

THE BENT

OF TAU BETA PI

The Engineering Honor Society

WINTER 2012



**2011 Convention
Good Guys, Wiseguys
Deluged by a Data Tsunami**



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the BENT of

Winter 2012
Vol. CIII / No. 1

*f*ounded at Lehigh University, South Bethlehem, Pennsylvania, June 15, 1885, by Edward H. Williams Jr., A.B., A.C., E.M., Sc.D., LL.D. (1849-1933). Key and name registered in U.S. Patent Office. Member, American Society for Engineering Education and (co-founder) Association of College Honor Societies. Affiliate, American Association for the Advancement of Science.

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ON THE COVER:

The 2011 Convention business concluded with the installation of Tau Beta Pi's fourth Secretary-Treasurer and second Executive Director—Curtis D. Gomulinski, who succeeded James D. Froula, P.E. (Ret.) (left).

Cover artist: Dali Polivka



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Editor: Curtis D. Gomulinski, MI E '01 Editorial Assistants: David S. Roberts and James D. Froula, P.E. (Ret.), TN A '67
Editorial Board: Dr. Lyle D. Feisel, P.E., IA A '61; Samuel C. Florman, P.E., NY A '44; and Dr. John W. Prados, P.E., TN A '54

THE BENT of Tau Beta Pi® (ISSN 0005-884X) is published quarterly for \$10 per year by The Tau Beta Pi Association, Inc., Room 508, Dougherty Hall, The University of Tennessee, Knoxville, Tennessee 37996-2215; www.tbp.org; FAX 865/546-4579; email: tbp@tbp.org. Life subscriptions are \$60. Printed in U.S.A. Periodicals postage paid at Knoxville, TN, and at additional mailing offices. SUBSCRIBERS and POSTMASTER: Send address change, request for online subs., & other correspondence to tbp@tbp.org or to: THE BENT of Tau Beta Pi / P.O. Box 2697 / Knoxville, TN 37901-2697. Telephone: 865/546-4578
Vol. 103 No. 1 Circulation: 88,000 Initiated Members: 526,459

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The Tau Beta Pi Association was founded at Lehigh University in 1885 by Edward Higginson Williams Jr. to mark in a fitting manner those who have conferred honor upon their Alma Mater by distinguished scholarship and exemplary character as students in engineering, or by their attainments as alumni in the field of engineering, and to foster a spirit of liberal culture in engineering colleges.
—Preamble to the Constitution

Time for Vision and Change

As those of you who share the “Boomer” generation designation with me might appreciate, the changes that we’ve seen since we were born are almost too numerous to count and are certainly life changing. When you think of the technological and communications advances alone that have occurred in our lifetimes, it is truly mind-boggling. No longer do we have to wait until late at night to make an affordable personal long-distance phone call. Incredibly, now you can make a computer-to-computer internet-based video call to almost anywhere in the world for free. Instead of our vinyl record collections or 8-track or cassette tapes, you can now carry your music and video libraries around in devices much smaller than that old cassette tape or even access your entire entertainment library with cloud computing.

While these remarkable changes in technology have been taking place, Tau Beta Pi has largely maintained its traditions. Many of our activities and traditions are cherished and should and will be preserved, although some should be scrutinized to see if they could be improved. In recent issues of THE BENT, you have seen articles about our Executive Director/Secretary-Treasurer transition. With the transition, this is the right time to examine our practices and to see where improvements can be made.

Our distinguished Vision Development Group, which was featured in the Fall 2011 issue of THE BENT, is looking at several of our programs and practices to see where change might create new opportunity. At the second group meeting, ideas were discussed about the annual Convention, District conferences, and the Engineering Futures Program, as well as starting new award recognition programs. Since many of the vision-development members have not recently been active in the Association, they are able to take a fresh and unbiased look at what we currently do and to think outside of the box to

make suggestions based on their vast experiences with other organizations.

The Vision Development Group also wants to know the needs of our current members. In the first phase of gathering information, we formed focus groups to capture the thoughts and ideas of the attendees at our 2011 Convention in Indianapolis about what they expect from Tau Beta Pi and how things could be improved. Additional focus groups are planned to gather more ideas from our large membership.



The Executive Council, as well as previous boards, recognizes that Tau Beta Pi has vast reserves of untapped potential. Through the work of the vision-development leaders and information gleaned from the focus groups, we plan to use that potential more fully for the betterment of our members, the engineering profession, and society at large.

We hope that as we implement changes recommended by the Vision Development Group, more of our 460,000 living members will find ways to participate with the Association. While change can sometimes be difficult and even frightening, it can also be a means toward growth and new opportunity. We hope that the changes we put into place will offer you an opportunity to reengage with Tau Beta Pi if you haven’t been active with us for a while, or to enjoy even more activities and benefits if you have remained active.

This is an exciting time of change for the Association, and we look forward to your participation in our future.

—Norman Pih, Tennessee Alpha '82, Councillor

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TBPI DISTINGUISHED ALUMNUS AWARD

Each year the Association recognizes up to five TBPI alumni with outstanding accomplishments in engineering and who have demonstrated integrity, breadth of interest, adaptability, and unselfish activity (as cited in our Eligibility Code) and have fostered a spirit of liberal culture in areas such as (but not limited to) athletics, community service, and fine arts on local, national, and/or international scales. Their personal qualities of excellence and leadership should serve as examples to influence the careers and lives of TBPI collegiate members.

Any TBPI member or chapter may nominate one or more alumnus member(s), except a national official. A nomination in digital format must be sent by February 1 to the Executive Director by mail or to tbp@tbp.org by email.

The nomination and documentation must include two references and the name, contact information, TBPI chapter, bio or CV, and a summary of the nominee's lifetime contributions and activities emphasizing their impact on liberal culture. The nomination form is available at www.tbp.org under *Programs*.

After review and screening, the Selection Committee will contact each nominee with a record of contributions in harmony with the objectives of the award.

Awardees are introduced at the Convention each fall, and a TBPI Scholarship is named in honor of each individual the following spring.

TBPI MCDONALD MENTOR AWARD

Marion and Capers W. (*North Carolina Gamma '74*) McDonald and TBPI established an award to celebrate excellence in mentoring and advising among TBPI educators and engineers. The honor recognizes those who have consistently supported the personal and professional development of their students and colleagues through mentorship.

As engineering educators or as professionals in industry, government, or service organizations, these TBPI mentors contribute to our engineering community in many ways, serving as effective advocates and guides in both professional and administrative matters. They show true concern for individuals, support an environment for developing talents, and have earned respect and recognition for their contributions to their field and to the greater community.

Recipients of the TBPI-McDonald Mentor Award are presented a special medallion and a \$2,000 cash award (\$1,000 to honoree and \$1,000 to a chapter). Any chapter or member may nominate any alumnus member(s). The following brief material in digital format must arrive at Headquarters by April 1:

- 1) A one-page summary of achievements and/or contributions exemplifying the objective of the award.
- 2) Two letters of reference from persons other than the nominating party or sponsoring chapter president who are familiar with the nominee's contributions and achievements, such as a dean or supervising personnel.



EDITORIAL

Fellows in Tau Beta Pi

greetings! The most common question asked of me since accepting my new position is, “How do you pronounce Gomulinski?” I will undoubtedly be asked many more times, but, for the record, it is pronounced *GO-MULL-IN-SKI*. I assumed the responsibilities of Executive Director, Secretary-Treasurer, and Editor from Jim Froula at the conclusion of the 2011 Convention in Indianapolis on October 29. Jim and I have spent the last four months working hand-in-hand to transition the many responsibilities of this position. His help, wisdom, and advice have been invaluable, and I look forward to “picking his brain” through the end of January when he concludes his full-time employment.

As others have pointed out, I am only the fourth person to serve in this position. When President Simonson called me this past May to inform me that I had been selected to succeed Jim, I was simultaneously excited (the jumping-up-and-down variety), humbled, and anxious. How does one follow the legacy left by fellow Tau Bates R.C. Matthews, R.H. Nagel, and J.D. Froula? Simply put, I will do my very best to continue the tradition of excellence set by my predecessors using my skills, experience, and enthusiasm. This is by no means a small undertaking, but with the support of the Headquarters staff, national volunteers, chapter officers, and my fellows in Tau Beta Pi, I know we can advance our organization to an even higher standing!

The enthusiasm and excitement exhibited by the attendees at this year’s Convention reminded me of my own early involvement and why I stayed involved. When I was an undergraduate, Wayne State was a commuter campus. As a freshman and sophomore, I went to school,

attended classes, and went home. Such was my life until Tau Beta Pi appeared during my junior year. In our Society, I found an organization dedicated to the principles that aligned perfectly with my own, and I immersed myself in a variety of volunteer activities. Since initiation 13 years ago, there have been only seven weeks when I haven’t been a chapter officer, national official, or, now, an employee. I am both passionate and excited about the future of our Association.

During the Thanksgiving holiday, my wife and I traveled back home to Michigan and South Dakota to visit with family and friends. One afternoon, I was struck that six of the eight of us around the lunch table were Tau Bates. Let me offer another example: my two (one in Colorado and one in Michigan) wedding receptions last year. My wife Tricia, who is also an active volunteer, and I were joined by over 30 friends affiliated with the Society. Pictures of the members who were able to share in our special occasion are included below. Involvement in Tau Beta Pi can truly provide lifelong friendships and an invaluable network of professional colleagues.

As we move into the new year, I encourage our student members to remain enthusiastic and excited about this outstanding organization. My own devotion to and passion for the Society have brought me to a place I only dreamed about a few short years ago. The attendees at Convention challenged us to identify more opportunities for alumnus and alumna involvement, and we will do just that. Your assistance in identifying meaningful opportunities for participation is most welcome.

Your most humble fellow,



Michigan—Back Row (L-R): Kris Kolevar, Richard Robben, Greg Schroeder, Andrew Flowerday, Natalie Griffith, Christopher Burtka, Barry Frost, Craig Elder, Lonnie Snyder, Steve Stramsak, Ronnie Snyder, Colleen Hill-Stramsak, Stacey Forkner, Rebecca Davis, and Chris Davis.



Colorado—Ken Siegenthaler, Jeff Watson, Bill Barnhart, Sandy Pitzak, Jason Latimer, Ashley Y. Begley, Tom Begley, Tricia, Mike Gudysh, Curt, Lonnie Snyder, Larry Simonson, Ronnie Snyder, Randy Richmond, John Zerwekh, Rebecca Walter, and Jay Masterson.



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TBP's website is continuously improved to help you find your classmates, current events, awards, announcements, & member benefits. Staying connected to Tau Beta Pi is easier than ever.

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2012 DISTRICT CONFERENCES

THE DISTRICT PROGRAM provides a vital link between the Association and individual chapters. Each spring the Directors meet with students at regional conferences to provide both retiring and new officers opportunities to improve chapter operations and to socialize. **Interested alumni are encouraged to attend**, but should email tbp@tbp.org for details. All chapters are urged to elect new officers before their District conference.

DISTRICT	LOCATION	DATE
1	Medford, MA	Mar. 31
2	New York City, NY	Feb. 11-12
3	Philadelphia, PA	Feb. 10-11
4	Annapolis, MD	Mar. 31
5	Greenville, SC	Feb. 25
6	Lexington, KY	Mar. 24
7	Cleveland, OH	Mar. 31
8	Milwaukee, WI	Apr. 21
9	Rolla, MO	Mar. 3
10	Austin, TX	Mar. 24
11	Minneapolis, MN	Mar. 31
12	Fort Collins, CO	Feb. 24-25
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14	Seattle, WA	Mar. 3
15	Stockton, CA	Mar. 17
16	Claremont, CA	Apr. 14



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WHO'S WHO

Yvonne C. Brill, *South Carolina Gamma '45*, was chosen by the White



House to receive the National Medal of Technology and Innovation. Brill, who had a long career with aerospace and satellite companies including RCA Astroelectronics and Inmarsat, was recognized "for innovation in rocket propulsion systems for geosynchronous and low-earth-orbit communication satellites."

Virginia M. Rometty, *Illinois Gamma '79*, has been named president and chief executive officer of IBM, effective January 1. She was also elected to the board of directors. Rometty, currently senior vice president and group executive for sales, joined the firm in 1981 as a systems engineer.



Lisa Perez Jackson, *Louisiana Beta '83*, is now administrator of the Environmental Protection Agency. Previously, she worked at the New Jersey department of environmental protection for six years as an assistant commissioner and then as commissioner. Prior to that, she was at the EPA for 16 years.



Dr. Jack R. Lohmann, *Oklahoma Gamma '74*, is editor of the ASEE's *Journal of Engineering Education* and has received the 2011 global award for excellence in engineering education from the International Federation of Engineering Education Societies. Dr. Lohmann is vice

provost for faculty and academic development and a professor at the Georgia Institute of Technology.

Carl D. Sparks, *New Jersey Delta '89*, has become president and CEO of Travelocity Global, overseeing a portfolio of travel brands. He was president of online fashion and travel retailers Gilt Groupe. Sparks previously was general manager of Hotels.com and chief marketing officer at Expedia.



Christopher M. Stone, P.E., *Virginia Delta '78*, has been installed as the 2011-12 president of the NSPE. He is president of Virginia architecture, engineering, and interior design firm Clark Nexsen PC. Active in the society since 1989, he served on the legislative and governmental affairs, membership, and other committees.



Capt. Gregory A. McWherter, *South Carolina Gamma, '90*, is serving a second tour as flight leader/commanding officer of the U.S. Navy's navy flight demonstration squadron, known as the Blue Angels. The Persian Gulf veteran is a former Topgun instructor.



IEEE Honors

Four Tau Bates were honored at the IEEE annual awards ceremony:

•**Dr. Toby Berger**, *CT A '62*, pioneering information theorist, received the Richard W. Hamming medal.

•**Dr. James F. Gibbons**, *IL Γ '53*, a leader of university-industry collaboration, received the Founders medal.

•**James M. Headrick**, *TX A '39*, an innovator of advanced radar systems, received the Dennis J. Picard medal for radar technologies and applications, posthumously. He passed away in February, 2011.

•**Bernard J. Lechner**, *NY A '57*, a pioneer of flat-panel display technology, received the Jun-ichi Nishizawa medal jointly with two others.

Institute of Medicine

The Institute of Medicine of the National Academies named four Tau Bates among 65 new members:

•**Dr. Mark E. Davis**, *KY A '77*, professor of chemical engineering, California Institute of Technology, Pasadena.

•**Dr. Joe W. Gray**, *CO A '68*, professor of biomedical engineering, and director, center for spatial systems biomedicine, Knight Cancer Institute, Oregon Health and Science University, Portland.

•**Dr. Michael L. LeFevre**, *MO A '75*, professor and vice chair, department of family and community medicine, school of medicine, and chief medical information officer, University of Missouri Health Care, Columbia.

•**Dr. Barbara G. Vickrey**, *TN B '80*, professor and vice chair, department of neurology, school of medicine, University of California, Los Angeles.

Joseph F. Sutter, *Washington Alpha '43*, was honored on his 90th birthday by Boeing which



named the main engineering building for its commercial airplanes division at Everett, WA, the Joe Sutter Engineering Building.

The veteran aircraft engineer was chief engineer of the 747 design team.

2012 GRADUATE FELLOWSHIPS

Tau Beta Pi's 79th annual program of fellowships for graduate study in the 2012-13 academic year will close January 31, 2012, when applications must be postmarked and sent to Director of Fellowships D. Stephen Pierre Jr., P.E.

Approximately 18 cash awards will be given, each worth \$10,000, made on the promise of future development in engineering or related fields, and financial need. Winners will be selected by the Fellowship Board and notified in April.

All members of Tau Beta Pi are eligible to apply. Students and alumni should apply online at www.tbp.org.

192 TBPI SCHOLARSHIPS

The TBPI Association Scholarship Program for senior-year study during the 2012-13 academic year will close March 1, 2012. Selection will be made on the basis of high scholarship, recommendations, extracurricular activities, and financial need. Junior members of TBPI who will be graduating seniors in 2012-13 are eligible to apply at www.tbp.org. Winners will be notified in April.

EDUCATIONAL LOAN FUND

Since 1935, TBPI has assisted student members with their financial needs while in school or with payment of their initiation fee through our Student Loan Fund. We are pleased to offer this service for students in amounts up to \$2,500 per member. Repayment is required after three years, and a simple interest rate of six percent is charged from the day the loan is received. Interested students can obtain promissory notes and applications from tbp.org.

TWO CHAPTER PETITIONS TO 2012 CONVENTION

Two petitions for collegiate chapters of Tau Beta Pi have been received and will be presented in September to the 2012 Convention in Lexington, KY.

The Tau Beta Nu Engineering Honor Society has operated at **Penn State Erie, The Behrend College** since 2008, when its first members joined. This group submitted a preliminary petition for a new chapter in August 2010. It was approved by the Executive Council for an inspection, and a committee of four national officials and representatives of three neighboring chapters visited in September 2011. The committee recommended granting a charter to the petitioning group after the implementation of improvements in operations.

The institution was established in 1948 on land given to the Penn State system and has grown steadily since 1960. The 864-acre residential campus has 4,700 undergraduates and graduate students in more than 40 programs in four schools—business, engineering, humanities and social sciences, and science. Students may begin study at any

Penn State campus and may finish at any Penn State college. Honor societies include Sigma Xi and Tau Alpha Pi.

The school of engineering has 750 undergraduates in four engineering programs and 530 students in technology programs. Many undergraduates are involved in research, and students perform well in national competitions. Computer, electrical, mechanical, and software engineering are ABET/EAC accredited. The school has grown steadily for six years and provides strong support to students. In 2010-11, the school awarded 91 engineering degrees.

The **College of New Jersey** Engineering Honor Society was established on campus in Fall 2009 and submitted a preliminary petition for a new chapter in June 2011. The Executive Council approved an inspection, and a committee of four national officials and student and faculty representatives from two nearby chapters visited in September 2011. The committee recommended granting a charter to the petitioning group after the implementation of improvements in operations.

NJIT was founded in 1855 as a normal school and has grown to include seven schools—arts and communication; business; education; engineering; humanities & social sciences; science; and nursing, health, & exercise science. The 289 tree-lined acre suburban campus has 6,500 undergraduates (6,200 full time). Honor societies include Phi Kappa Phi and Phi Beta Kappa.

The school of engineering granted its first degree in 1994 and has 550 undergraduates in six engineering programs and 150 students in a technological studies program. Civil, computer, electrical, engineering science, and mechanical engineering are ABET/EAC accredited, and biomedical engineering offers a bachelor's of arts. All engineering students are required to take the fundamentals of engineering examination. The school has grown steadily during the past decade and awarded 66 engineering degrees in 2009-10.

The petitions have the support of the administrative officials and faculty of the institutions and will go to the 2012 Convention with Council approval.

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LETTERS

An Engineer's Alphabet

• The letter *L* in Dr. Henry Petroski's alphabet [Fall 2011], needs more clarification because liberal arts has been erroneously defined over the years. The real origin of the liberal arts is as stated below:

Originally, Plato had philosophy (the natural sciences)—comprised of ethics, logic, and physics—and he stated that mathematics was the prerequisite to the study of philosophy, hence the establishment of the academy in Athens.

But Aristotle, despising mathematics, substituted physics with meta-physics, and degraded logic to speculative reasoning.

When the Arab Muslims revitalized Plato's philosophy, they introduced the "Seven Streams of Wisdom," comprising: (1) oratory, (2) grammar, (3) logic, (4) arithmetic, (5) geometry, (6) music, and (7) astronomy.

The medieval institutions renamed the seven streams "The Seven Liberal Arts," with two levels; the lower level comprising oratory, grammar and logic as the trivium; and the upper level comprising physics—arithmetic, geometry, music, and astronomy—as the quadrivium.

As stated by Dr. Petroski, the undergraduate engineering degree is the liberal education of the 21st Century. It is obvious from the above definition of liberal arts that engineers are true liberal artists because, for the engineer to advance to the subjects of the quadrivium, one should have first mastered oratory, grammar, and logic; that is, have mastered all the *three Rs*—the foundations to advanced learning. The modern liberal arts students, on the other hand, are half-educated in the real liberal arts because they have mastered only reading and writing

and need to return to learn arithmetic, the most important *R*, for the 21st Century.

The engineering student can always pick up any book on the so-called liberal arts courses, and educate him/her self on those subjects. The modern liberal arts students should go back and complete their liberal arts studies, because they have only accomplished the lower part of the original liberal arts.

Ibrahim A. Ashie, DC Γ'70

• I very much enjoyed the excerpts from "An Engineer's Alphabet." I especially appreciated the entries on *badges of engineering societies* and *keys of honor societies*. The photo caught my eye as I also have both a Tau Beta Pi Bent and a Phi Beta Kappa key. In the midst of the interview process before starting my career, I often debated about which I should wear to interviews and events, as I am equally proud of both. I would be interested to learn how many dual members we have in the Society.

Alice Fay Keene, IA A '05

Aggressive Engineering for Passive Houses

• Trudy E. Bell's article [Summer 2011] contained some useful technical information on state-of-the-art practices to design and build energy efficient homes, but it lacked the information that most engineers and homeowners would consider to be essential in considering various home energy usage reduction options, and that is the financial payback of the various examples she cited in the article versus current conventional home construction. For example, what would it cost to build the 3,000 ft² PNC Smart Home, or the 1,800 ft² Yellow Springs, OH, house, what would be the annual energy usage reduction of these houses, and what would be the payback period for the additional cost of these aggressively engineered passive homes at various

energy unit costs and discount rates on the additional investment?

On the first page of the article, Ms. Bell started to discuss total cost of home ownership, but unfortunately did not provide a complete total cost of home ownership analysis. I am surprised that the editor of THE BENT did not require such an analysis on at least one example provided in the article before publishing it.

Vito Cedro III, PA Γ'70

World Trade Center Asbestos

• The identity of the person for whom James S. Dukelow Jr. was so assiduously searching the recent Spring 2010 issue of THE BENT is not that of his circuitously-identified "right-wing activist, with a B.A. in natural science, master's in biostatistics, and law degrees from the University of Baltimore and Georgetown University," but rather is Herbert Levine, inventor and patent-holder of the spray-on, asbestos-slurry process that was used on the lower two-thirds of both towers of the World Trade Center. Unfortunately, for the rest of the way to the top, New York officials blanched, terror-stricken in the presence of unconfined asbestos and thereafter groveled before the *Greens*, banning the further use of asbestos in the construction.

Mr. Levine made his charge repeatedly in the 1970s—decades before the towers were attacked—that "If a fire breaks out above the 64th floor; that building [either of the towers] will fall down."

Competence generates pre-science. His prediction was devastatingly realized on September 2001, when Muslim terrorists rammed the towers with hijacked jetliners. Once again the blinkered vision of the *Greens* brought forth tragedy. Their substitute method failed to retard sufficiently the heating of the iron, the immediate structure buckled, and 90 minutes after the hit, a cas-



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cade of concrete and iron fell to the ground. Absent the four-hour *grace period* provided by the original asbestos barrier, thousands died before they could walk away.

Just viewing the televised horror was debilitating, but those images will pale into petty bumps and scratches if the Greens deprive us of our energy infrastructure. Modern, post-Renaissance civilizations require extensive use of energy, and a *Green* reduction thereof will push us back to the early 1900s and will result in a massive die-off of Americans.

William O. Felsman Jr., OH A '50

Scholarship Program

- It has been an honor to be a member of *our* Association. Being selected for a scholarship has been an immense privilege. This award has helped me pay various expenses, including tuition, rent, and books.

Thank you so much for providing stipends to students like me to alleviate the many expenses associated with attending college. I really appreciate your help.

Mary Ann Rougeau, MS A '12

- I feel so fortunate to have been chosen as a recipient of the Record Scholarship. Thank you so much for your generosity in funding it. I am a senior in civil engineering at California State University, Sacramento.

This award will help fund the remainder of my education and has allowed me to maximize my time on campus. It has not been easy to juggle work and school, and I am truly grateful for the assistance that I am receiving because of you. In the coming year, I plan to follow my dreams of furthering my education and pursue a master's degree focusing on geotechnical engineering. I am also in the process of becoming a United States Air Force officer candidate, in hopes that upon completion of the master's program I can be commissioned as an active duty officer.

Ashley L. Moran, CA Y '12

THE BENT

- Today I submitted payment for a lifetime subscription to THE BENT! It's always great to read. Keep up the good work.

Daniel A. Kucz, PA E '07

Statement of Ownership, Management & Circulation

Date of filing: September 15, 2011

THE BENT of Tau Beta Pi, ISSN 0005-884X, is published quarterly by The Tau Beta Pi Association, Inc., 508 Dougherty Engineering Building, University of Tennessee, Knoxville, TN 37996-2215. The annual subscription price is \$10.00. Editor is James D. Froula, P.E., P.O. Box 2697, Knoxville, TN 37901-2697.

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	Average No. Copies Each Issue Preceding 12 Months	Actual No. Copies Single Issue Nearest to Filing Date
Total No. copies printed (net press run)	88,946	89,073
Paid mail circulation	86,991	87,331
Sales through dealers and counter sales	0	0
Free distribution by mail (samples, complimentary)	1,256	1,255
Total distribution	88,247	88,586
Copies not distributed	699	487
Total	88,946	89,073

I certify that the statements made above are correct and complete.

—James D. Froula, P.E., Editor

CHAPTERS

ALUMNUS CHAPTERS

District 1 • *denotes active chapter*
 Central Connecticut, Hartford

District 2
 Buffalo, NY
 Long Island Suburban, NY
 Newark, NJ
 New York, NY

• Rochester, NY
 Schenectady, NY
 • Southern Tier, Binghamton, NY

District 3
 Lehigh Valley, Bethlehem, PA
 • Philadelphia, PA—New, established June 2010.
 Wilmington, DE

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 Hampton Roads, Newport News, VA
 Kanawha Valley, Charleston, WV
 Research Triangle, Durham-Chapel Hill-Raleigh, NC
 Richmond, VA

• Washington, DC

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 Gainesville, FL
 Miami, FL
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 Puerto Rico
 Tampa Bay, FL
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 Central Michigan, Lansing

Cincinnati, OH
 Dayton, OH
 • Southeastern Michigan, Detroit
 Flint, MI
 • Grand Rapids, MI
 • Ohio's North Coast, Cleveland
 Columbus, OH

District 8
 Chicago Area, IL

• Central Illinois, Urbana-Champaign
 Milwaukee, WI

District 9
 Rolla, MO

St. Louis, MO

District 10
 • Houston, TX

District 11
 Ames, IA

• Minnesota, Twin Cities, MN

District 12
 • Front Range, CO/WY

Salt Lake City, UT

District 13
 El Paso, TX

Phoenix, AZ

Sun City, AZ

District 14
 Columbia River Basin, Richland, WA

Portland, OR

• Puget Sound, Seattle, WA

District 15
 • Sacramento, CA

• San Francisco Bay Area, CA

San Francisco Peninsula, Palo Alto, CA

District 16
 Southern California, Los Angeles

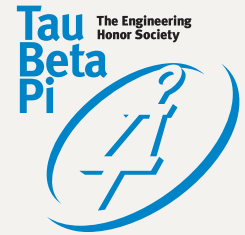
CA Σ	16	Univ. of California, Santa Barbara
CA T	16	Univ. of California, Irvine
CA Y	15	California State Univ., Sacramento
CA Φ	15	Univ. of the Pacific
CA X	16	California State Univ., Fullerton
CA Ψ	16	Univ. of California, San Diego
CA Ω	16	Harvey Mudd College
CA AA	15	California State Univ., Chico
CA AB	16	Univ. of California, Riverside
CA AF	15	San Francisco State Univ.
CA AA	15	Univ. of California, Santa Cruz
CO A	12	Colorado School of Mines
CO B	12	Univ. of Colorado at Boulder
CO Γ	12	Univ. of Denver (inactive)
CO Δ	12	Colorado State Univ.
CO E	12	Univ. of Colorado at Denver
CO Z	12	United States Air Force Academy
CT A	1	Yale Univ.
CT B	1	Univ. of Connecticut
CT Γ	1	Univ. of Hartford
DE A	3	Univ. of Delaware
DC A	4	Howard Univ.
DC B	4	Catholic Univ. of America
DC Γ	4	George Washington Univ.
FL A	5	Univ. of Florida
FL B	5	Univ. of Miami
FL Γ	5	Univ. of South Florida
FL Δ	5	Univ. of Central Florida
FL E	5	Florida Atlantic Univ.
FL Z	5	Florida Inst. of Technology
FL H	5	Florida A&M Univ.-Florida State Univ.
FL Θ	5	Florida International Univ.
FL I	5	Embry-Riddle Aeronautical Univ.
GA A	5	Georgia Inst. of Technology
GA B	5	Mercer Univ.
ID A	14	Univ. of Idaho
ID B	12	Idaho State Univ.
ID Γ	12	Boise State Univ.
IL A	8	Univ. of Illinois at Urbana-Champaign
IL B	8	Illinois Inst. of Technology
IL Γ	8	Northwestern Univ.
IL Δ	8	Bradley Univ.
IL E	8	Southern Illinois Univ. at Carbondale
IL Z	8	Univ. of Illinois at Chicago
IN A	8	Purdue Univ.
IN B	8	Rose-Hulman Inst. of Technology
IN Γ	8	Univ. of Notre Dame
IN Δ	8	Valparaiso Univ.
IN E	8	Trine Univ.
IA A	11	Iowa State Univ.
IA B	11	Univ. of Iowa
KS A	9	Univ. of Kansas
KS B	9	Wichita State Univ.
KS Γ	9	Kansas State Univ.
KY A	6	Univ. of Kentucky
KY B	6	Univ. of Louisville
KY Γ	6	Western Kentucky Univ.
LA A	10	Louisiana State Univ.
LA B	10	Tulane Univ. of Louisiana
LA Γ	10	Louisiana Tech Univ.
LA Δ	10	Univ. of Louisiana at Lafayette
LA E	10	Univ. of New Orleans
ME A	1	Univ. of Maine
MD A	4	Johns Hopkins Univ.
MD B	4	Univ. of Maryland
MD Γ	4	United States Naval Academy
MD Δ	4	Univ. of Maryland Baltimore County
MD E	4	Morgan State Univ.
MA A	1	Worcester Polytechnic Inst.
MA B	1	Massachusetts Inst. of Technology
MA Γ	1	Harvard Univ. (inactive)
MA Δ	1	Tufts Univ.
MA E	1	Northeastern Univ.
MA Z	1	Univ. of Massachusetts at Amherst
MA H	1	Boston Univ.
MA Θ	1	Univ. of Massachusetts Lowell
MA I	1	Western New England Univ.
MI A	7	Michigan State Univ.
MI B	11	Michigan Tech. Univ.
MI Γ	7	Univ. of Michigan
MI Δ	7	Univ. of Detroit Mercy
MI E	7	Wayne State Univ.
MI Z	7	Kettering Univ.
MI H	7	Lawrence Technological Univ.
MI Θ	7	Oakland Univ.
MI I	7	Univ. of Michigan-Dearborn
MI K	7	Western Michigan Univ.
MI A	7	Grand Valley State Univ.
MN A	11	Univ. of Minnesota-Twin Cities
MN B	11	Univ. of Minnesota, Duluth
MS A	6	Mississippi State Univ.
MS B	6	Univ. of Mississippi
MO A	9	Univ. of Missouri-Columbia
MO B	9	Missouri Univ. of Science & Technology
MO Γ	9	Washington Univ.
MO Δ	9	Univ. of Missouri-Kansas City
MT A	12	Montana State Univ.
MT B	12	Montana Tech of the Univ. of Montana
NE A	9	Univ. of Nebraska-Lincoln
NV A	15	Univ. of Nevada, Reno
NV B	16	Univ. of Nevada, Las Vegas
NH A	1	Univ. of New Hampshire
NH B	1	Dartmouth College
NJ A	2	Stevens Inst. of Technology
NJ B	2	Rutgers Univ.
NJ Γ	2	New Jersey Inst. of Technology
NJ Δ	2	Princeton Univ.
NJ E	2	Rowan Univ.

NM A	13	New Mexico State Univ.
NM B	13	Univ. of New Mexico
NM Γ	13	New Mexico Inst. of Mining & Tech.
NY A	2	Columbia Univ.
NY B	2	Syracuse Univ.
NY Γ	2	Rensselaer Polytechnic Inst.
NY Δ	2	Cornell Univ.
NY E	2	New York Univ. (inactive)
NY Z	2	Polytechnic Inst. of Brooklyn (inactive)
NY H	2	City College of CUNY
NY Θ	2	Clarkson Univ.
NY I	2	Cooper Union School of Engineering
NY K	2	Univ. of Rochester
NY Λ	2	Pratt Inst. (inactive)
NY M	2	Union College
NY N	2	SUNY at Buffalo
NY E	2	Manhattan College
NY O	2	SUNY at Stony Brook
NY Π	2	Rochester Inst. of Technology
NY P	2	Polytechnic Institute of New York Univ.
NY E	2	Alfred Univ.
NY T	2	Binghamton University
NY Y	2	United States Military Academy
NC A	4	North Carolina State Univ. at Raleigh
NC B	4	Univ. of N.C. at Chapel Hill (inactive)
NC Γ	4	Duke Univ.
NC Δ	4	Univ. of North Carolina at Charlotte
NC E	4	North Carolina A&T State Univ.
ND A	11	North Dakota State Univ.
ND B	11	Univ. of North Dakota
OH A	7	Case Western Reserve Univ.
OH B	7	Univ. of Cincinnati
OH Γ	7	Ohio State Univ.
OH Δ	7	Ohio Univ.
OH E	7	Cleveland State Univ.
OH Z	7	Univ. of Toledo
OH H	7	Air Force Inst. of Technology
OH Θ	7	Univ. of Dayton
OH I	7	Ohio Northern Univ.
OH K	7	Univ. of Akron
OH A	7	Youngstown State Univ.
OH M	7	Wright State Univ.
OH N	7	Cedarville Univ.
OH E	7	Miami Univ.
OK A	9	Univ. of Oklahoma
OK B	9	Univ. of Tulsa
OK Γ	9	Oklahoma State Univ.
OR A	14	Oregon State Univ.
OR B	14	Portland State Univ.
OR Γ	14	Univ. of Portland
PA A	3	Lehigh Univ.
PA B	3	Pennsylvania State Univ.
PA Γ	3	Carnegie Mellon Univ.
PA Δ	3	Univ. of Pennsylvania
PA E	3	Lafayette College
PA Z	3	Drexel Univ.
PA H	3	Bucknell Univ.
PA Θ	3	Villanova Univ.
PA I	3	Widener Univ.
PA K	3	Swarthmore College
PA A	3	Univ. of Pittsburgh
PR A	5	Univ. of Puerto Rico
RI A	1	Brown Univ.
RI B	1	Univ. of Rhode Island
SC A	5	Clemson Univ.
SC B	5	Univ. of South Carolina
SC Γ	5	The Citadel
SD A	12	South Dakota School of Mines & Tech.
SD B	11	South Dakota State Univ.
TN A	6	Univ. of Tennessee
TN B	6	Vanderbilt Univ.
TN Γ	6	Tennessee Tech. Univ.
TN Δ	6	Christian Brothers Univ.
TN E	6	Univ. of Memphis
TN Z	6	Univ. of Tennessee at Chattanooga
TX A	10	Univ. of Texas at Austin
TX B	13	Texas Tech Univ.
TX Γ	10	Rice Univ.
TX Δ	10	Texas A & M Univ.
TX E	10	Univ. of Houston
TX Z	10	Lamar Univ.
TX H	10	Univ. of Texas at Arlington
TX Θ	13	Univ. of Texas at El Paso
TX I	13	Southern Methodist Univ.
TX K	10	Prairie View A & M Univ.
TX A	10	Texas A & M Univ.-Kingsville
TX M	10	Univ. of Texas at San Antonio
UT A	12	Univ. of Utah
UT B	12	Brigham Young Univ.
UT Γ	12	Utah State Univ.
VT A	1	Univ. of Vermont
VT B	1	Norwich Univ.
VA A	4	Univ. of Virginia
VA B	4	Virginia Polytechnic Inst. & State Univ.
VA Γ	4	Old Dominion Univ.
VA Δ	4	Virginia Military Inst.
VA E	4	Virginia Commonwealth Univ.
WA A	14	Univ. of Washington
WA B	14	Washington State Univ.
WA Γ	14	Seattle Univ.
WA Δ	14	Gonzaga Univ.
WV A	4	West Virginia Univ.
WV B	4	West Virginia Univ. Inst. of Technology
WI A	8	Univ. of Wisconsin-Madison
WI B	8	Marquette Univ.
WI Γ	8	Univ. of Wisconsin-Milwaukee
WI Δ	8	Milwaukee School of Engineering
WI E	8	Univ. of Wisconsin-Platteville
WY A	12	Univ. of Wyoming

COLLEGIATE CHAPTERS (244)

Chap. Dist.	Institution
AL A	6 Auburn Univ.
AL B	6 Univ. of Alabama
AL Γ	6 Univ. of Ala. at Birmingham
AL Δ	6 Univ. of Ala. in Huntsville
AL E	6 Univ. of South Alabama
AK A	14 Univ. of Alaska Fairbanks
AZ A	13 Univ. of Arizona
AZ B	13 Arizona State Univ.
AZ Γ	13 Northern Arizona Univ.
AR A	9 Univ. of Arkansas
CA A	15 Univ. of California, Berkeley
CA B	16 California Inst. of Technology
CA Γ	15 Stanford Univ.
CA Δ	16 Univ. of Southern California
CA E	16 Univ. of California, Los Angeles
CA Z	15 Santa Clara Univ.
CA H	15 San Jose State Univ.
CA Θ	16 California State Univ., Long Beach
CA I	16 California State Univ., Los Angeles
CA K	16 California State Univ., Northridge
CA A	15 Univ. of California, Davis
CA M	15 Calif. Poly. St. Univ., San Luis Obispo
CAN A	16 California State Poly. Univ., Pomona
CA E	16 San Diego State Univ.
CA O	16 Loyola Marymount Univ.
CA Π	16 Northrop Univ. (inactive)
CA P	15 California State Univ., Fresno

To start something...
you just need a trailer...
a great idea...
and your own winning team...



YAHOO! was started in a Stanford University campus trailer in 1994 by Chih-Yuan "Jerry" Yang, *California Gamma '90*, left, and David R. Filo, *Louisiana Beta '88*, who were electrical engineering graduate students when they created a website named "Jerry and David's Guide to the World Wide Web." This was a directory of other websites, organized in a hierarchy, as opposed to a searchable index of pages. In April 1994, "Jerry and David's Guide to the World Wide Web" was renamed "Yahoo!" The rest is history. They worked together and with others to build a team. This became a multinational corporation with more than 14,000 employees and 2011 total equity of \$12.53 billion.

Tau Beta Pi's Engineering Futures Program teaches students the special skills needed to create and run such effective teams, like resolving interpersonal problems, conducting effective meetings, and presenting results to stakeholders. Your chapter can schedule an Engineering Futures session by contacting sherry@tbp.org.

TBPi Engineering Futures
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LYLE'S LAWS

The Limits of Logic

My first engineering job was a summer internship at Collins Radio Company in Cedar Rapids, IA. It was a great experience, and I have long said that I learned more engineering in those three months than in any other 12-month period of my career. I worked for and with engineers and technicians who had been with the company for years and were very solid, both in their engineering fundamentals and in their dedication to their company and to their craft.

My assignment for the summer was to design and deliver a production test unit for a major component of a flight-control system. In that short period of time, I had to learn the operation of the system, understand the parameters that had to be tested, work with other engineers to develop the test procedures and tolerances, and, finally, design the test circuits. But it didn't end there; then I had to design the panel itself, choose the components, and get the whole thing fabricated and tested before I walked out the door. Can you see why I learned so much engineering?

What did I learn? I could write a thousand words to answer that, but I want to concentrate on a revelation that came very near the end of my tenure when I proudly showed the finished product to my supervisor. It was a rack mounted panel full of meters, lights, switches, and knobs, and it worked perfectly when I demonstrated it. When I was all finished with the demonstration, my supervisor complimented me and then asked, "Why did you choose those knobs?" Well, I guess I hadn't given much thought to the knobs, but they looked sturdy, they were easy to grasp, and they weren't very expensive. What's not to like? The boss then said, "Those are the ugliest knobs I've ever seen."

Wait a minute, I said (to myself). Sturdy. Easy to grasp. Cheap. What does *ugly* have to do with it? Well, as I thought about it, I had to admit that the knobs were not the most attractive. But still, simple logic would dictate I should use those knobs. And then it occurred to me—well, not then, but over the years—that engineering is not just pure logic. Good engineering does certainly employ logic, but it also must, at times, involve feelings or emotions, intuition, a sense of beauty, esthetics—a whole host of non-logic

cal parameters. Thence, Lyle's Law of the Limits of Logic: *Think, but also feel.*

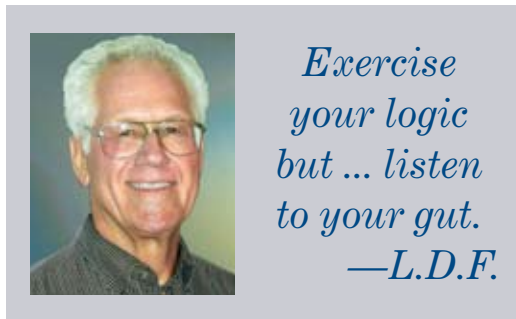
Countless words have been written—and probably even more have been spoken—about the tension between logic and feelings in the leading of our lives. It would seem that we listen to both: some of us more to one, some more to the other. Logic rules in one case, feelings in another. I trust that very few people consider themselves 100 percent logical. After all, we still beget children even though we know—if we think about it—that they will seriously restrict our activities for about two decades and also cost us a bunch of money. But, while we may lose money on the logic side, we are richly rewarded on the emotional.

It is less apparent, I think, that such logical ambivalence should extend to the practice of engineering as asserted by the Law of the Limits of Logic. But consider the *non-logical* phenomenon we call intuition. I suspect that we have all had the experience of solving a problem or working out a design or somehow reaching a conclusion and then stepping back and saying, "That

just doesn't look right." No reason. Or at least no reason that we can put our finger on. But further reflection will often show that there really is something wrong or at least that something could be better.

What is this thing called intuition, and how does it work? I don't know. Certainly it involves—or at least is informed by—experience, but it seems to go beyond that. Whatever it is and however it works, we are well advised to heed it. Many an error has been uncovered, and many an improvement has been engendered by intuition.

Another non-logical phenomenon is emotion, broadly defined as a mental state arrived at through feelings rather than reasoning or cognition. I ran across an interesting quote from Isaac Bashevis Singer, the 20th century Polish-American author who won the Nobel prize in literature in 1978. Singer wrote, "The very essence of literature is the war between emotion and intellect," That may be true in literature, but I suspect that in engineering, the war is over—and intellect won. The vanquished, however, should not be purged or exiled. We need to integrate emotion into our post-war culture and listen to it from time to time.



My old boss didn't go through any reasoning process to arrive at the conclusion that those knobs were ugly. Looking at the knobs elicited in him a feeling or a reaction that was unpleasant, and he knew he would feel better if he were looking at a different knob. Logically, the choice of knobs really didn't make any difference. Esthetically, emotionally, it did. It does. In our professional activities and in living our lives, it is our emotions that lead us to consider such things as beauty, ethics, justice, and love. To ignore those considerations will diminish our profession and our lives.

Another quote I like is from Rabin-dranath Tagore, an Indian poet and another Nobel prize winner: "A mind all logic is like a knife all blade. It makes the hand bleed that uses it. ..." Ouch.

While the Law of the Limits of Logic advises paying attention to non-logical phenomena, it does not condone the use or even existence of what might be called the *anti-logical*. By anti-logical, I mean the know-nothing rejection of science and scientific knowledge that seems to be rampant in our society today. We can't eschew experimental science simply because we don't feel good about the results produced by that science.

All the while I have been writing this article, I have been trying to figure out how to get through it without reference to our viscera. Perhaps my readers will be more creative, but I haven't been successful. After all, when you are being affected by your intuition or your emotions, where do you feel it? I'm afraid I have to end by suggesting that you exercise your logic but that you should also listen to your gut. Sorry.

—Lyle D. Feisel, Ph.D., P.E.
Iowa Alpha '61

EXECUTIVE COUNCIL MEETING

The Executive Council met in Indianapolis, IN, on October 27 and 30, 2011.

The Council enthusiastically voted two TBPI Superior Service Awards to retiring advisors of the collegiate chapters. The Council voted a TBPI Resolution of Appreciation to Dr. Amy Kaleita-Forbes, *PA B '97*, Alum-Net Coordinator during 2003-11.

R.L. Werneth, D.A. Stirn, and M.T. Pittard were appointed to the Alumnus Recognition Selection Committee. The Council appointed Wesley A. Repke, *MI A '09*, as District 7 Director to a term ending June 30, 2014.

Councillor Norman Pih reported on the meeting of the Engineering Futures Planning Committee in Knoxville, TN, on September 21. The Council agreed to hold a meeting for all EF Facilitators in Orlando, FL, on June 9, 2012.

The Council approved MindSET Project Grants to the Florida Alpha Chapter for \$500, New York Gamma Chapter for \$100, and Tennessee Alpha Chapter for \$200.

Executive Director J.D. Froula reviewed the final program and logistical details of the 2011 Convention being held in Indianapolis, IN, on October 27-29.

The Council approved the inspection reports of the visits to the petitioning groups at Penn State Erie and the College of New Jersey; both petitions for new collegiate chapters will be presented to the 2012 Convention.

The Council approved Resolutions to modify authorized signatories for TBPI bank accounts; to permit Executive Director C.D. Gomulinski to access the TBPI safe-deposit box and to authorize trust transfers for cash-flow purposes, bequests, and capital gift annuities; and to provide contingent access to the safe-deposit box.

Mr. Froula reported on the status of the 2011 Alumnus Giving Program, the AGP Multi-State Registration Project, ED/STE Schedule of Responsibilities, and updates to the TBPI Trust Investment Reference Document. The Council reviewed the quarterly trust report.

The auditor's report was accepted and the management letter was reviewed with respect to segregation of duties and the size of the Headquarters staff. The Council agreed to seek two bids for audits for 2012-14 and to conduct a risk assessment to be completed by December 2012.

The Council accepted changes to the TBPI health plan for 2011-12 and requested that Executive Director C.D. Gomulinski provide a long-term strategic goal for the plan.

The Council requested that Mr. Gomulinski provide information on the retirement plan, trust fund earnings, trust administration costs, and recommendations regarding possible changes to the Constitution and Bylaws. The Council heard and reviewed a benefit proposal regarding accident and universal life insurance for members.

\$\$ Benefit for Members

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Deluged by a Data Tsunami

A tidal wave of digital information is breaking over us. What's the best way to survive the flood without being overwhelmed by the details?

by Trudy E. Bell

In August 2011, headline news was made by the discovery of a brilliant supernova—a star a bit larger than the sun ending its life in a colossal explosion that blazed brighter than an entire galaxy—in a galaxy 21 million light-years away. The big news was not that, despite its monumental distance (although close on a cosmic scale), the supernova was predicted to brighten enough to be seen through binoculars. The truly eye-popping backstory was that the supernova was discovered only hours after the first light from its detonation reached Earth, through the automated search-and-analysis Palomar Transient Factory (PTF). In the PTF, a California Institute of Technology telescope takes thousands of digital images of most of the heavens twice per night and transmits them to a supercomputer; the supercomputer then compares them on the fly with a database of star fields and galaxies in memory, fast enough that if a galaxy starts to brighten, a second major telescope is immediately directed to start recording spectroscopic observations that same night.¹

Meantime, the National Human Genome Research Institute announced that the cost of sequencing a person's genome has plunged four orders of magnitude in the past decade, from \$100 million in 2001 to \$10,000 in 2011, primarily thanks to computational techniques.²

And in September 2011, astrophysicists from New Mexico State University and the University of California, Santa Cruz, began publishing a series of research papers on the Bolshoi cosmological simulation, run on the Pleiades supercomputer—ranked in June as seventh largest in the world—at NASA Ames Research Center. Faithful to the most meticulous observational measurements from ground instruments and spacecraft, the Bolshoi simulation recreated the evolution of the universe from shortly after the Big Bang to the present; periodically, it captured and stored three-dimensional time steps like frames of a monumental 3-D movie, to trace how dark matter and ordinary matter coalesced into galaxies.³

Yes, researchers in many disciplines are finally realizing their most starry-eyed digital fantasies. A new era of science and engineering is dawning wherein scientists can transform raw data into three-dimensional visualizations of matter from the nanoscale to the cosmos, and virtually walk or fly around atoms or galaxies to explore their data and assist discovery.⁴ Supercomputing is even being enlisted to assist the humble profession of government record-keeping. In a large project funded by the U.S. Department of Health and Human Services, the San Diego supercomputer center on the campus of the University of California, San Diego, is devising a data-mining engine for examining Medicare and Medicaid claims for patterns of fraud.⁵ And the Texas advanced computing center of the University of

Texas, Austin, is working with the National Archives and Records Administration to manage, preserve, and access the nation's billions of documents in the digital age.⁶

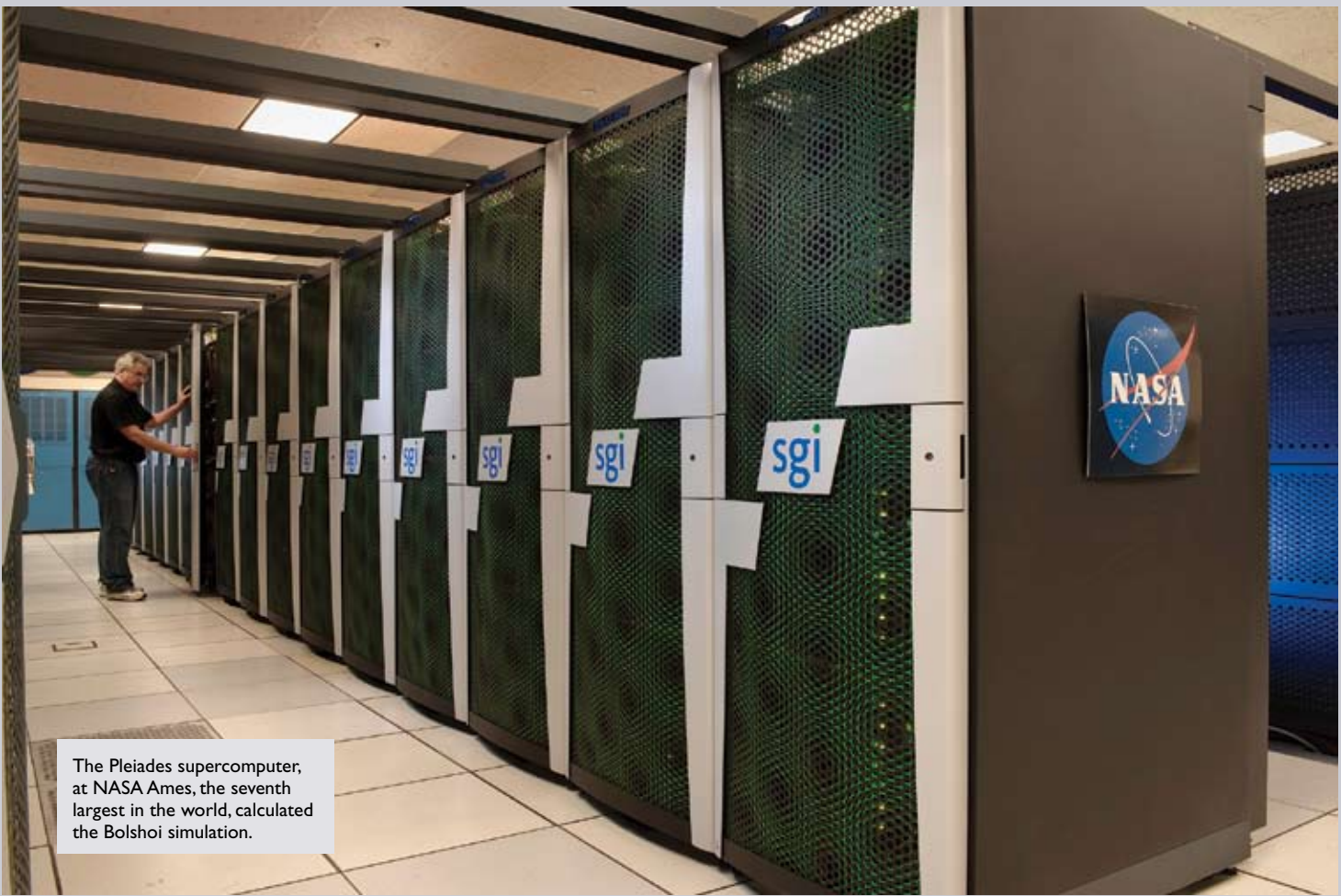
Recognizing the rapidly growing volume and importance of digital data in scientific research, in January 2011 the National Science Foundation began requiring every research proposal to include a supplementary document labeled *Data Management Plan* that outlines how the proposal will disseminate results and archive data.⁷ The terabytes—nay, petabytes—of sensor data and simulation results, however, are flooding in right as computing speed and memory capacity are slamming up against some fundamental limits of physics and economics.

'Flat is the new doubling'

In 1965, Gordon E. Moore (then at Fairchild Semiconductor before co-founding Intel Corp.) famously observed that the density of transistors on chips had doubled every year since the invention of the integrated circuit in 1958 and projected that the trend would continue for another decade.⁸ Moore's prediction seemed uncannily prescient, although he later revised the doubling time to every two years or 18 months. In the electronics industry, where the increasing density of transistors also was linked with dramatic increases in the clock speed and thus the performance of microprocessor chips, his empirical observation became known as *Moore's Law*, as if it were a deterministic law of nature.

But it's not. The computer industry has had a stunning run for more than four decades, every year producing ever-faster computers at ever lower costs. As a result, today's smart phones have the raw computing capacity of a 1970s-era supercomputer.⁹ However, the "essential engine that made that exponential growth possible is now in considerable danger," observed the National Research Council in its June 2011 report *The Future of Computing Performance: Game Over or Next Level?* "Thermal-power challenges and increasingly expensive energy demands pose threats to the historical rate of increase in processor performance."¹⁰ On page 9 of that report, chart S.1 (reproduced on page 18) summarizes the whole story: since 1986, processor performance faithfully followed Moore's Law—until about 2004, when the curve suddenly turned over to become nearly horizontal. "The joke is, 'flat is the new doubling,'" quipped one participant in a question-and-answer session at the fall meeting of the Coalition for Academic Scientific Computation in Arlington, VA, in September 2011.¹¹

For the last seven years, clock speed has hardly budged. The reason is pure physics. The densest, most power-efficient, high-performance chip technology is CMOS (complementary metal-oxide-semiconductor). For decades, engineers have increased performance of individual micro-



The Pleiades supercomputer, at NASA Ames, the seventh largest in the world, calculated the Bolshoi simulation.

NASA: Dominic Hart

processor chips by increasing the density of transistors on a chip, decreasing supply voltage, and increasing clock speed. But a chip's power consumption is proportional to clock speed times the square of the supply voltage, and supply voltage cannot be reduced indefinitely because of quantum effects. Thus, since 2004, the clock speed on an individual chip could not be further increased without increasing power consumption and heat dissipation.

Instead, manufacturers continued to increase the speed and power of computers by two strategies that introduced some level of parallel computation. First, they ganged cores—that is, central processing units or CPUs—to create multicore machines: machines that have two or more cores on a single chip. The CPU or core, of course, is the heart of any computer, as it performs all the mathematical calculations. But a core can crunch only one set of numbers at a time. Having two or more cores running at the same time allows two or more sets of calculations to run simultaneously, increasing the speed of computers running several programs at once. The multicore approach has been so successful that today's laptops are dual-core, quad-core, or more—and supercomputers can have upwards of half a million cores. In the second strategy, manufacturers incorporated graphics processing units (GPUs), which are highly efficient at handling data in parallel, especially for manipulating computer images—the secret to powerful gaming and visualizations.

Increasing parallelism, especially for multicore supercomputers, however, has brought experts face-to-face with several major limits, among them: **1.** legacy code, which over the decades has been written for purely sequential op-

erations, **2.** physics challenges of transferring and archiving petabytes of data, especially in a database form that can be fully searchable by researchers, and **3.** good old-fashioned power consumption and heat dissipation.

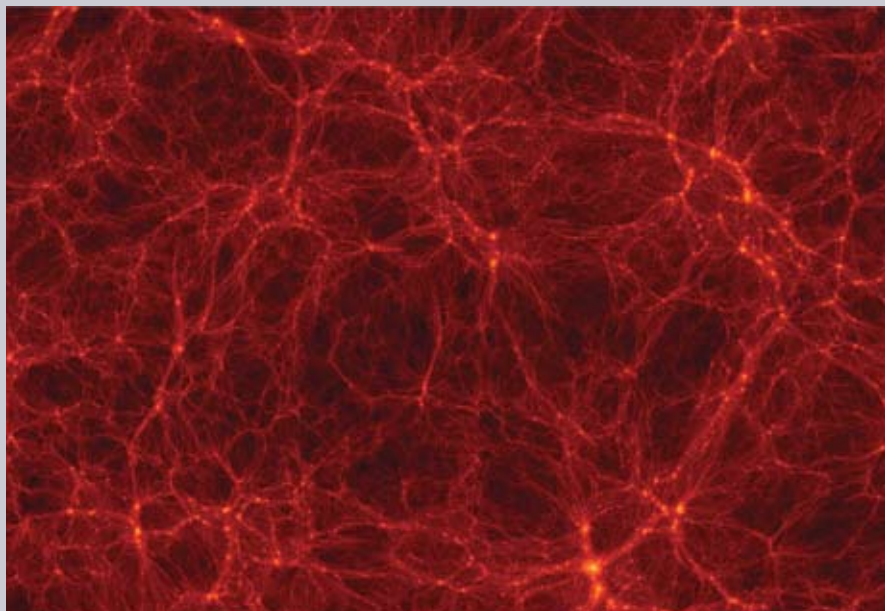
In conference sessions and private interviews this past summer, supercomputer experts openly speculated what an end to Moore's Law may mean for the future of scientific supercomputing, especially for handling vast data sets and simulation outputs. Some even went so far as to wonder whether it could spell an end to the prospect of exascale computing—the hoped-for next-generation high-end computing at speeds 1,000 times faster today's petascale of 1 trillion floating point operations per second (flops).¹²

The conclusion? "The field of high-performance computing is ripe for a huge transition," observed Joel R. Primack, director of the University of California high-performance astrocomputing center at the University of California, Santa Cruz.

"Flash" Gordon

Actually, there is still room for increasing the speed of supercomputing hardware. The San Diego supercomputer center is doing exactly that with its new Gordon supercomputer now on target for completion in January 2012. Although named after the very author of Moore's Law, the new machine may as well be dubbed Flash Gordon, because "its 'secret sauce' is more than a quarter of a petabyte [256 terabytes] of flash memory" instead of traditional hard-disk drives, said SDSC's director, Dr. Michael L. Norman.

Flash memory—yes, the very same NAND flash as that in commercial portable thumb-sized USB-port flash drives



Large cosmological simulations run on supercomputers are the basis for much current research on the large-scale structure of the universe and the evolution of galaxies. This snapshot from the Bolshoi cosmological simulation—which took 6 million CPU hours to run on the Pleiades supercomputer (recently the seventh fastest of the world's top 500 supercomputers) at NASA Ames Research Center—shows filaments of dark matter along which galaxies are predicted to form. The simulation modeled a hypothetical representative volume of the universe measuring about 1 billion light-years on a side, which would contain over a million galaxies. It modeled not just how the minority of visible stars, gas, and dust evolved from shortly after the Big Bang to the present, but also how the vast majority of the invisible dark-matter halos evolved. [Credit: Anatoly Klypin (New Mexico State University), Dr. Joel R. Primack (University of California, Santa Cruz), and Stefan Gottloeber (AIP, Germany).]

and digital-camera memory cards—is nonvolatile solid-state memory: 1's and 0's are represented by differing amounts of charge in electromagnetic quantum wells. Because there is no rotating disk, as in regular supercomputer hard drives, “flash is about 100 times faster to access,” explained Gordon’s designer, SDSC associate director Allan Snavely, who originated the concept of using flash memory. “You are simply transferring electrons in and out of quantum wells; you are not moving a physical disk head that’s made of protons, which are 1,800 times heavier than electrons.” Instead of memory access time being about a millisecond, typical for supercomputer disk drives, Gordon’s memory access time will be only a few microseconds.

Moreover, Gordon is designed to handle the very hardest class of parallel-processing problem: that requiring a lot of connectivity.

Parallel computing problems divide into several basic classes. Some, called “embarrassingly parallel,” are readily decomposed into many independent parts that can be computed simultaneously with great speed in parallel on many cores, which do not need to communicate with one another. For example, consider a radio telescope continuously detecting a thousand different wavelengths and analyzing them for signs of extraterrestrial intelligence: the analysis of each wavelength could be readily allocated to each of a thousand different cores, and the output of any one core would be unaffected by the results from the other cores.¹³ Such straightforward problems require essentially no connectivity between cores. They are also the most fault-tolerant, because if one core physically fails, its work can be readily shifted to a spare.

Another, more challenging, type of parallel computing problem is one in which the work that each part of the computer is doing depends on the work being done on

neighboring parts—thus thousands of cores all need to communicate with one another. Such highly interconnected problems, often called “graph-based,” are a poor fit on traditional multicore supercomputers “because there is no natural way to decompose a graph, such as a social network,” Norman explained. “It won’t fit in a single compute node [core], and the connectivity [needed among nodes] depends on the research question you ask. The best approach is not to partition the data among cores but keep it as one big ‘hunkula’ in memory so you can query it from any direction you want. That’s what Gordon is for.”

Many data-mining problems are of this nature, especially if they are searching social networks or data records for telltale patterns characteristic of certain activities. Simulations of major earthquakes or the evolution of galaxies are other examples, because the physical conditions (e.g., temperature, gravity, velocity) in any one part of the system

depend on the changing physical conditions in neighboring parts. These simulations are typically broken into pieces so that each core of the supercomputer tackles only its own piece of physical space representing its own corner of the universe. However, it has to know what is going on in the rest of the simulation in order to do its own job. Communication among cores can take longer than the computation time required by each core separately.

One challenge in such simulations that spread the work around is what scientists call “load balancing.” If thousands of cores are in rapid intercommunication where each core depends on the results of its neighbors, and “if one core is getting too much work, then all must wait for it to finish,” Primack noted. “Cores should be able to redistribute work. We need compilers for automatic load balancing. Such software doesn’t yet exist.”

With Gordon and other massive supercomputers built for interconnected communications, “now we can realistically tackle the truly hard problems in galaxy evolution,” he exulted. The prospect of fundamentally new architectures for parallel computing with phenomenal interconnectivity has researchers excited by the possibilities it offers—but also sobered because of fundamental physical (and economic) limits.

Speed limits?

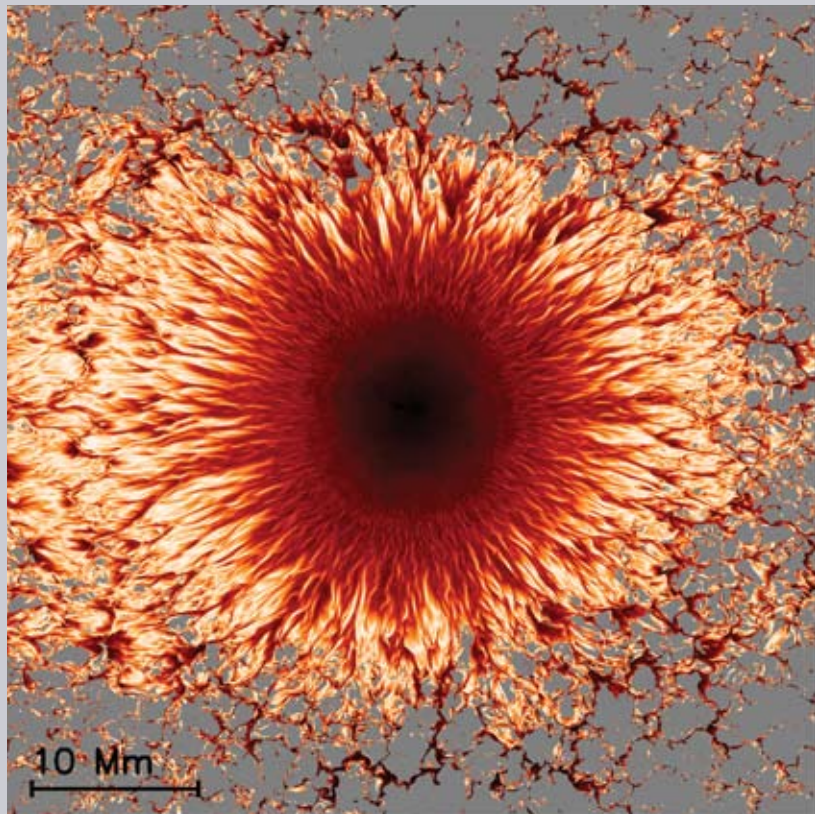
Power consumption: The Hopper supercomputer at Lawrence Berkeley National Laboratory consumes about 3 megawatts, enough to power 2,000 to 3,000 homes for a year. The Chinese 2.5-petaflop Tianhe-1A supercomputer, draws more than 4 megawatts. The 1.7-petaflop Jaguar at Oak Ridge National Laboratory, so far the fastest U.S. supercomputer, consumes about 7 megawatts.¹⁴ Gordon, which needs “only” a megawatt, is a relative lightweight.

But future exaflop supercomputers have been projected to require as much as 75 to 100 megawatts—yes, each machine possibly needing its own independent power-generation substation. (One blogger reported that a running joke at the International Supercomputing Conference in Hamburg, Germany, was that power companies would be giving away free supercomputers to customers who signed five-year power contracts.¹⁵)

Internet connections: After data are gathered by sensors, they must be transferred to a supercomputer for analysis. Similarly, simulation output is not always analyzed on the computer where it is created. Often the results—and perhaps also the raw data itself—must be transmitted

to an archive for safekeeping. “But the amount of data is outgrowing the pipes,” said Primack, referring to the internet and to the tens of thousands of miles of optical fiber buried underground for private data networks. “At today’s data rates, transferring a petabyte [a million gigabytes, or a thousand terabytes] would take a week. So what’s the fastest way to get data across country? Federal Express!”¹⁶

The difficulty of moving massive data sets is causing scientists to rethink the paradigm of taking their data from their sensors back to process it at their office or lab workstations. One new approach is to keep data sets in one place, and have scientists bring their analysis codes to the data: “distributed computing, but centralized storage,” said Norman. “Except for high-performance computing users, most scientists are used to getting archival data storage for free.” he added. “But that cost model is breaking down: data sets are getting so huge that the cost of storage now is on a par with the cost of the supercomputer.” Another model for large simulations, where there may not even be enough space to store all the output one might want, is to analyze the data during the run itself; called “in situ analysis,” it introduces a number of additional issues, such as not preserving the raw data, only preprocessed results.



The interface between a sunspot's umbra (dark center) and penumbra (lighter outer region) shows a complex structure with narrow, almost horizontal (lighter to white) filaments embedded in a background having a more vertical (darker to black) magnetic field. Farther out, extended patches of horizontal field dominate. NCAR scientists modeled this structure in a 3D simulation, giving the first glimpse below the visible surface at the underlying processes.

©UCAR, image courtesy Matthias Rempel, NCAR

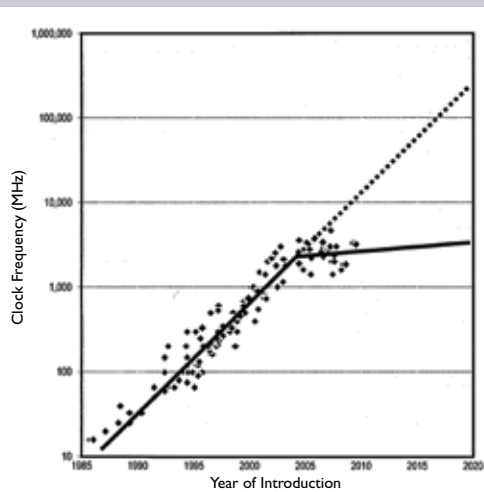
Access in perpetuity: Once at an archive, data shouldn't be in a deep freeze. Rather, sensor readings, simulation results, and other data should be accessible not only to the original principal investigators, but also to other researchers for decades into the future, just as journals and photographs are in a library. Indeed, many types of data—such as global weather records, or patterns of the spread of disease—gain in value over time. And older data are indeed in demand. At the National Library of Medicine, the world's largest medical library, “virtually all materials back to the 1940s are accessed at least once every year” in either print or digital form, declared Jerry Sheehan, NIH-NLM assistant director for policy development.¹⁷ Librarians of all stripes are thus among the leaders planning digital archives with a view to long-term access.¹⁸

Wanted: data scientists!

So who may deal with such vast existing and future data sets? Teams of mathematicians, computer scientists, and computational scientists are already planning for how to face the new challenges that will arise with the changing architecture of computers and the monumental increase in sensor data and computer-generated simulation results.



The Jaguar supercomputer at Oak Ridge National Laboratory, the largest supercomputer for scientific research in the U.S. [Credit: National Center for Computational Sciences, ORNL]



Microprocessor performance (clock frequency) from 1986 to 2008 closely tracked the growth rate of density of transistors on microchips—known as Moore’s Law—growing by about a factor of 100 per decade. But since 2004, processor performance has been increasing at a rate of only about 2 per decade. The vertical scale is logarithmic. [Credit: Figure S.1, page 9, in *The Future of Computing Performance: Game Over or Next Level?* The National Academies Press, 2011.]

Another issue is that, with half-a-million cores or more, “you’re going to have failures,” Primmack added. “If a core fails, you don’t want your whole job to fail, or have to start over, because some computing jobs require

weeks of calculations. You must build in fault-tolerance.”

Moreover, the statistical likelihood of core failures challenges the traditional notions of scientific reproducibility. “Routing is done dynamically, so in consecutive runs, messages may be bundled differently. If a core changes or fails, it may change the order of operations, possibly with some effect on the outcome. We have to acknowledge that this happens, and incorporate this knowledge into our understanding of our simulation results,” said Ann S. Almgren, a computational scientist at Lawrence Berkeley National Laboratory.

“Some people feel we need a new science of data,” observed Wendy Wigen, technical coordinator of the big data senior steering group of the federal networking and information technology research and development program.¹⁹ Her comment, expressed at the fall 2011 CASC meeting, was echoed by others. “Most scientists write lousy code—but IT people who write code don’t understand earth science” or other specialties, noted Jack A. Kaye, associate director for research in the earth sciences division of the National Aeronautics and Space Administration at NASA headquarters in Washington, DC.

Upshot (engineering students, take note!): “Not only do all students need to be trained to utilize open data, but individuals need to be formally educated as ‘data scientists,’” observed the 2011 NSF report *Changing the Conduct of Science in the Information Age*. “A new cohort of computational scientists who can manage the integration of data sets from disparate sources is essential.”²⁰

Notes

1. National Energy Research Scientific Computing Center, “Supernova Caught in the Act: Earliest-ever Detection Made Possible by Computing, Networks,” www.nersc.gov/news-publications/science-news/2011/supernova-caught-in-the-act/. The Palomar transient factory website is at www.astro.caltech.edu/ptf/.
2. National Human Genome Research Institute, “Data from the NHGRI Large-Scale Genome Sequencing Program,” www.genome.gov/sequencingcosts/.
3. “Bolshoi Cosmological Simulation,” <http://hipacc.ucsc.edu/bolshoi/> and <http://astronomy.nmsu.edu/aktypin/bolshoi/> and the MultiDark Database www.multidark.org/multidark/.
4. The value of visualizing and exploring of large data sets as a method of scientific discovery is discussed *The Fourth Paradigm: Data-Intensive Scientific Discovery* (edited by Tony Hey, Stewart Tansley, and Kristin Tolle, Microsoft Research, 2009, www.research.microsoft.com/en-us/collaboration/fourthparadigm/); *Changing the Conduct of Science in the Information Age: Summary Report of a Workshop Held on November 12, 2010*, National Science Foundation, June 28, 2011 www.nsf.gov/pubs/2011/oiise11003/; International Assessment of Research

and Development in Simulation-Based Engineering and Science (WTEC Panel Report, World Technology Evaluation Center, 2009, www.wtec.org/sbes/; and a series of six reports released April 2011 from the NSF-wide Advisory Committee for Cyberinfrastructure (ACCI), www.nsf.gov/od/oci/taskforces/.

5. Medicaid Integrity Group, cms.sdsc.edu/.
6. “Texas Advanced Computing Center helps the National Archives find solutions to the nation’s digital records deluge,” www.utexas.edu/features/2011/04/11/tacc_archives/.
7. “Data Management Plan for NSF SBE Directorate Proposals and Awards,” www.nsf.gov/sbe/sbe_datamgmtplanpolicy.pdf and “Dissemination and Sharing of Research Results” at www.nsf.gov/bfa/dias/policy/dmp.jsp.
8. Gordon E. Moore, “Cramming more components onto integrated circuits,” *Electronics* 38 (8), April 19, 1965, at [ftp://download.intel.com/museum/moores_law/articles-press_releases/gordon_moore_1965_article.pdf](http://download.intel.com/museum/moores_law/articles-press_releases/gordon_moore_1965_article.pdf). See also “Excerpts from A Conversation With Gordon Moore: Moore’s Law,” at [ftp://download.intel.com/museum/moores_law/video-transcripts/excerpts_a_conversation_with_gordon_moore.pdf](http://download.intel.com/museum/moores_law/video-transcripts/excerpts_a_conversation_with_gordon_moore.pdf).
9. “Supercomputers vs. Mobile Phones,” in the blog “Walking Randomly” by IT engineer Michael Croucher at Manchester University, June 2, 2010, www.walkingrandomly.com/?p=2684.
10. Samuel H. Fuller and Lynette I. Millett, editors; Committee on Sustaining Growth in Computing Performance; National Research Council. *The Future of Computing Performance: Game Over or Next Level?*, The National Academies Press, 2011. p. vii. Available from www.nap.edu/catalog.php?record_id=12980.
11. Some presentations from the CASC fall meeting are available at casc.org/pastmeetings.php.
12. Exascale computing basics are outlined in the 2009 backgrounder “Building the Exascale Computer,” pcplus.techradar.com/node/3072. See also Michael Feldman, “Moore’s Law Meets Exascale Computing,” HPC wire, June 29, 2011, www.hpcwire.com/hpcwire/2011-06-29/moore_s_law_meets_exascale_computing.html.
13. Embarrassingly parallel problems are those that lend themselves to projects for which we all can volunteer our home computer’s idle CPU cycles to crunch away at one part of a huge scientific problem—effectively letting our machines become nodes in a worldwide-distributed supercomputer. Many volunteer parallel computing projects are listed at boinc.berkeley.edu/projects.php.
14. David Murphy, “Homegrown China Supercomputer Hits One Petaflop with Lower Power,” October 29, 2011, www.pcmag.com/article2/0,2817,2395554,00.asp?fbid=qmklmkzdamb.
15. Sumit Gupta, “Can We Hurdle the Supercomputer Energy Wall?” July 5, 2011, www.enr.com/blog/2011/07/soapbox/supercomputing-energy-wall.aspx.
16. Molecular biologists worldwide, finding the bottleneck to transferring genomic results is internet bandwidth, have resorted to shipping hard drives by mail! See “Knowing me, knowing you,” International Science Grid This Week, September 7, 2011, www.isgtw.org/feature/knowing-me-knowing-you. The usual 10 gigabit/sec speed of today’s high-speed internet translates to 1.25 gigabytes/sec. (every byte is 8 bits) = 1.25 GB/sec. = 108 TB/day, so transferring 1 PB requires 9-10 days. The first legs of the 100 gigabit/sec higher-speed internet could begin operation in 2011-12, but transmitting 1 PB would take a couple of hours.
17. Statistics about the use of data at the NLM as presented in Sheehan’s talk at the fall 2011 CASC meeting are available at casc.org/pastmeetings.php.
18. For example, an NSF-sponsored workshop “Research Data Lifecycle Management” bringing together researchers, campus IT leaders, and library/archives specialists was held at Princeton University July 18–20, 2011; presentations are available from res.columbia.edu/rdlm, and a workshop report is forthcoming.
19. More information about the NITRD big-data group is at www.nitrd.gov/subcommittee/bigdata.aspx.
20. Changing the Conduct of Science in the Information Age: Summary report of workshop on November 12, 2010, National Science Foundation, June 28, 2011, p. 8. Available from www.nsf.gov/pubs/2011/oiise11003/.

Science journalist **Trudy E. Bell** (t.e.bell@ieee.org, www.trudyebell.com) is a former editor for *Scientific American* and *IEEE Spectrum* and earned an M.A. in the history of science and American intellectual history. The author of *Weather* (part of the Smithsonian Science 101 set, HarperCollins 2007), lead writer for the IEEE’s millennium book *Engineering Tomorrow: Today’s*



Technology Experts Envision the Twenty-First Century (IEEE Press 2000), and author of 10 other books and 450 articles, she is senior writer for the University of California high-performance astrocomputing center.

Good Guys, Wiseguys...

Taking a look at the days when “an offer he couldn’t refuse” would simply make that problem walk away

by Samuel C. Florman, P.E., *New York Alpha '44*

The crime took place in the Bronx on the northeast corner of Claffin Avenue and 195th Street. The perpetrators stood on the sidewalk adjoining a nearly completed six-story apartment house that my construction firm was building. When I arrived on the scene, three men were engaged in animated conversation.

The masonry subcontractor, Lou, was pleading with a city inspector to grant him “just a few more minutes,” and our construction superintendent, Norman, was saying something like “jeez, give the guy a break.” I joined the group just in time to see the inspector shake his head and then say loudly, “No way, no how!”

It seemed that a small forklift was being used to transport concrete blocks from a parked truck into the building, and a problem had arisen when no updated building permit could be produced. The discussion grew more and more heated, and for a moment I thought that the mason and the inspector were going to come to blows.

What Actually Happened?

But suddenly the shouting stopped and very quietly the inspector said, “OK.” Pause. “It’ll cost you a hundred bucks.” Norman and I glanced at each other and cautiously backed away. But not before we heard Lou say softly, “Oh yeah? A hundred bucks.” Then even more softly, “You gotta be kidding.” Finally, almost in a whisper: “I can have you killed for fifty.”

There was silence as the two men studied each other. After a moment, the inspector turned around, walked swiftly to his car, and drove away.

I refer to a crime, yet what had actually happened? On the face of it, a bribe was solicited and murder threatened while two witnesses—one of them me—stood by in stunned silence. But what if the verbal exchange was not meant to be taken literally? What if it was merely a ritualistic expression of intimidating bluster like two athletes talking trash

on a basketball court? On the other hand, what if . . . ?

Clearly the inspector took Lou’s words seriously. Very seriously. And as I recall the scene, the atmosphere was charged with menace.

Whenever I tell the story it gets a laugh, or at least a smile. Partly this is because the tale contains a surprise punch line. But there is something else that entertains my audience—the shiver of fear, together with the comfort of

personal safety, the very same frisson that makes it a special pleasure to view *The Godfather* or *The Sopranos* in the comfort and security of a theater or one’s living room.

I start to write about my career as a builder, and find myself leading with murder and intimidation. A touch of swagger and bravado? I suppose so. But not idle fantasy. In the words of the New York State Organized Crime Task Force (1990): “Historical and contemporary evidence, including our own criminal investigations, establish beyond any doubt that corruption and racketeering pervade New York City’s construction industry.” And, bearing on the incident just described, continued: “The presence of so many



A construction worker installs girder bolts on New York City’s Empire State Building in 1931, with the Chrysler Building shown behind.

known organized crime figures in the industry makes the explicit threat of violence credible and the implicit threat of violence sufficient.” The implicit threat of violence was clearly enough to send one veteran building inspector quickly on his way.

The Mafia and construction are joined in the public’s imagination—and, as amply documented—literally in the real world. But established criminal organizations have no monopoly on malfeasance in the industry. Society is not that neatly organized, corruption not so circumscribed. Wherever construction contracts are awarded, and buildings erected, skullduggery seems endemic—among contractors, developers, tradesmen, politicians, purchasing agents, inspectors, and union delegates. The media report almost daily on every conceivable sort of misdeed—bribes, kickbacks, extortion, bid-rigging, inflated claims, use of inferior materials, and more.

Most Corrupt

Transparency International, the global coalition founded in 1993 by an array of highly respected individuals, cites construction as the single most corrupt industry that exists on the face of the earth. The contract award process appears to lend itself to underhanded dealings, stratagems that even competitive bidding cannot eliminate. The very activity of building is linked historically with cheating. Paradoxically, the many layers of supervision intended to monitor construction projects and guarantee propriety—the permits, change orders, regulations, approvals—provide unique opportunities for wrongdoing.

Adding to these time-honored problems, we find violence on the job sites, the belligerence of rugged men sometimes getting in one another’s way, the perpetual conflict of union versus non-union workers, and occasionally one trade fighting for its very existence, such as when, in the 1950s, drywall began to replace plaster. The civil rights movement saw minority workers battling for their rightful share of employment, and then, in some cities, falling prey to labor racketeers. In New York in the 1980s, aggressive gangs swept down on building sites in yellow school buses, demanding jobs, but seeking payoffs and kickbacks, often two or more mobs competing, sometimes with gunplay involved.

Beyond crime, corruption, and violent intimidation, building construction, in its very nature, is rough and tough and turbulent. Visit any job site: motion and noise, monstrous machines, enormous beams, cables swaying, concrete hoisted aloft in buckets. The weather—sometimes frigid,

sometimes sweltering—adds to the feeling of adventure. Observe the men, the hardhats: boisterous, seeming as strong and hardy as the tools they wield; rugged, macho, toiling deep in the earth and high into the sky, as much a part of American mythology as the cowboys of earlier days. (There are a few women on the jobs, but very few.)

In a busy city most citizens walk by construction sites with hardly a glance. And even sidewalk superintendents may idle away the time wrapped in their own thoughts. Yet alert observers cannot help but feel the pulse-quickening excitement infused with a sense of danger.

And the danger is real, independent of crime and conflict. In the United States there are more workers killed in construction than in any other single industry. The death rate per capita may be slightly higher in a few other occupations—notably mining, logging, and ranching—but the 1000 to 1300 annual construction fatalities is the largest number for any industry sector, representing approximately one in every five recorded in the nation. As might be expected, the number of non-fatal injuries is also extremely high. Nor are the perils limited to workers on the job. Occasionally, a passer-by—or even a citizen hundreds of yards distant from a building site—is injured, or even killed, in a freak accident.

Deadly Consequence

After the construction process ends, the hazards associated with man-made structures do not

disappear. Buildings, new and old, shed bricks and stone, sometimes with deadly consequence, or even collapse, explode, or spew steam from broken pipes. Physical perils naturally have financial consequence, as evidenced by the extremely high insurance rates associated with the activity of building.

This litany of menace brings us inevitably to the phenomenon of financial disaster. Physical mishap is only one of the many dangers that confront the builder. Business risk has burrowed into the very marrow of the construction industry, making it America’s most perilous enterprise, except for restaurants, as a percentage of company failures. In any given two-year period almost a quarter of the nation’s non-single-family construction firms close their doors. Half of new firms fail within four years—three-quarters within 10 years.

Part of this stems from the ease with which the adventurous can enter the field—all it takes is a few tools, a few dollars, and some guts. But, while a large majority of the nation’s 7.2 million salaried construction workers are



A construction site carpenter at work in 1942 on the TVA’s Douglas Dam in Tennessee.

employed by very small companies—five employees and fewer—financial ruin stalks firms of every size. The top 400 contractors—those whose annual volume runs from the \$150 million range to several billion—do more than 20 percent of the nation’s \$1.25 trillion building, and take a sizeable share of the financial setbacks. Every year sees large, long-established firms meet devastating losses.

According to a report prepared by FMI Corporation, a prominent management consultant, the typical contractor is “numb to risk,” exhibiting “a heroic audacity.” There is probably some truth to this view; but I think it underestimates the treacherous nature of the business and the role of bad luck. Be this as it may, to quote an often heard maxim, in the construction industry financial ruin is “just one bad job away.”

So how did I get into this business? Quiet by nature, devoted to family, a lover of books, opera, and the baseball New York Giants, I was a high-achieving student who once thought of becoming a mathematician or possibly a physicist. I never liked riding my bike too fast, much less doing the reckless things that appeal to so many thrill-seekers. I don’t much care for heights, nor for gambling, even when I win.

Taking Chances

Not that I’m totally immune to the attractions of risk. None of us is. Scientists tell us we enjoy the charge of dopamine that accompanies danger because taking chances helped early humans find food and mates, hence the genes that favor daring are within us all. It’s a question of degree, however, and though I enjoy adventure stories and cowboy movies, watching sports on TV, even—once upon a time—playing a rugged game of soccer, I don’t fancy that my quota of peril-loving genes is very high. Also, assuming that we are shaped by nurture as well as nature, there was little about my childhood environment that would have contributed to making me a daredevil. As a city kid I occasionally dashed between moving cars, rode the subways alone, and even shared forbidden ventures into the west side railroad yards. But each time I left home, my parents’ parting admonition was, “Watch your crossings!” and to a certain extent I always have.

As for corruption—Jeepers! For 12 years, in the 1930s and 40s, I attended the Ethical Culture Fieldston School in New York City, taking an ethics class at least once a week.

Not that a few hundred ethics classes make for a good person; but the school was serious in its purpose and, in good measure I believe, effective. Also, like many kids of my time and place, I was taught to “behave,” certainly to respect authority and obey the law. Pranks and a few white lies—well, that was to be expected; but criminal malfeasance, action that might bring shame on the family—that was, and is, a horror beyond imagining.

And yet I’ve made my career in the construction industry,

which is renowned for crime, corruption, violence, physical danger, and chronic risk of financial catastrophe.

I look back on this career with relish, not, I hasten to say, because I engaged in crime, corruption, and the rest; but because of the challenges met, the rousing adventures encountered. Also, there have been satisfactions of a different sort: the enchantment of seeing architecture made real; the pleasure of solving complex technical problems; the pride of creating housing, hospitals, schools, places of worship—shelter for the body and nourishment for the spirit. And wonderful people met on the journey—along with a challenging assortment of knaves.



An excavator demolishes a house in Hawaii recently.

This is chapter one of the book *Good Guys, Wiseguys, and Putting Up Buildings* by **Samuel C. Florman**,



P.E., *New York Alpha '44*, scheduled for publication by Thomas Dunne Books, an imprint of St. Martin’s Press, in March 2012. Florman is a writer as well as a practicing engineer and chairman of Kre- isler Borg Florman Construction Company in Scarsdale, NY. He was elected to the National Academy

of Engineering in 1995. His nearly 300 articles dealing with the relationship of technology to general culture have appeared in professional journals and popular magazines. Florman, born in New York in 1925, is a fellow of the American Society of Civil Engineers.

Texas Delta-Qatar Initiates

TEXAS A&M UNIVERSITY AT QATAR is a branch campus of Texas A&M University in College Station, TX. The Doha, Qatar, campus was established in 2003 under the umbrella of the Qatar Foundation for Education, Science, and Community Development. Doha, the capital and the largest city in the state of Qatar, is one of the most dynamic and fast-growing cities in the world.

Texas A&M at Qatar offers ABET/EAC-accredited undergraduate engineering degrees in chemical, electrical, mechanical, and petroleum engineering. The school has offered master of science and master of engineering degrees in chemical engineering since fall 2011. Total enrollment in the four undergraduate engineering disciplines exceeds 500 students, who come from Qatar, the region, and the world. Since 2007, Texas A&M has awarded more than 200 engineering degrees at this campus.

Tau Beta Pi, the Engineering Honor Society, is the first honor society established on the campus. It is also the first international sub-chapter unit formed by Tau Beta Pi since its inception in 1885.

The Texas Delta at Qatar Chapter's inaugural ceremony was held on April 20, 2011, when 20 members were



initiated—19 students and one eminent engineer.

Dr. Mark H. Weichold, P.E., *Texas Delta '78*, dean and chief executive officer of Texas A&M at Qatar, served as the inaugural Advisor to the organization, and **Dr. Hamid R. Parsaei**, *Texas Delta '80*, associate dean for academic affairs, is the current Chief Advisor. The Texas Delta at Qatar Chapter plans to hold one initiation ceremony every April.



Tau Beta Pi's First International Initiation: Texas Delta-Qatar initiates with advisors and faculty at the inaugural ceremony in Doha, Qatar. Dr. Mark H. Weichold is fifth from left, and Dr. Hamid R. Parsaei is seventh from right.

On Campus (top): Students pass the Bent Monument situated at the campus entrance.

President Simonson Reports to the 2011 Convention

The Executive Council leads the Association under the provisions of the Constitution and Bylaws and the Acts of the Convention. It provides leadership to guide national programs through Executive Director and Secretary-Treasurer Jim Froula, Assistant Secretary-Treasurer Roger E. Hawks, the Headquarters staff, District Directors, chapter advisors, and many additional outstanding volunteers. The Council receives guidance from and reports to the Convention.

THE CONDITION OF THE ASSOCIATION

Tau Beta Pi is the largest engineering society in the world with more than 526,000 initiated members. The number of active members is most important to the health of the Association. Tau Beta Pi's 237 chapters had a very good year—initiating 8,747 members, an increase of 47 compared to the previous year and an increase of more than 1,000 since reported four years ago. I challenge you to help me to report another increase in the number at the 2012 Convention in Lexington, KY.

Tau Beta Pi is a very active honor society, providing many member benefits. Your attendance at this Convention is an opportunity for you to be involved in conducting the business of Tau Beta Pi. Your participation is important for the future of our Association. Please accept your responsibilities and be actively involved. This Convention is funded from many sources, including a portion of each member's initiation fee, contributions from 11,460 members, and earnings from the Association's Convention Fund. Tau Beta Pi's annual budget is about \$3 million with just under \$1 million each year provided by alumni contributions. The assets of the Association include nearly \$20 million of portfolio investments, an increase of more than \$2.5 million compared to last year. Tau Beta Pi's financial position is solid. Our staff is talented, loved by the Association, and efficient. We are supported by hundreds of volunteers and thousands of donors. Every year we are joined in our mission by several thousand top engineering students.

2010 CONVENTION BUSINESS

Each year the Convention has an opportunity to make changes to the Constitution and Bylaws. One constitutional amendment and one bylaw amendment were approved by action of last year's Convention in King of Prussia, PA.

OTHER EC ACTION SINCE THE 2010 CONVENTION

The Executive Council has been very busy during the past year. The major activity was initiated by the announcement of Jim Froula's retirement at the 2010 Convention. Through a lengthy and thorough search, Curt Gomulinski has been selected to serve as only the

Association's fourth Secretary-Treasurer and second Executive Director. The final step of the transition process will occur on Saturday evening. Please take time to get to know Curt during the next couple of days and throughout the year.

Mr. Froula's retirement created an opportune time to revisit the vision of this outstanding Society. Rodger F. Smith, *WI A '64*, managing director of Greenwich Associates and Chair of Tau Beta Pi's Trust Advisory Committee since 1985, proposed a plan to accomplish this. The Vision Development Group was created to do *blue-sky* thinking for Tau Beta Pi.

A group of former corporate CEOs was assembled to work with Executive Councillor Norm Pih and me. Former CEOs Gil Amelio and Henry Schacht represented National Semiconductor, Cummins Engines, Lucent Technologies, and Apple. Others are Jay Light, dean emeritus at the Harvard Business School; Pat Harker, former dean of the Wharton school of business at the University of Pennsylvania and current president of the University of Delaware; Harry Lange, former manager of Fidelity's Magellan Fund; Ralph Rockow, founder and president of Exodyne, Inc., in Phoenix, AZ; Ray Rothrock, General Partner of Venrock Associates, a venture capital firm in Palo Alto, CA; and Rodger Smith. These gentlemen are all members of Tau Beta Pi, have a genuine interest in the Association, and have volunteered valuable personal time to serve our Society.

We are fortunate to have their commitment for this purpose. Our first meeting was in New York City in April 2011. Our second meeting was in Manhattan on October 26. I will give you only a brief summary of our thoughts. The discussions yesterday focused on the purpose of Tau Beta Pi and initiatives that we, as the honor society for the engineering profession, may want to embrace. Much of the agenda focused on integrity, continuing to honor high achieving engineering students, creating an aspiration for freshmen engineering students, enhancing the initiation process to create member pride, supporting our member's continued success, and establishing alumnus programs to serve Tau Beta Pi. We really want Tau Beta Pi to represent the *Gold Standard of Engineering*. The Vision Development Group will meet again in February 2012 to complete a set of recommendations to the Executive Council.

The Vision Development Group has recommended that we gather information from our members. Focus group discussions will be held at this Convention. Most groups will meet after lunch on Saturday and will be facilitated by national officials. How can Tau Beta Pi better serve its members? What is your vision for our Society? Your input is important and will play a critical role in the future of our Association. This is an historic time for Tau Beta Pi. Participate enthusiastically.

SPECIAL WELCOME

I want to extend a special welcome to three delegates from the Middle East country of Qatar. These Tau Bates do not represent an international chapter, *per se*. They are members of the Texas Delta Chapter at Texas A&M University at Qatar. Welcome to Indiana!

TONIGHT

You will have a chance to meet Rodger Smith, the driving force behind our Vision Development effort at tonight's Welcoming Dinner. Rodger will deliver the Convention keynote address and will be joined by Harry Lange to present two seminars on personal finance this evening. I encourage you delegates who are not on a committee and anyone else who is available to attend. I encourage all of the committee delegates to work efficiently in your first meeting after dinner so that you also can attend and benefit from the seminar.

CHALLENGE

Let's have a great Tau Beta Pi year! I challenge you to convert the energy that you bring to this Convention into productive projects to benefit your chapter members and to impact positively the engineering profession. I hope that you will benefit personally from your experiences here and from your chapter activities throughout the year. We have the privilege to be guests of Indianapolis and the Crowne Plaza. Let's be responsible Tau Bates and represent our Society and our respective universities well in all that we do. Each delegate is responsible for attending all meetings according to the full Convention schedule, and many of you have already attended the Career Fair earlier today.

During the next few days, you will conduct the business of the Association, meet outstanding engineering students from other chapters, and have the privilege of helping us honor the five 2011 Tau Beta Pi Laureates, the 2011 Distinguished Alumnus, the 2011 Outstanding Advisor, and the 2011 Tau Beta Pi-McDonald Mentor. Enjoy the experience!

2006-14 PRESIDENT

Larry A. Simonson, South Dakota Alpha '69, Ph.D., P.E., received B.S., M.S., and Ph.D. de-



grees in electrical engineering from South Dakota School of Mines and Technology and returned to his *alma mater* as a member of the faculty after working for Texas Instruments for three years. He is former departmental chair and current Hoffert Professor and associate dean for

advancement. He travels extensively to meet with School of Mines alumni and corporate officials throughout the country. Dr. Simonson also serves as a program evaluator for ABET.

He was initiated into Sigma Tau in 1968 and has served as Chief Advisor of South Dakota Alpha since 1986, District 12 Director during 1994-2006, and Engineering Futures Facilitator during 1990-2008. He was recognized as his university's presidential outstanding professor in 2004 and as the Tau Beta Pi 2002 National Outstanding Advisor. Dr. Simonson is a registered professional engineer and has served as president of the South Dakota Electrical Commission since 1996. In 2001, he founded Youth Engineering Adventure, a week-long program for high-school students interested in mathematics and science.

WEBSITE REDESIGN CONTEST

The 2011 Convention Committee on Website Development recommended and the Convention approved a competition among TBPI chapters to submit sample designs for an updated Association home page and a consistent redesign across all pages of the www.tbp.org website.

Graduate and undergraduate members are eligible to compete in this design competition. The deadline for submitting a new website template, sample code, and design framework is March 1, 2012. Contest submissions and questions may be sent via email to dylan@tbp.org.

The winning design will be selected by mid-March 2012. The Society will offer up to two members of the winning team a paid summer internship at Headquarters in Knoxville, TN, to work with the webmaster on implementing the new design.

Here are the basic rules to follow:

- The template must adhere to all current design standards (HTML, XHTML, CSS, etc.).
- The template must be compatible with leading web browsers: Firefox, Google Chrome, Internet Explorer, and Safari (no content requiring a flash-player please).
- There is a limit of two "team" entries per chapter. Each submission will be judged separately.
- No monetary refunds are available for any resources used in completing a contest entry.

For more information download the complete guide to the TBPI Website Design Contest. Here you will find sample websites with important features and creative ideas for inclusion in submissions.

Indiana Chapters host the 2011 gathering Tau Beta Pi's 106th Convention

THE 106th Convention of Tau Beta Pi was held in Indianapolis, IN, October 27-29, 2011. These 455 members represented 221 collegiate chapters, six alumnus chapters, and the entire organization. Of the total, 314 were students and 141 were alumni. Chapter advisors totaled 53, all invited and most partially reimbursed by Tau Beta Pi. More than 60 guests, recruiters, and consultants participated—enjoying the city, other nearby attractions, and banquets.

The five Indiana Chapters were official hosts of the Society's seventh national meeting held in the state. The Arrangements Chair was **Mark J. Tozzi, IN A '12**, who, with Assistant Arrangements Chair **Yichao Pan, IN I '12**, led the host committees in such duties as transportation, publicity, souvenirs, and hospitality.

Headquarters for this Convention were at the Crowne Plaza at Historic Union Station, and delegates also stayed at the Omni Severin Hotel. Five meals were enjoyed and all meetings were held in the Crowne Plaza. Comprised of 30 booths hosted by recruiters from graduate engineering programs and corporations, a popular Recruiting Fair enhanced Thursday's activities.

The Convention formally opened in the Grand Hall in Union Station on Thursday afternoon. It closed on Saturday night with the Initiation and Award Banquet in the same venue—followed by a Halloween costume party with a local disc jockey. Four business meetings were held, beginning with Thursday's session when the President's Report for the Executive Council was presented and ending with the business actions on the final banquet program, when the 2011 Tau Beta Pi Distinguished Alumnus, Laureates, National Outstanding Advisor, McDonald Mentor, and national chapter award winners were honored and **Executive Director Curtis D. Gomulinski, MI E '01**, the Society's second CEO and fourth Secretary-Treasurer, was installed.



Special events included a Thursday welcoming banquet presentation on "Engineering Your Story" by **Rodger F. Smith, WI A '64**, (left) managing director of Greenwich Associates and Tau Beta Pi Trust Advisory Committee Chair. He and **Harry W. Lange, MI Z '75**, portfolio manager for Fidelity Management & Research Company, discussed investments and personal finance in three outstanding special sessions on Thursday and Friday evenings.

All business at Tau Beta Pi Conventions is handled by committees. Seven standing committees are called for in the Constitution, two



ad hoc committees were appointed, and every collegiate chapter voting delegate served on a group.

Full details of the business meetings are recorded in the official minutes and in detail in the December 2011 BULLETIN (www.tbp.org). Major actions of the Convention are reported in this article.

One New Chapter Granted

In response to a petition received during 2010, a new collegiate chapter of Tau Beta Pi was granted by the Convention. The successful petitioner was the local engineering honor society at the University of San Diego, which was represented at the Convention by a student officer and one advisor. Installation ceremonies are planned for California Alpha Epsilon on February 25, 2012. This will raise the number of active collegiate chapters to 238.

Chapter Programs & Practices

Understanding the complexity of Tau Beta Pi's financial status presents challenges to students, but the Chapter and Association Financial Affairs Committee democratically reviewed all financial matters—including the budget and Executive Director's and auditor's reports—and concluded that the Association's financial health is in proper order.

The committee recommended, and the Convention adopted, specific allowable Convention expenses beyond

2011 • NATIONAL • CONVENTION



those specified in the Bylaws for delegates to the 2012 meeting and increased the allowed meal reimbursements. The group worked effectively with chapters to resolve debts, and reviewed the 2010-11 reports of the Society's auditor and Executive Director, and the budget for 2011-12. It concluded that Tau Beta Pi's financial health is in proper order.

The Constitution and Bylaws Committee spent time dealing with a proposal to clarify the terminology and processes of postponement of initiation, and the Convention amended the Bylaws to do so, by the required three-fourths vote; these changes became effective immediately.

The Convention also adopted, by the required vote, (1) an amendment to Constitution Art. IV, Sec. 2(g)2, to add a fourth alumnus member to the Fellowship Board and clarify the Board's duties and (2) an amendment to Constitution Art. V, Sec. 2-4, to update the retirement provisions for Headquarters staff to meet current practice; final approval of these changes is subject to chapter ratification.

Finally, the committee reviewed and recommended changes to the Convention Code of Conduct.

The Rituals Committee organized an impressive model initiation ceremony for 31 students, one alumnus, and one eminent engineer of Indiana Alpha and three students of Indiana Gamma. The Convention made no change to the Ritual.

The Award Committee worked long hours in reviewing the 2010-11 records of the chapters and in selecting the recipients of the R.C. Matthews Outstanding Chapter and the R.H. Nagel Most Improved Chapter Awards. Announcement of these awards and the 18 honorees in the Chapter Performance Scholarship Program are reported in detail on pages 28-29. The group also modified the process to improve the selection of the R.C. Matthews Outstanding Chapter and R.H. Nagel Most Improved Chapter.

2014 Convention

The 2011 Convention reviewed a proposal from Washington Delta and accepted that bid to host the 2014 Convention in Spokane. This recommendation was reviewed by the Executive Council in December, and the decision by the Convention was upheld.

2011 Tau Beta Pi Laureates

The attendees enjoyed both meeting and hearing about the diverse achievements of Laureates **Rosary C.T. Abot, IN**

I'11; Zachary W. Carr, NJ A '11; Ann M. Gilman, IA A '11; Jonathan A. Gross, AZ A '11; and Jennifer A. Johnson, SC A '11. Vice President Solange C. Dao presented commemorative plaques and \$2,500 checks to each.

Tau Beta Pi-McDonald Mentor

The delegation met and learned about 2011 McDonald Mentor **Dr. William R. Goodin, California Epsilon '75**, director of short-course and technical management programs at the UCLA extension, where he is an Advisor to California Epsilon. Councillor Norman Pih presented his commemorative medallion, \$1,000 check, and another \$1,000 for his chapter.

National Outstanding Advisor

All were pleased to meet 2011 TBPI National Outstanding Advisor **Dr. Robert L. Ward, P.E., Ohio Iota '88**, a professor of civil engineering at Ohio Northern University. He has served as Chief Advisor to Ohio Iota since 1996. Councillor Jonathan F.K. Earle presented \$1,000 and a commemorative plaque to Dr. Ward and another \$1,000 for Ohio Northern University's engineering-school discretionary fund.

Distinguished Alumnus

The attendees enjoyed hearing the career accomplishments of 2011 Tau Beta Pi Distinguished Alumnus **Richard G. Higgins, Maine Alpha '79**. President Simonson presented a commemorative plaque, and a TBPI scholarship of \$2,000 will be given in his honor to a student this spring.

Executive Director Transition

The Convention applauded granting the title of Executive Director and Secretary-Treasurer Emeritus to J.D. Froula by the Council and the presentation of the inaugural J.D. Froula Most Improved Membership Award to Missouri Beta with honorable mentions to Georgia Alpha, Nevada Alpha, and Arizona Gamma. Mr. Froula was further recognized and presented gifts from the Council and others—including a memory book, GPS, map of Mars, numerous ducks, and five bound volumes of *THE BENT* during the 29 years of his editorship.

ABOVE: Delegates to the 2011 Convention.

RIGHT: Executive-Director Emeritus Jim Froula, *TN A '67*, leads his successor, Curt Gomulinski, *MI E '01*, and the Convention in the traditional cheer.

FAR RIGHT: Does anybody have a napkin?

Other Business

The 106th Convention carefully handled all of the routine chores of the Society. The Chapter Development Program, including excellent Interactive Chapter Exchanges and Engineering Futures and District meetings, is reported in a separate article in THE BULLETIN. Many delegates expressed appreciation for the usefulness of the exchanges and the EF sessions. Delegates applauded the new 2011 Tau Beta Pi historical video during the Saturday banquet.

The *ad hoc* TBP K-12 MindSET Committee diligently reviewed the status of the K-12 MindSET Program, recommended the development of a model “MindSET Implementation Process,” and encouraged chapters to participate in the program.

The *ad hoc* Chapter Website Committee made recommendations to chapters regarding their websites, the Council, and to Headquarters regarding the “Chapter Website” section and suggested a new competition to create a template and structure for the appearance of the Association website at *tbp.org*.

Advisors met in a Chapter Advisor Forum to discuss ways to encourage and strengthen the collegiate chapters.

Alumnus chapter delegates met in an official forum, reported the strong support and immense potential of TBP alumni around the world, and asked the Council to establish an Alumnus Chapter Committee (*ad hoc*) for the 2012 Convention.

Special focus groups met on Saturday afternoon to discuss ways to improve Tau Beta Pi. Teams of Convention attendees led by national officials, volunteers, and staff shared their thoughts on the benefits of TBP membership and opportunities to stay involved as alumni.

Finally, the Resolutions Committee was responsible in thanking the host chapter members, officials, generous alumni and sponsors, award winners, Headquarters staff, volunteers, and others for all the good things that happened to Tau Beta Pi during the year and closing the Convention with a succinct inspirational message to the delegates, concluding as follows:

Assisted by . . .

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- Michigan Technological University Graduate School
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- Purdue University College of Engineering
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The Ph.D. Project



Thank you to everyone for being here; it is you who make this entire Convention and organization possible. It is only through your efforts that we are able to gather at a national level and conduct the business of Tau Beta Pi. This is an organization of fantastic potential. We look forward to next year and to the continued achievements of every Tau Bate.



National Awards

Outstanding Chapter: Michigan Epsilon

Michigan Epsilon at Wayne State University was named the R.C. Matthews Outstanding Chapter for 2010-11.

The Award Committee stated that Michigan Epsilon best fulfilled the objectives of TBI over the year with its “incredible membership program, the significant involvement of advisors in chapter affairs, exceptional fundraising, and strong community outreach.”

The chapter conducted a total of 37 projects. Members planned and participated in a wide range of activities, ranging from helping with Susan G. Komen breast-cancer walk-for-the-cure to having electees make a rubbing of the Faith of the Engineer plaque.

They continued with many of their most successful activities: a college-wide tutoring program, a meet-the-college luncheon to promote the chapter and provide opportunities to meet each other, and a poker fundraiser. Members planned and took part in many new events, including the walk-for-the-cure, a holiday food drive, and lending a hand at the Gleaners community food bank. New and past officers and other members together prepared the annual survey. This combined effort produced a thorough report of all the chapter activities, which future officers can use to plan events.

Michigan Epsilon leaders last year were President Eric M. Gingrich, Vice President Sarah B. Wood, and Treasurer Sean M. Lechkun. Chief Advisor is Dr. Michele J. Grimm.

The honorable mention went to **California Alpha** at the University of California, Berkeley.



Katie M. Latimer, Michigan Epsilon President, accepts the Outstanding Chapter Award from Award Committee Vice-Chair Vahagn F. Yeranossian, Ohio Alpha.

Most Improved Chapter: California Tau



California Tau President Jinwan Kim is congratulated by Award Committee Chair Abigail R. Wooldridge, Kentucky Beta.

The R.H. Nagel Most Improved Chapter Award was established in 1971 to recognize major improvement in chapter development.

The 2010-11 recipient is **California Tau** at the University of California, Irvine. The Award Committee recognized a great increase in the quality and quantity of chapter projects, which were really creative.

The academic year saw more than 70 events organized by the chapter. These ranged from cleaning neighborhood streets in a zero-trash project to helping create a greener environment by working with Shadetree.

The Award Committee was especially impressed with the documentation of projects. All this effort indicated a well-organized chapter that had made significant improvements over a three-year period.

Advisors were Dr. Farghali A. Mohamed, Dr. Ali Mohraz, Said M. Shokair, and Dr. Lorenzo Valdevit.

Honorable mention went to **Tennessee Gamma** at Tennessee Technological University.

2011 Convention

Improved Membership: Missouri Beta

The Headquarters staff and Executive Council have established the new J.D. Froula Most Improved Membership Award to honor the retiring Executive Director, Secretary-Treasurer, and Editor.

Mr. Froula presented the inaugural award to **Missouri Beta** at the Missouri University of Science and Technology.

Honorable mentions went to Georgia Alpha, Nevada Alpha, and Arizona Gamma.

The award recognizes the chapter which has increased the number of electees initiated in each of the previous three years. Other considerations are the percentage increase and number of initiates.

Several years ago Jim started a campaign challenging chapters to “Initiate One More” electee than in the previous semester. He encouraged them to do so without compromising our standards. Membership has seen a steady increase during those years, and it was, therefore, deemed appropriate to name a Most Improved Membership Award in Jim’s honor.



Missouri Beta President Rachel E. Downen is congratulated by Executive Director James D. Froula.

53 Chapters Recognized

Assistant Secretary Roger Hawks presented commendations to these chapters for membership improvements in 2010-11:

Alabama Alpha	Michigan Alpha
Alabama Epsilon	Michigan Delta
California Alpha	Michigan Epsilon
California Epsilon	Michigan Kappa
California Kappa	Nebraska Alpha
California Lambda	New Hampshire Beta
California Mu	New Jersey Alpha
California Omicron	New York Alpha
California Rho	New York Gamma
California Tau	New York Mu
California Upsilon	New York Xi
California Psi	Ohio Iota
California Omega	Ohio Nu
Colorado Beta	Oklahoma Alpha
Connecticut Alpha	Oregon Gamma
DC Beta	Pennsylvania Beta
DC Gamma	Pennsylvania Kappa
Florida Gamma	Rhode Island Alpha
Florida Eta	Tennessee Epsilon
Georgia Alpha	Texas Delta
Illinois Alpha	Vermont Alpha
Illinois Zeta	Vermont Beta
Indiana Gamma	Virginia Delta
Iowa Alpha	Virginia Epsilon
Maryland Beta	Washington Beta
Massachusetts Alpha	Washington Gamma
Massachusetts Delta	

\$9,000 in Scholarships

Eighteen chapters, each of which have won Chapter Project Awards for three consecutive years, won \$500 scholarships.

CHAPTER	INSTITUTION	DELEGATE
Alabama Epsilon	University of South Alabama	Quan T.D. Tran
California Alpha	University of California, Berkeley	Austin M. Bly
California Psi	University of California, San Diego	Akshay S. Chaudhari
District of Col. Alpha	Howard University	Desayo O. Ajisegiri
Florida Alpha	University of Florida	Meghan C. Ferrall
Florida Gamma	University of South Florida	Leah A. Bravard
Iowa Alpha	Iowa State University	Aaron G. Kilstofte
Michigan Gamma	University of Michigan	Daniel P. Kiefer
Michigan Epsilon	Wayne State University	Katie M. Latimer
Minnesota Alpha	Univ. of Minnesota—Twin Cities	Margaret G. Goshert
New Mexico Gamma	New Mexico Inst. of Mining & Tech.	Alyssa J. Rose
New York Tau	Binghamton University	Alexander N. Hantman
Ohio Iota	Ohio Northern University	Jeffrey B. West
Ohio Kappa	University of Akron	Sunandini Chopra
South Carolina Alpha	Clemson University	Jackson G. Turbeville
South Dakota Alpha	SD School of Mines & Technology	William H. Lichtenwaldt
Texas Alpha	University of Texas at Austin	C. Matthew Pool
Wyoming Alpha	University of Wyoming	Mallory K. Hunt

2011 Convention

30 Chapter Project Awards

At the 2011 Indianapolis Convention, Executive Director Jim Froula presented Chapter Project Awards for outstanding performance during 2010-11 to the following 30 chapters:

Ray Thompson, TIBT

CHAPTER / INSTITUTION	NO. PROJECTS	CHAPTER / INSTITUTION	NO. PROJECTS
AL E University of South Alabama • Recognized the outstanding sophomore • EYE: Engaging Youth in Engineering in grade schools	17	MI Γ University of Michigan • Conducted several MindSET sessions • Enjoyed winter weather while cleaning an arboretum	53
CA A University of California, Berkeley • Rebuilding Together: Improved elderly woman's home • Worked to restore Strawberry Creek	58	MI E Wayne State University • Electees made rubbing of "Faith of the Engineer" plaque • Helped Race for the Cure	37
CA E University of California, Los Angeles • Hosted K-12 students at the on-campus Science Corp. • Volunteered at Westwood Horizons Retirement Home	42	MI Θ Oakland University • Participated in Detroit-area pre-college engineering program • Guided tours for engineering & computer science school	16
CA Σ University of California, Santa Barbara • Promoted family ultimate science experience • Planted trees in the Santa Barbara community	14	MI I University of Michigan–Dearborn • Organized and hosted regional Science Olympiad • Tutored fellow students	21
CA T University of California, Irvine • Helped create a greener environment with Shadetree • Worked to achieve zero-trash Newport	41	MN A University of Minnesota–Twin Cities • Packed meals for feed-my-starving-children program • Collected to purchase engineering-related Toys for Tots	25
CA Ψ University of California, San Diego • Won first prize in the Rube Goldberg contest • Volunteered and had fun at Hacienda Orphanage	56	NM Γ New Mexico Institute of Mining & Technology • Designed test as part of the state Science Olympiad • Adopted a highway	13
CO A Colorado School of Mines • Tutored high-school students • Held MindSET session at Bell Middle School	20	NY T Binghamton University • Helped collect blood for Red Cross—60 participants • Helped children enjoy Boo at the Zoo	20
DC A Howard University • Participated in USA Science and Engineering Fair • Helped restore historical fence in south-east district	7	OH I Ohio Northern University • Helped at Ada High School regional quiz bowl • Helped light Ada Park for Christmas	24
FL A University of Florida • The project that started MindSET–GatorTRAX • Hosted SECME Olympiad	43	OH K University of Akron • Repaired toys for kids with disabilities—Replay for Kids • Volunteered at national park on make-a-difference day	16
FL Γ University of South Florida • Volunteered at Museum of Science and Industry • Helped at the Relay For Life	28	SC A Clemson University • Participated in solid-green clean-up • Hosted engineering expo for engineering & science week	13
GA A Georgia Institute of Technology • Helped Historic District Development Corporation • Helped give meals to people with health conditions	38	SD A South Dakota School of Mines & Technology • Kept a section of the highway clean • Conducted a MindSET project at local elementary school	11
IL A University of Illinois at Urbana-Champaign • Volunteered time at the Champaign Public Library • Won competition to collect most items for food bank	29	TN Γ Tennessee Technological University • Helped middle-school students at campus STEM center • Tutored math and science at a local alternative school	8
IA A Iowa State University • Held annual catapult competition • Gave 150 kids a hands-on introduction to engineering	29	TX A University of Texas at Austin • Cleaned up the Barton Creek greenbelt • Improved low-income housing energy efficiency	67
MDB University of Maryland • Worked with Habitat for Humanity in New Orleans • Assisted at the Maryland Science Bowl	41	WV A West Virginia University • Purchased bicycle helmets for underprivileged children • Adopted a highway	23
MDE Morgan State University • Participated in a regional MindSET training session • Helped to "Introduce a Girl to Engineering"	15	WY A University of Wyoming • Organized and hosted the engineering honors banquet • Helped high-school students stay "Upward Bound"	11

Contributors to 2011 Alumnus Giving Program

The names of 8,714 Tau Beta Pi alumni who made donations to the Association in the 2011 Alumnus Giving Program appear in two separate sections on the following pages. Their gifts totaling \$672,876 arrived between February 1 and November 15, 2011. Gifts received after November 15 do not appear here but will be published in the Spring 2012 BENT.

The generous assistance of each member is deeply appreciated by the Executive Council and other national officers of the Association. The financial resources have permitted strengthening our programs in several areas that emphasize the importance of Tau Beta Pi's basic objectives and that help all collegiate chapters and student members.

Donors' names in the special section beginning on page 41 are arranged alphabetically within their chapters. Names of members who have qualified for the Tau Beta Pi Donor Recognition Clubs are listed only in the first section immediately below. Names followed by an * participated in Cleve Campbell's match. Names marked with a † symbol are of deceased members in whose memory donations were made either by relatives and friends or through bequests. In addition to the gifts acknowledged here, several were made anonymously through the Combined Federal Campaign or JustGive and are also deeply appreciated. Matching entities are listed on page 45.

Recognition Club Donors

The names of 6,279 Tau Bates appear in this first section. They made donations to the 2011 Alumnus Giving Program between February 1 and November 15, 2011, and they have also made contributions and bequests to Tau Beta Pi through the years totaling from \$250 to more than \$700,000.

The Donor Recognition Clubs are part of our effort to recognize a donor's total lifetime cumulative giving to Tau Beta Pi. Such continuous support significantly contributes to the overall strength of the Association and allows our Society, with confidence in our financial resources, to plan for modest growth in our services to the engineering profession. These clubs were chartered by the Executive Council in 1986 and have been set at the following levels:

Matthews Club	\$500,000	Alpha Club	\$25,000	Chi Club	\$1,000
Nagel Club	250,000	Beta Club	10,000	Second Century Club	500
Williams Club	100,000	Delta Club	5,000	Founder's Club	250
Heikes Club	50,000	Zeta Club	2,500		

MATTHEWS CLUB

CA † Forge, Charles O. '56

WILLIAMS CLUB

IN A Bechtel Jr., P.E., Stephen D. '46
VA B Anonymous '49

HEIKES CLUB

NY E Lynnworth, Lawrence C. '58

ALPHA CLUB

CT A Soderberg, Peter H. '68
IN A Forney, Robert C. '47
IN A Koller, David C. '62
MI † Fox, Gordon B. '53
TX A Rothrock, Ray A. '77
WVA Clutter Jr., James H. '70

BETA CLUB

AZ B Myers, Gerald E. '70
CA B Henigson, Robert '48
CA † Davies III, Paul L. '83
CA A Anderson, Vincent C. '83
Mieczko, Eugene L. '47
CO B Hasund, Svein H. '67
Teets, Peter B. '63
IN A Clements, David '80
LA † Kitchens, Phillip H. '67
MD B Wilson, William R. '49
MI B Brule, David J. '72
NY † Rice, Joseph A. '48
NY A Wright, Peter A. '75
NY E Hollander, P.E., Lawrence J. '51
NY K Knox, Keith T. '70
NY E Denning, Peter J. '64
OH B Barthel, Gerald R. '67
OH † Mahaffey, Jack L. '54
RI B Brennan Jr., John F. '81
Keddie, William J. '59
SC B Brandel, William J. '52
SD A Gomulinski, Tricia E. '98
TN A Holmes, M.D., William S. '78
TX A Schulte, Francis L. '49
TX † Loewenstern Jr., Walter '59
TX H Taylor, Lee D. '68
Trich, John A. '70

DELTA CLUB

AL A Brackney, William M. '58
OH E Pierce Jr., P.E., D. Stephen '90
AK A Stella, Damien F. '82
AR A Brotherton, Robert H. '67

CA A Masatani, Peter-James '04
CA B Marshall III, J. Howard '57
CA † Johnson, F. Martin '58
Kennedy, Robert P. '61
CA A Hadley, Arthur H. '49
Seltzer, Sol '50
CA E Case, Daniel K. '87
CA † McClay, Michael D. '73
CA N Joy Jr., Robert L. '66
CO A Armentrout, Michael Lee '94
CO B Kinzie, Edward O. '64
CT B O'Brien, Donald J. '51
DE A Gushall, Thomas L. '60
Sharp III, H. Rodney '60
FL B Robert, Raymond W. '66
FL E Faske, David G. '85
IL B Gendron, Roger J. '55
Miyasaki, John K. '54
IL † Johnson, R. Douglas '62
Rasmussen, Warren W. '53
IN A Davidson, Charles D. '72
Grimm, Robert A. '50
Radewan, Clark H. '65
Wainscott, William S. '48
IN † Rice, Donald B. '61
IN E Dausman, P.E., Alan V. '77
IA A Burmeister, Jon B. '68
Smith, Richard J. '69
IA B Fleming, John R. '50
LA A Longwell Jr., Harry J. '63
Olivier, Donald A. '51
LA B Evans, Frederick A. '50
LA † Baldwin Jr., George A. '78
Rivers, John V. '63
MDA Goudy, Paul R. '38
Hackerman, Willard '38
Mao, David Chu-Chih '00
MAB Koch, William L. '62
MAA Drazetz, Abraham '44
MAE Holm, John W. '43
MAH Garriques, Ronald G. C. '86
Sin, Chi-Kai '88
MI B Meyers, James P. '52
MI † Clark, Walter B. '69
Telking, P.E., John T. '62
MI E Lahti, P.E., Gerald P. '59
Strebendt, Richard E. '65
MI Z Haun, Ross M. '54
Thebert, Alan '57
MNA Swalin, Richard A. '52
MS A Sinclair, William P. H. '63
MO B McHenry, S. Dale '81
MT A Melnick, Charles H. '41
NJ B Dunlop, Robert B. '50
NJ † Kenney, Thomas E. '70
NY A Florman, P.E., Samuel C. '44
Mayer Ernest '62
NY B Fleisher, Richard S. '72
Frantz, William T. '80
Morris, Isaac A. '41

NY † DeGhetto, Ph.D., Kenneth A. '50
Gorin, Ralph E. '70
NY A Mendenhall, William W. '48
NY Z Friend, William L. '56
NY † Cohen, Bernard '54
NC † Kennedy, Theodora C. '52
OH A Herke Jr., Frederick P. '54
Salamon Jr., Peter F. '71
OH B Eggleston Jr., Robert F. '74
OH † Kolbas, John M. '47
OK A Foster, P.E., Charles E. '61
OK † Wear, Steven M. '85
OB A Lundeen, Robert W. '42
PA A Brunner, Thomas M. '63
PA B Norton, Richard S. '57
PA A Harker, Patrick T. '81
PA Z Abriola, Joseph L. '48
Feldbaumer, William C. '51
PA A Schuler, Joseph J. '80
SC B Diele, Leslie N. '71
SC † Good, Mary Lowe '50
TN A Goodrich, P.E., Henry C. '43
Wilson, Wayne '77
TN † Hall, Kristofer Brian '98
TX A Mickelson, P.E., Kent B. '77
TX † Wilson, Richard O. '56
TX A Fox, Craig A. '77
Mitchell, George P. '40
Richardson, John E. '71
Sisney, Steven L. '83
TX E Sifton, Randal W. '85
TX A Beal, Barry A. '65
UT A Ramo, Simon '33
VA A White, R. Dudley '76
VA B Hogan, James C. '70
WAA Asplin, Lyle I. '59
Beall, P.E., Richard L. '77
Peterson, Donald E. '46
Pierce, Russell W. '70
Swanson, P.E., Hilmer S. '76
WVA Baker, David W. '76
WI A Grainger, David W. '50
WI † Cronce, Richard G. '77

ZETA CLUB

AL A Bowers, Charles J. '69
Griffith, Gordon H. '57
Spurlock Jr., Jerry '72
Wilhelm, William J. '58
AL B Drummond, Garry N. '61
Mosley, Talmadge '65
AL † Hamner, George F. '39
Robins, Todd '37
AL A Fogle, Frank R. '80
AK A Gaddis, P.E., B. L. '73
AZ A Anonymous '56
Milan, John M. '67
AZ B Jarvi, Theodore C. '66
AR A Gammill, Edward L. '50

Gunderman, Tony R. '89
Vratsinas, P.E., Gus M. '67
CA A Boyd, Lawrence E. '56
Ikeda, Kenneth A. '62
Keith, Edward J. '61
CA B Drowley, Clifford I. '75
CA † Calker, William H. '41
Davis Jr., Joseph S. '59
Fowle, Mark C. '76
Fuller, Robert O. '51
Jedenoff, George A. '40
Trane, Frank H. '53
Tyson Jr., USN Ret., James J. '58
CA A Cozens, Eric T. '48
James J. '58
IN B Nelson, Thomas A. '49
CA E Sipma, Dale M. '67
CA Z Fisher, Dean L. '75
Peters, Robert W. '61
CA H Crotchett, Denton R. '71
Noble, Gary D. '96
CA † Smith, Gregory W. '75
CA K Ratcliffe, Alfonso F. '51
CA A Coombs, Richard A. '75
Domming, Edward E. '84
Erickson, Ralph E. '71
Lytle, Scott K. '86
CA E Boyd, Robert A. '74
Hickey, Robert W. '88
Robe, Charles E. '79
CA Y Mukhar, Marwan John '93
Neuman, William R. '61
CO A Hickman, Richard L. '65
Musser, Jack W. '72
CO B Kern, Robert E. '43
Kidd, T. Wayland '44
CO A Landseidel, Mark E. '82
CT B Killingbeck, David R. '77
Lof, John L. C. '38
DE A Hyer, Frank S. '58
DC † Cooper, Reid F. '77
FL A Plumb, Russell A. '76
FL B Messulam, Aldo J. '67
GA A Farr, Emory W. '54
Jenkins, William C. '68
ID A Frohnen, David J. '83
IL A Baits, Paul G. '79
Beernink, Kurt P. '82
Luzbetak, Paul Daniel '96
Parker Sr., Paul E. '61
Robertson, John A. '65
Wait, Jay J. '71
IL B Bernhardt, John Edward '89
Carter, David W. '68
Clewell, Thomas Alan '88
IL † Crown, Lester '46
Dixon, David A. '63
Gross, Richard C. '80
IL Z Allendorfer, Robert K. '83
IN A Avril, Thomas B. '45

Barany, James W. '53
Barker, Kenneth D. '64
Christensen, Billy C. '50
Crockett, Christine H. '79
Murdock, Jay H. '51
Orr, Billy E. '56
Palas, Richard F. '65
Reitz, Richard A. '63
Sherman, Robert '49
Teague, Stephen M. '71
Todd, Zane G. '51
Vosteen, Louis F. '52
Watkins, Eugene A. '52
IN B Conn, Richard L. '76
IN † Jackewicz Jr., Joseph I. '75
Poore, Michael F. '71
IN A Brandt, Daniel M. '74
Carlson, Mary Perese '78
Harms, Richard F. '65
Jacobson, Allen F. '47
Krambeck, Scott D. '82
Peterson, Michael L. '89
Pride, Richard A. '47
IA B Carson, David N. '54
Small, Warren L. '57
KS A Mitchell, James E. '85
Powell, Ricky S. '80
KS B Mueller, Robert L. '67
Patton, Robert E. '70
KS † Fowler, Eddie R. '57
Hefty, Keith W. '87
KY A Gould, William H. '61
KY B Arbaugh, Andrew Carey '95
LA A Schweizer, Charles B. '36
LA † Mohr, James D. '55
ME A Gordon, Richard O. '36
Johnson, Christine E. '82
MDB Beard, James L. '67
Booth, Andrew W. '64
Baker, Martin M. '56
Burgio, Robert B. '87
Crane, Thomas C. '62
De Oms, James H. '68
Farmer, Nick A. '68
Owings, USA Ret., James B. '55
Thompson, Leslie L. '66
MAB Godrej, Adi B. '63
Hirsch, Alan R. '66
Macht, Phillip R. '48
McInnes, Harold A. B. '49
MAA Coutts, Robert B. '72
Patin, Murray S. '64
Peterson, John W. '53
Welch, Albert F. '48
MAE Dipietro, William O. '42
Mahoney, John J. '56
MAZ Borascki, Nicholas '50
Lewis, Nelson D. '76
Poulin, James E. '68

ZETA CLUB, CONTINUED

MI A	Walker Jr., William E. '57 Bozian, Edwin B. '50 Colby, Ph.D., Dirk J. '06 Colby, Ph.D., Kathleen Luchini '99 Smith, Harry '64 Spindler, Jeffrey D. '79	TX A	Clark, Glynn A. '48 Dorr, Lawrence D. '68 Igelhart, Donald R. '48 Sarver, John L. '51 Wells, Roger M. '71	CA A	Yost Jr., Frank M. '40 Bruce, Steven R. '78 Duckworth, John E. '66 Farwell, Robert J. '50 Fernandez, Ferdinand F. '58 Fong, Franklin M. '69 Holcombe, Richard P. '51 Moulton, James R. '54 Slafar, Loren J. '68 Auerbach, Albert H. '50 Bramblett, George C. '59 Brunton, Daniel W. '78 Dobbs, Michael W. '66 Endo, Frederick Y. '57 Evdouh, Viktor '67 Gorton, James D. '63 Goss, John R. '79 Griffin, Eugene C. '63 McCauley, Robert J. '65 McDonnell, John D. '60 Perrine, Richard L. '49 Rifkin, P.E., Allyn D. '72 Schnur, Herman W. '82 Spencer, Donald K. '74 Warner Jr., John H. '63 Yoshizumi, Steven A. '88	IN F	Shacter, Philip '79 Thompson Jr., John P. '77 Uhlir, Robert B. '74 Walding, Joseph P. '51 Dauer, Edward A. '72 Ball, Arthur M. '70 Caramalis, Nicholas '75 Dip, Anthony '86 Emerson, Michael J. '83 Fleming, Gerald P. '56 Jones, William D. '74 Lyons Jr., Thomas F. '76 Skemp, Susan H. '81 Smith, Larry M. '87 Akridge, G. Russell '62 Austin, Edward M. '66 Kishonh, Jefferson L. '66 Espy, Goodman B. '57 Fawcett, Clinton Douglas '92 Gilliland, Clinton R. '59 Hancock, John L. '48 Henderson, Richard D. '53 Kaduck Jr., William W. '76 Lorenzo, Donald K. '77 Mowrey, Daniel B. '65 Sifton, John H. '88 Marks Jr., John R. '77
MI B	Burchfield, Jack E. '56 Halverson, Mark W. '72 Hopping, William D. '71 Sarns, Richard J. '76	TX B	Carey, Martha D. '80 Glenn, Stephen W. '66 Green, Chester A. '46 Seaburg, Laidacker M. '69	CA E	Goss, John R. '79 Griffin, Eugene C. '63 McCauley, Robert J. '65 McDonnell, John D. '60 Perrine, Richard L. '49 Rifkin, P.E., Allyn D. '72 Schnur, Herman W. '82 Spencer, Donald K. '74 Warner Jr., John H. '63 Yoshizumi, Steven A. '88	IN A	Eppler, Michael P. '85 Fleuve Jr., Frederic W. '67 Luecke, Edgar J. '55 Runge, Lambert J. '58 Vocke, Marilyn C. '55
MI F	Burchfield, Jack E. '56 Halverson, Mark W. '72 Hopping, William D. '71 Sarns, Richard J. '76	TX F	Allen, James B. '44 Hedrick, O. F. '44 Jordan, Paul Joseph '90	CA Z	Going Jr., E. Jackson '49 Battersby, Donald H. '58 Lampe, Fred P. '79 Ephgrave, R. Ian Jr. '59 Nulk, Robert A. '58 Perrin, Michael E. '67 Wagner, Michael J. '69 Akers, Joe L. '69 Hines, John W. '56 Kaduck, Alan B. '51 Knox, Thomas D. '86 Krupka, John F. '52 Magnuson, William L. '60 Nelson, Gordon K. '51 Nolte, Kenneth G. '64 Schub, Linda G. '55 Slater, Eric K. '67 Snyder, Dan W. '50 Tataru, Richard M. '78 Tirpak, Thomas M. '87 Tomasic, Michael G. '66 Vogel, Frederick M. '80 Waranuskas, Amy B. '85	IN E	Liechty, Douglas L. '73 Amos, L. Lyeal '69
MI G	Burchfield, Jack E. '56 Halverson, Mark W. '72 Hopping, William D. '71 Sarns, Richard J. '76	TX G	Allen, James B. '44 Hedrick, O. F. '44 Jordan, Paul Joseph '90 Baumgartner, Yoanna '84 Clinton Jr., P.E., Daniel D. '52 Johnson, Dennis R. '74 Latham, Raymond E. '56 Mathis, James F. '46 Porter, Larry G. '64	CA H	Akers, Joe L. '69 Hines, John W. '56 Kaduck, Alan B. '51 Knox, Thomas D. '86 Krupka, John F. '52 Magnuson, William L. '60 Nelson, Gordon K. '51 Nolte, Kenneth G. '64 Schub, Linda G. '55 Slater, Eric K. '67 Snyder, Dan W. '50 Tataru, Richard M. '78 Tirpak, Thomas M. '87 Tomasic, Michael G. '66 Vogel, Frederick M. '80 Waranuskas, Amy B. '85	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI H	Burchfield, Jack E. '56 Halverson, Mark W. '72 Hopping, William D. '71 Sarns, Richard J. '76	TX H	Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66	CA I	Haan, George T. '69 Schuler, David W. '82 Thomsen, Jonathan W. '69	IN E	Liechty, Douglas L. '73 Amos, L. Lyeal '69
MI J	Dynal, Raymond C. '70 Jordan, Gary L. '73	TX J	Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA M	Brownell, Michael P. '84 Tucker, Nancy C. '89 Marsh, William C. '82 McCroskey, William T. '71 Savage, Homer E. '74 Shimokawa, Reyn Yukio '95 Snow, Terry M. '76 Hendrix, Edward H. '75 Marcellin, Michael W. '82 Wong, Frank '79	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI K	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX K	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA N	Marsh, William C. '82 McCroskey, William T. '71 Savage, Homer E. '74 Shimokawa, Reyn Yukio '95 Snow, Terry M. '76 Hendrix, Edward H. '75 Marcellin, Michael W. '82 Wong, Frank '79	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI L	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX L	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA O	Hinker, Fred L. '69 Lawson, Wayne A. '68 Miller, Betty L. '47 Goss Jr., William E. '72 Debbink, John D. '49 Delucca, Gregory J. '59 Yee, Paul Yuen-Po '70 Boyle, Richard J. '57 Davidson, Steven L. '80	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI M	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX M	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA P	Steinberg, Dennis P. '72 Anderson, Eric K. '79 Kraft, Lytle D. '87 Stoller, Roger E. '78 Fable, Scott Edward '96 Dawson, P.E., Carole S. '85 Grappe, Nancy T. '88 Idemill, Ethan Matthew '04 Shelly, Ronald W. '62 Alfred Jr., Ivan D. '59 Maurer, Mike A. '87 Peterson, Richard D. '80 Rene, John A. L. '74 Van Dinter, Jennifer Ann '97	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI N	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX N	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA Q	Hudson Jr., Frederick J. '53 Hunkler, Robert N. '88 Pitkin, Edward T. '52 Staiger, Eugene H. '57 Zajac, Gerald E. '68 Dell, Gregory A. '72 Kershner, Christine A. '79 Locke, David W. '43 Swope, Richard D. '60 Winer, Harley S. '81	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI O	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX O	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA R	Engram, Robert L. '69 Gilliam IV, Isaac T. '53 Torain, Alfonso M. '59 Ford, Richard M. '49 King, David A. '68 Murphy, Joseph A. '60 Orzech, Joseph M. '71 Walsh, Bryan Patrick '97	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI P	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX P	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA S	Engram, Robert L. '69 Gilliam IV, Isaac T. '53 Torain, Alfonso M. '59 Ford, Richard M. '49 King, David A. '68 Murphy, Joseph A. '60 Orzech, Joseph M. '71 Walsh, Bryan Patrick '97	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI Q	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX Q	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA T	Davis, John M. '48 Hawley, Chester G. '47 Livingston, Robert M. '57 Merritt Jr., Thomas W. '50 Saubestre, Paul A. '79 Trotman, John E. '65 Verges, Hugo P. '49 Yamachika, Thomas '80 Bonazzo, Vincent A. '80 Cirella, Robert M. '85 Fitton, John J. '70 Hudson Jr., Frederick J. '53 Hunkler, Robert N. '88 Pitkin, Edward T. '52 Staiger, Eugene H. '57 Zajac, Gerald E. '68	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI R	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX R	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA U	Davis, John M. '48 Hawley, Chester G. '47 Livingston, Robert M. '57 Merritt Jr., Thomas W. '50 Saubestre, Paul A. '79 Trotman, John E. '65 Verges, Hugo P. '49 Yamachika, Thomas '80 Bonazzo, Vincent A. '80 Cirella, Robert M. '85 Fitton, John J. '70 Hudson Jr., Frederick J. '53 Hunkler, Robert N. '88 Pitkin, Edward T. '52 Staiger, Eugene H. '57 Zajac, Gerald E. '68	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI S	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX S	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA V	Davis, John M. '48 Hawley, Chester G. '47 Livingston, Robert M. '57 Merritt Jr., Thomas W. '50 Saubestre, Paul A. '79 Trotman, John E. '65 Verges, Hugo P. '49 Yamachika, Thomas '80 Bonazzo, Vincent A. '80 Cirella, Robert M. '85 Fitton, John J. '70 Hudson Jr., Frederick J. '53 Hunkler, Robert N. '88 Pitkin, Edward T. '52 Staiger, Eugene H. '57 Zajac, Gerald E. '68	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI T	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX T	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA W	Davis, John M. '48 Hawley, Chester G. '47 Livingston, Robert M. '57 Merritt Jr., Thomas W. '50 Saubestre, Paul A. '79 Trotman, John E. '65 Verges, Hugo P. '49 Yamachika, Thomas '80 Bonazzo, Vincent A. '80 Cirella, Robert M. '85 Fitton, John J. '70 Hudson Jr., Frederick J. '53 Hunkler, Robert N. '88 Pitkin, Edward T. '52 Staiger, Eugene H. '57 Zajac, Gerald E. '68	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI U	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX U	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA X	Davis, John M. '48 Hawley, Chester G. '47 Livingston, Robert M. '57 Merritt Jr., Thomas W. '50 Saubestre, Paul A. '79 Trotman, John E. '65 Verges, Hugo P. '49 Yamachika, Thomas '80 Bonazzo, Vincent A. '80 Cirella, Robert M. '85 Fitton, John J. '70 Hudson Jr., Frederick J. '53 Hunkler, Robert N. '88 Pitkin, Edward T. '52 Staiger, Eugene H. '57 Zajac, Gerald E. '68	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI V	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX V	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA Y	Davis, John M. '48 Hawley, Chester G. '47 Livingston, Robert M. '57 Merritt Jr., Thomas W. '50 Saubestre, Paul A. '79 Trotman, John E. '65 Verges, Hugo P. '49 Yamachika, Thomas '80 Bonazzo, Vincent A. '80 Cirella, Robert M. '85 Fitton, John J. '70 Hudson Jr., Frederick J. '53 Hunkler, Robert N. '88 Pitkin, Edward T. '52 Staiger, Eugene H. '57 Zajac, Gerald E. '68	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI W	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX W	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA Z	Davis, John M. '48 Hawley, Chester G. '47 Livingston, Robert M. '57 Merritt Jr., Thomas W. '50 Saubestre, Paul A. '79 Trotman, John E. '65 Verges, Hugo P. '49 Yamachika, Thomas '80 Bonazzo, Vincent A. '80 Cirella, Robert M. '85 Fitton, John J. '70 Hudson Jr., Frederick J. '53 Hunkler, Robert N. '88 Pitkin, Edward T. '52 Staiger, Eugene H. '57 Zajac, Gerald E. '68	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI X	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX X	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA A	Davis, John M. '48 Hawley, Chester G. '47 Livingston, Robert M. '57 Merritt Jr., Thomas W. '50 Saubestre, Paul A. '79 Trotman, John E. '65 Verges, Hugo P. '49 Yamachika, Thomas '80 Bonazzo, Vincent A. '80 Cirella, Robert M. '85 Fitton, John J. '70 Hudson Jr., Frederick J. '53 Hunkler, Robert N. '88 Pitkin, Edward T. '52 Staiger, Eugene H. '57 Zajac, Gerald E. '68	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI Y	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX Y	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA B	Davis, John M. '48 Hawley, Chester G. '47 Livingston, Robert M. '57 Merritt Jr., Thomas W. '50 Saubestre, Paul A. '79 Trotman, John E. '65 Verges, Hugo P. '49 Yamachika, Thomas '80 Bonazzo, Vincent A. '80 Cirella, Robert M. '85 Fitton, John J. '70 Hudson Jr., Frederick J. '53 Hunkler, Robert N. '88 Pitkin, Edward T. '52 Staiger, Eugene H. '57 Zajac, Gerald E. '68	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI Z	Hemp, Gene W. '61 Rush, Philip J. '43 Stanley, Steven Francis '84	TX Z	Mathis, James F. '46 Porter, Larry G. '64 Repscher, Kenneth W. '76 Sams, William N. '81 Nicholson, James E. '75 Barrett, Gerald G. '70 Sadauskas, Leonard '66 Brand, Ronald P. '60 Agosti, Steven J. '81 Wood, Sharon L. '82	CA C	Davis, John M. '48 Hawley, Chester G. '47 Livingston, Robert M. '57 Merritt Jr., Thomas W. '50 Saubestre, Paul A. '79 Trotman, John E. '65 Verges, Hugo P. '49 Yamachika, Thomas '80 Bonazzo, Vincent A. '80 Cirella, Robert M. '85 Fitton, John J. '70 Hudson Jr., Frederick J. '53 Hunkler, Robert N. '88 Pitkin, Edward T. '52 Staiger, Eugene H. '57 Zajac, Gerald E. '68	IN A	Amos, L. Lyeal '69 Ask, P.E., Andrew C. '64 Bercholtz, Nicholas E. '56 Davenport, Delbert J. '67 Derr, Curtis R. '85 Hammar, Kelly Jean '89 Hooversten, Estil V. '58 Hurl, Mary K. '47 Mankowski, Alan T. '68 Nanning, Thomas W. '64 Paris, Stephen W. '75 Petersen, Robert D. '62 Puffett, George E. '82 Ryan, Thomas E. '53 Schwenk, Vernon L. '60 Sellow, Roger C. '59 Shepherd, Kevin J. '83 Snyder, Merrill H. '68 Stout, Thomas M. '46 Wallace, Jean E. '81 Aron, Gert '58
MI A	Hemp, Gene W.						

CHI CLUB, CONTINUED

	Roberts, Carla Field '82	Khu, Eric B. C. '53	Plummer, Scott R. '81	NY Z	Spock, Robin E. '58	Deerhake, William F. '66
	Roberts, William M. '76	Liepa, Mark A. '81	Schmidt, Wayne W. '70		Gersten, Marvin C. '60	Fawcett, Sherwood L. '41
	Sabio, Vincent J. '86	Natvig, Anne Campbell '56	Stube, Milan R. '74		Labianca, Frank M. '61	Feltz, John F. '61
	Sayre Jr., Clifford W. '47	Niedelnuhr, Francis W. '50	Lovechick, John W. '80	NV A	Lopinto, Robert A. '67	Fling, Russell E. '49
	Simkins, Lee S. '77	Nobunaga, Alan S. '83	NVB	Nieling, John J. '90	Mendel, Jerry M. L. '59	Gardner, Dennis W. '69
	Smith, Richard B. '67	Nobunaga, Brian N. '83	NHA	Dyewicz, Vickie Sue '96	Present, Henry '67	Hall, P.E., Carl W. '48
	Stertzbach, Karl '72	Pendergast Jr., James F. '76		Stirk, James A. '81	Sommerfeld, Albert A. '48	Hancock, Sarah Ebert '86
	Trimble, Alan R. '71	Pendleton, Winston K. '62	NJ A	Alvey, Courtney D. '45	Tartanian, Charles N. '58	Howland, Smith E. '69
	Valencia, Jaime A. '74	Prescott, Thomas J. '69		Barnes, Robert G. '50	Willis, Paul A. '58	Johnston, Robert P. '67
	Wilson, Ronald A. '68	Root, James W. '54		Bendelius, Arthur G. '58	Zieve, Robert '55	Kersterizer Jr., J. Howard '49
	Yerkes, Michael A. '70	Scott, Richard A. '57		Brechta, Thomas M. '73	Goodman, Alvin S. '44	Layman, Timothy S. '72
MD I	Merritt Jr., Charles R. '85	Smithies, Henry '49		Compton, Joanne B. '79	Kaplan, Howard R. '55	March, Michael R. '85
MA A	Achilles, Heather D.M. '83	Stuart, Glenn A. '51		Doddy, John J. '86	Kopp, Eugene H. '50	Milligan, George C. '50
	Andrews, William G. '84	Subramanian, Suresh '88		Forslund, Donald C. '60	Morschler, Mark J. '89	Morscher, Mark J. '89
	Chappell, Harry F. '54	Trankle, Thomas L. '71		Gorog, Russell M. '70	Orkins, James E. '66	Ouellette, Andrew L. '86
	Cocks, Samuel W. '48	Trojan, Paul K. '55		Hoyt III, John G. '76	Overmyer, Ray A. '73	Pass, Brian C. '86
	De Andrea, Paul J. '75	Trost, Cecilia A. '78		Kronfeld, David '73	Riedel, Nelson A. '67	Rabinette Jr., William H. '68
	Descoteaux, Kenneth Gerard '89	Vlasic, Robert J. '49	MI A	Schell, Robert D. '74	Roll, Ronald E. '59	Schauwecker, Harry E. '52
	Downs, Allen G. '75	Wackenhut, Thomas C. '69		Schmidt, Arthur J. '68	Sing, Edwin '47	Stacy, Edward '43
	Fenner, Peter R. '64	Caste, Richard A. '68		Seventko, M.D., Joseph M. '60	Stoll, Eric D. '61	Story, G. Cook '68
	Gudewicz, Thomas M. '78	Culver, Walter '60		Turczyn, Terrence J. '75	Vercellino, Ray D. '48	Wolff, Mark F. '88
	Horrigan, Lawrence B. '56	Dolan, William J. '62	NJ B	Van Court, Donald P. '50	Widmann, Bradley H. '69	Beach, Ph.D., P.E., Theodore L. '87
	Hugelbank, Mark '68	Eberl, Edward G. '74		Berial, William M. '77	Williere, Paul M. '50	Gotolski, William H. '46
	Oakes, Michael W. '77	Kersich, Albert T. '52		Borovec, Ronald B. '79	Calkin, Edwin T. '61	Miller, Prusled '49
MA B	Sigety, Elizabeth P. '75	Ponticello, John C. '78		Boysen, Robert L. '83	De Fazio, Michael J. '67	Moss, Cruse Watson '48
	Ball, N. Addison '60	Rollinger, Charles N. '57		Chin, Donald J. '62	Fischer, George A. '54	Duska, Steve '51
	Broughton, William J. '61	Rose, M.D., Ph.D., Jonathan D. '81		Howell, Jeffrey M. '68	Murin, Peter A. '78	Coska, Rudolph A. '59
	Coburn, Joseph L. '61	Rossi, Nicholas M. '63		Huetig, Fred R. '50	Neuschaefer, Howard E. '65	Kubala, Andrew O. '63
	Detmer, Robert G. '55	Rutherford, Charles R. '53		Page, Robert H. '49	Trentacosta, Joseph D. '69	Rogers, William M. '53
	Giaino III, Edmond J. '74	Rutkowski, Paul J. '59		Rice, Darren J. '49	Weiss, Gerald '68	Armstrong, Chris K. '90
	Grossweiler, Philip J. '72	Wall, Raymond J. '50		Rodgers, Douglas N. '67	Wernau, William C. '68	Armstrong, Ellie R. '01
	Honke, Benjamin K. '63	Wittman, Bernard A. '64	MI E	Schelke, P.E., Joseph A. '51	Brown, George A. '48	Bliss, Douglas P. '75
	Insera, Beniamino A. '57	Boileau, Ph.D., James M. '87		Sharkey, John M. '84	Coleman, Thomas G. '62	Novak, Eugene C. '59
	Kellogg, John H. '48	Brooks, Vern E. '60		Starr, James W. '73	McGark, Leon H. '59	Pyers, Dean H. '84
	Klein, Harrison J. '71	Chudd, Richard A. '66		Wandergirt, Wayne J. '47	Mastro, Noreen L. '79	Rose, John D. '82
	Kornafel, Peter R. '65	Doughy, Robert E. '65	NJ F	Wurtz, Robert '82	McGurk, Leon H. '59	Tenney, P.E., Thomas H. '67
	Mandell, Gordon K. '69	Durisin, Michael J. '81		Angyal, Stephen '63	Rudin, Murray E. '83	Hobby, Richard L. '74
	Marks, Lloyd A. '71	Husak, Philip W. '72		Benson, Robert J. '65	Kern, P.E., Peter L. '62	Fisher, Jack D. '74
	Martel, Philip O. '72	Morin Jr., Dornis C. '48		Dehn, Rudolph A. '41	Petsche, Frank '78	Fraass, Ronald G. '78
	Nobel, Sanford M. '58	Mutzelburg, Ronald E. '68		Dickson, W. Henry '50	Rubens, Roger W. '49	Grossing, Randall V. '72
	Oien, Harley M. '70	Szafanski, Joseph P. '66		Dooley, Ronald M. '64	Widmann, Bradley H. '69	Lentz, Ward J. '63
	Patterson, John R. '68	Walker, James H. '41	MI Z	Cauba, John S. '83	Montgomery, Michael E. '75	Lehmann, William L. '44
	Pershing Jr., John A. '75	Kovacs, Robert L. '86		Ehrgott, Marlin C. '49	Galwey, Timothy J. '80	Liske, Robert '68
	Petrofsky, Alfred M. '50	McEwen, Stephen N. '54		Fenster, Saul K. '53	LaRosa, Anthony P. '77	Murawinski, Daniel J. '77
	Quick Jr., Roy F. '70	Quaid, Richard C. '65		Guttenberg, D.Sc., William S. '44	Marso, Rudolf '59	Nelson, James R. '65
	Schmitt, Ralph G. '66	Slovesko, Shawn Michael '97		Knight, Ralph M. '39	Mendell, Todd '74	Schneider, Ph.D., Greg R. '80
	Simpson, Richard A. '67	Steffe, Alan K. '68		Mandle, John B. '52	Murphy, Vincent G. '62	Stolberg, Carl G. '57
	Smith, Alan J. '71	Volpe, David R. '74		Mauerweyer, Henry A. '72	Korke, George L. '71	Stubs, John F. '65
	Smith, Robert P. '50	Wright, Hugh D. '55	MI H	Mozda, Stanley M. '69	Runowich, Carl J. '84	Sweated, James '82
	Strauss, Richard A. '60	Colegrove, Jon K. '80		Pecca Jr., John A. '87	Courter, Jeanne L. '75	Beimesch, Wayne E. '68
	Venturini, Eugene L. '67	Czupinski, Glenn W. '83		Riede, Bruce E. '67	Farrell, Timothy M. '82	Doyle, James T. '65
	Viterbi, Andrew J. '57	Horltd, P.E., Henry B. '47		Rock, Jeffrey F. '79	Putnims, Zigmunds A. '78	Fuemmeler, Jason Alan '00
	Vlahakes, Gus J. '71	Johncox, Robert A. '83	MI I	Terry, Frederic T. '67	Ruffalo, Michael J. '87	Simpson, Gerald F. '68
	Wilson Jr., Albert O. '38	Papp, Gregory V. '82		Tucker, John H. '67	Venezia, Frank Bennett '90	Brinkman, Donald J. '85
	Zelazo, Ronald E. '86	Young, Robert D. '78	MI K	Zierau, Siegfried M. '61	Williams Jr., Robert C. '83	Larson, William J. '77
MA A	Brown, Linfield C. '64	Zwally, C. Lee '41	MNA	Zozzaro, John L. '64	Cole, David Michael '88	Staffner, Charles R. '74
	Buffinton, Keith W. '79	Spall, James C. '79		Zygo, John P. '70	Hill, David A. '77	Scharr, Brian F. '87
	Curtis, Jonathan G. '69	Thayer, Bruce P. '81	NJ A	Kline, Donald R. '55	Kammerlenn III, John T. '76	Billman, Randy W. '82
	Foster, Arthur R. '45	Walch, Matthew J. '86		Rafleyan, Kamran Lee '89	Waters, David G. '79	Kasner, James H. '87
	Harrison, Michael S. '74	Henry, Roger Charles '92	NMA	Bacastow, Jack L. '73	Wong, Richard L. '54	Kassay, Leonard E. '76
	Laughlin, William T. '64	Christensen, Thomas M. '79		Bradell, David J. '83	Calfo, Frank S. '81	Wielopolski, Richard J. '76
	Leis, Robert P. '73	Cottrill, Harry E. '51		Brantz, Omega S. '53	Veblunias, Rimas V. '74	Kraynson, Benjamin C. '05
	Milauskas, Ronald J. '62	Goodwin, Robert W. '62	NMB	Peace, Jeffrey H. '76	Hughes, Michael Kevin '97	Eckhardt, Andrew J. '79
	Osborn, Henry H. '50	Hodek, James A. '65		Smith, Jeffrey A. '84	Blair, John R. '77	Krueger, Karl H. '73
	Sakakeeny, Richard M. '70	Holzner, Donald N. '60		Andrews, Mark Jay '91	Caultle, P.E., Daryl L. '85	Rohr, Timothy P. '80
	Stark, Lucius D. '64	Loughlin, James P. '85	NMI	Gonzales, Michael A. '74	Vance Jr., Stuart '83	Bowers, Keith Allen '91
	Sullivan, Gerard F. '68	Patesch, Douglas J. '84		O'Donnell, William D. '53	Ma, Robert Ping-Chung '88	Kelly, Joseph Joseph '88
	White, Alfred L. '60	Severson, John A. '72	NY B	Seth, Charles E. '84	Mauney, C. Herman '53	Kovacs II, William '74
MA E	Bittner, Douglas E. '83	Sueker, P.E., Keith H. '47		Turner, Diane R. '78	Morton, Rodney E. '84	Adams Jr., Lee A. '49
	Brunetto, Thomas P. '74	Sunderman, Richard P. '61		Zich, Jonathan H. '80	Phoenix, John S. '77	Blakeburn II, D. Lowry '83
	Calvo, Alberto B. '70	Thompson, Richard A. '77	NMI	Rocco, Jim R. '85	Searle, John R. '70	Buckingham, Alfred C. '58
	Engler, Harold F. '75	Van Essen, John S. '74		Kofman, Boris '86	Smyler, Theresa Mooney '85	Carnes Jr., Albert C. '56
	Esposito, Ronald J. '74	Ziener, Roger E. '61	NY A	Kundakici, Vace '73	Beeson Jr., Donald R. '42	Gibbs, Richard R. '53
	Hayden, Thomas L. '62	Black, Howard Wayne '95		Lee, Harry C. '72	Hovis, John Garrison '78	Hernzack, Ralph A. '44
	Herzberg, Ernie '51	Boozler, Drayton D. '66	NY B	Richmond, James A. '72	Jackson, James R. '69	Johnson, James '59
	La Lone, James C. '70	Dodd, Jimmy L. '58		Ballaro, Charles A. '87	McConnell III, Ezra L. '83	Miller, Mark S. '74
	Linscott, Anne Wickard '80	Hibbard, Janet C. '86		Baxter, Douglas H. '83	Olive, Billy B. '48	Shuck Jr., Robert L. '66
	Marks, Robert A. '54	Hibbard, Michael J. '78		Bickley, Thomas D. '78	Prevatt III, Richard M. '77	Yondersmith Jr., William M. '68
	Pinkham IV, Thomas A. '88	McKay Jr., Frank F. '60		Kelley, David B. '61	Rogers, Charles J. '84	Blais, Roger N. '66
	Power, George H. '57	McKee Jr., C. Chester '44		Lowland, John R. '59	Vadnais, Paul A. '73	Bobo, James E. '77
MA Z	Brindley, Samuel B. '80	Nelms, Larry T. '63		Phillips, Glen E. '71	Daemer, Gary G. '92	Collins, Michael Dean '92
	Kelly, Thomas W. '80	Owens, John K. '65		Poulsen, Neils R. '57	Dockery, William H. '79	Elliott III, William E. '83
	Lastella, Michael J. '72	Seitz, T. Bing '63		Smolovitz, Matthew M. '80	Hinkle, Mark Ois '96	Perrault Jr., John E. '75
	Scott, George L. '63	Shackouss, Bobby S. '72	NY F	Wedlake, Raymond A. '73	Jones, Lucille '86	Schmude, Douglas '86
MA H	Strzegowski Jr., Joseph C. '67	Slier, Raymond D. '83		Bergenthal, Jon F. '75	Langolotti, P.E., Carolyn B. '86	Sherrill, Shirley W. '82
	Dada, James A. '84	Sims, Joseph H. '63		Bond, Paul W. '72	Patel, Hemantkumar N. '84	Sossamon, Dana R. '76
	Manevich, Daniel C. '82	Stephens, Jack D. '83		Chamberlin, Donald M. '67	Allen, James A. '88	Waldorf, John W. '83
	Penafiel, M.D., Jay Buhay '90	De Young, Lance G. '65	MO A	Clarke, William H. '66	Green, Regina W. '79	Morgan, Travis Orin '48
MI A	Bachman, Charles W. '48	Hea, James P. '68		De Groot III, Ward W. '54	Herbold, Frederick J. '69	Andresen, Kenneth W. '53
	Chamberlain, P.E., Adrian Ray '51	Meyer, Roland P. '78		Dobson, John P. '82	Jacobsen, John W. '69	Arsenault, P.E., Paula M. '81
	Chiti, James D. '71	Sandfort, Robert M. '64		Dunnells, Robert E. '53	Biery, Charles A. '83	Bishop, Donald R. '85
	Gardner, John A. '77	Stepanek, Curtis E. '79		Endriss, Kevin J. '78	Cazier, John M. '52	Bollen, Walter M. '47
	Kannawin, Willis F. '54	Weary, Franklin G. '70		Farber, Mitchell S. '84	Faber, Tracy L. '80	Brooks, James S. '51
	Kuzma, Dennis C. '58	Woolsey, John R. '70	MO B	Geschwindner Jr., P.E., Louis F. '67	Ferenz, Robert M. '80	Buxton, Charles E. '62
	Morrison, Donald M. '60	Regenstreif, Joyce '78		Green, Regina W. '79	Goralski, Christian T. '64	Cockeram, Donald J. '49
	Mueller, James M. '70	Sandford, Thomas A. '59		Herbold, Frederick J. '69	Gschwind, Leon D. '55	Davis, Donald A. '51
	Regenstreif, Joyce '78	Shannon, David H. '59		Jacobsen, John W. '69	Heyman, Duane A. '63	Jones, Reilly C. '73
	Shannon, David H. '59	Spray, P.E., Kenneth E. '51		Biery, Charles A. '83	Holcomb, J. Eric '82	Leonard, James P. '67
	Spray, P.E., Kenneth E. '51	Stroutman, Carl L. '43		Cazier, John M. '52	Karkalik, Fred G. '59	Miller, George E. '77
	Woelzlein, Wilmar M. '51	Woezlein, Walter T. '43		Faber, Tracy L. '80	Ockunzki, Kelly A. '94	Milton, Stuart W. '84
MI B	Anderson, Walter T. '43	Bohrer, Timothy H. '71		Ferenz, Robert M. '80	Oran, William A. '63	Newbern, David W. '65
	Korpi, Mary B. '86	Henrikson, Leslie L. '58		Goralski, Christian T. '64	Shape, Frederick M. '54	Nichols, Richard S. '49
	Ojala, William K. '54	Korpi, Mary B. '86		Gschwind, Leon D. '55	Stewart Jr., Paul V. L. '50	Runter III, W. Burton '74
	Scott, Kenneth J. '55	Ojala, William K. '54		Heyman, Duane A. '63	Stock, Daniel L. '80	Sias, James F. '57
	Stehulak, Edward S. '86	Scott, Kenneth J. '55		Holcomb, J. Eric '82	Tanaka, Gordon Y. '76	Sigworth Jr., Harrison W. '68
	Vojtech, Larry J. '69	Stehulak, Edward S. '86		Karkalik, Fred G. '59	Tozer, Richard F. '61	Smith, Mark C. '89
	Wacker, Don H. '52	Vojtech, Larry J. '69		Ockunzki, Kelly A. '94	Whittington, John T. '33	Thresher, P.E., Robert W. '62
	Wilden, P.E., Hans J. '54	Wackner, Don H. '52		Shane, Frederick M. '54	Woodell, Harry E. '81	Brownlie, Thomas J. '71
	Winn, Oliver H. '42	Wilden, P.E., Hans J. '54		Stewart Jr., Paul V. L. '50	Ward, William L. '85	Diemer, R. Bertram '73
	Witte, Richard C. '57	Winn, Oliver H. '42	MO G	Stock, Daniel L. '80	Burger III, George D. '68	Edwards, Gilbert S. '67
MI G	Baxter, John E. '57	Witte, Richard C. '57		Patel, Hemantkumar N. '84	Buynacek, Edward J. '57	Erickson, Richard K. '85
	Beatty III, Howard W. '76	Witte, Richard C. '57		Allen, James A. '88	Dutko, Robert James '90	Hughes, Michael R. '87
	Cameron, John J. '66	Witte, Richard C. '57		Green, Regina W. '79	Ehrnschwender, Arthur R. '48	Kankelborg, Carol C. '86
	Campbell, John A. '62	Witte, Richard C. '57	NY A	Herbold, Frederick J. '69	Hagedorn, Donald E. '54	Knox, Robert S. '53
	Colby, Gary C. '82	Witte, Richard C. '57		Jacobsen, John W. '69	Armer, Brian L. '85	Krooth, William E. '72
	Connable, Tenho S. '42	Witte, Richard C. '57		Biery, Charles A. '83	Hettrick, Robert N. '53	Lasser, Howard G. '50
	Crouch, Dennis E. '62	Witte, Richard C. '57		Cazier, John M. '52	Leonard, Ralph A. '59	Lentz, Robert R. '65
	Davey, Peter E. '50	Witte, Richard C. '57		Faber, Tracy L. '80	Schalch, Edwin A. '56	Lybca, John H. '73
	Davies, John R. '50	Witte, Richard C. '57		Ferenz, Robert M. '80	Pollock, Flavil M. '77	Lybca, John H. '73
	Engelhardt, Larry N. '77	Witte, Richard C. '57		Goralski, Christian T. '64	Ruebusch, Robert J. '70	Lynch, Sarah Hayward '89
	Finnegan, Patrick M. '57	Witte, Richard C. '57		Gschwind, Leon D. '55	Stergiopoulos, James M. '61	O'Hara, John J. '73
	Fox, Michael J. '81	Witte, Richard C. '57		Heyman, Duane A. '63	Totten, James F. '56	Possman, Alan W. '67
	Frederick, Frank T. '71	Witte, Richard C. '57		Holcomb, J. Eric '82	Yost, David B. '87	Talhelm, Donald L. '59
	Garrett, Clarence R. '49	Witte, Richard C. '57	NY E	Karkalik, Fred G. '59	Balthaser, James L. '71	Tavianni, David '82
	Ginn, Robert M. '48	Witte, Richard C. '57		Ockunzki, Kelly A. '94	Bouman, Robert W. '60	Anderson, Charles A. '57
	Greene, Edward B. '51	Witte, Richard C. '57		Oran, William A. '63	Clum, James A. '60	Andrichak, Stephen M. '58
	Griffin, William R. '77	Witte, Richard C. '57		Shane, Frederick M. '54	Cowan II, Robert L. '66	Beecher, Gregory A. '78
	Gronzer, John D. '72	Witte, Richard C. '57		Stewart Jr., Paul V. L. '50	Dague, Michael F. '64	Crota, Marcie D. '95
	Possman, Michael A. '88	Witte, Richard C. '57		Stock, Daniel L. '80		
	Hall, Henry C. '50	Witte, Richard C. '57		Tanaka, Gordon Y. '76		
	Holmes, John W. '65	Witte, Richard C. '57		Tozer, Richard F. '61		
	Johnson, Kalin S. '46	Witte, Richard C. '57		Whittington, John T. '33		
	Karl, Donald E. '71					

CHI CLUB, CONTINUED

	Dietz, Mark S. '80	Shafer, Robert W. '47	Marcus, Larry A. '72	Garito, Ira W. '68	Latiolait, Phillip G. '61
	Dreibelbies, George A. '55	Tomlinson, Edward T. '72	Savage Jr., Thomas J. '61	Leach, David R. '76	Lee, Neil Y. '76
	Gasda, David C. '70	Totten, Barry N. '82	Shearer, Richard L. '70	Sirkis, Murray D. '51	Middleton, Ralph E. '81
	Grimm, James E. '73	Vandenbulck, Charles F. '56	Tolson, Robert H. '59	Whitlow, Jeffrey D. '83	Niemeth, Ricky E. '86
	Huber, Ronald K. '70	Ward, Joanne S. '81	VA I Abbott, Terence S. '75	Wong, Jack O. '81	Oei, Paul C. '87
	Hummel, John R. '73	Whitten, James R. '59	VA A Labelle Jr., William M. '89	AZ I Dickson, Eric K. '81	Schmeringer, Paul '65
	Klingensmith, Ricky L. '82	TN B Bass, Jay K. '87	VA A Browder Jr., James G. '66	Heaton, Janet Day '84	Tam, Clement '73
	Kolivosky Jr., John E. '92	Burnett Jr., Wilton W. '67	WAA Confer, Peggy J. '81	Brown, William D. '69	CA H Humphreys, Evan '75
	Krolick, Ronald D. '83	Hall, John R. '55	Hulsizer, Stephen A. '69	Gunderman, Stacy L. '88	Lawrence, Oscar W. '75
	Kutz, Scott A. '54	Hampton, David R. '85	Kerkam, Kevin Franklin '90	Hunt, Gary W. '82	CA K Ramirez, Marvin J. '82
	Longenecker, John R. '71	Hodges Jr., Willie E. '67	Kinell, David L. '82	Jones, Michael D. '67	Taylor, Robert D. '82
	Marsteller, Charles E. '74	Morrison, William H. '70	MacDougall, Donald G. '61	Kooker, Stephen L. '63	CA A Treinen, Donald J. '83
	Moore, Albert L. '56	Pentecost, Eugene E. '50	Matteson, James H. '66	Lyon, Thomas A. '50	Fong, Rodney S. '82
	Pfeiffer, Sigmund B. '52	Skoglund, Paul A. '89	Matthaei, George L. '48	Perciful, Jerry C. '60	CA A Johnson, Lowell H. '65
	Reese, J. Mark '80	Sloan, Barbara F. '74	O'Druid, Bruce G. '91	Peters, Brett A. '87	Lieu, Tom '94
	Skoglund, John W. '51	TN I Ingraham, Edward R. '68	O'Byrne Jr., Michael E. '61	Reed, John L. '68	Olkipis, Alexander E. '91
	Smith, Edward I. '64	Perkins, William S. '54	Osg. Daniel G. '66	Sharp, Steven H. '76	Oizzardo, John Joseph '91
	Solar, Ronald J. '72	TN A Knight, Joseph Brent '93	Ottaman, Lloyd G. '54	Smith, Byron D. '85	Schmitz, James A. '83
	Stern, George R. '62	Miles, Thomas O. '81	Reichel, Jere D. '66	Stice, James E. '49	CA A Smith, Robert P. '75
	Walsh, John A. '52	TN E Smith, P.E., C. Craig '80	Volkirch, Terence J. '84	Tissi, Mark S. '82	Sturgeon, William R. '70
	Wilt, Kenneth D. '84	Stone, Robert H. '58	Walker, James R. '55	Zaleski, Michael E. '63	Verbrugge, John A. '77
PA I	Cavalier III, Forrest J. '89	TX A Adamo, Paul M. '85	Welsh, Bryan D. '87	Ziegler, Norval F. '52	Wells, Russell P. '77
	Cavalliere, Nina L. K. '89	Batla, August J. '66	Williams, Donald S. '66	CA A Baker, C. Vincent '62	Young, Jeffrey W. '69
	Coffin, Ralph S. '77	Bellows, Frank W. '47	WAB Ambros, William D. '51	Ball, John W. '52	CA M Aboumarzouq, Joseph D. '73
	Dvorsky, James E. '81	Bethell, William D. '45	Anderson, Warren L. '66	Cocotis, Paul Alexander '90	Beard, David Charles '91
	Fetzer Jr., John A. '56	Carroll, Billy D. '64	McClelland, Robert L. '59	Dietsche, Laura R. '81	Freeman, Karl Allen '89
	Harvey, Edward D. '39	Chambers, John D. '49	Moors, Donald E. '55*	Flerztzheim Jr., H. A. '53	Johnson, Bruce W. '78
	Licht, Robert B. '55	Dillard, Frank J. '72	Oakley, Fanning T. '53	Gilbert, Paul H. '59	Lee, Steven Y. '86
	McAleer, William K. '42	Finley, Mark H. '63	Ray, Edwirth L. '48	Gourdin, William H. '72	Yoshida, Todd '84
	McIvred III, Howard G. '53	Foley, Dennis G. '70	Schmidt, V. Hugo C. '91	Hassur, Karl R. '82	CA N Armstrong, Ronnie A. '84
	Robb, Frank J. '73	Herring, David M. '55	Spencer, Paul N. '52	Kaplan, William S. '50	Armstrong, Robert A. '81
	Shaffer, David B. '68	Hurst, Terry L. '76	Thomas, David W. '55	Lammers, Thomas R. '50	Beardsley, Robert F. '71
	Taylor, Robert N. '53	Kuennemann, Wesley B. '59	Damman, Lawrence M. '71	Magvary, Andrew '65	Bohnann, James G. '70
	Wisman, Craig B. '67	Lancaster, David C. '61	WVA Campbell, Donald F. '78	Mar, Wing Jong '79	Chen, Peter W. '76
PA A	Besarab, M.D., Anatole '65	Luke, Claude E. '52	Costanza, Russell V. '62	Panichelli, Paul A. '83	Fisher, Selene M. '85
	Eystein, Herbert '49	Porcher, Calvin E. '48	Engle, Geoffrey S. '94	Pister, Karl S. '94	Fujita, Jerry S. '81
	Heilmeier, George H. '58	Setliff, Sanford R. '69	LeMasters, Jerry R. '63	Pocha, Michael D. '68	CA N Howard, Robert S. '80
	Ware, Willis H. '41	Smith, Daniel R. '75	Martinez, Louis J. '75	Rae, James W. '52	Lohman, John S. '82
PA E	Albus, Donald R. '49	Smith, M.D., Matthew Thomas '92	Reynolds, Barry D. '84	Reynolds, Barry D. '84	Mayer, Robert J. '85
	Clark, Gordon B. '51	Stanley, William R. '94	Secor, Kenneth E. '55	Secor, Kenneth E. '55	Mektrakarn, Wichian '86
	Coffey, James M. '75	Tran, P.E., Tan Dai '87	Serr, Eugene F. '46	Serr, Eugene F. '46	Newberry, Conrad F. '57
	Krein, Philip T. '76	Turner, William D. '61	Silverstone, Michael S. '66	Panichelli, Paul A. '83	Shannon, James D. '62
	Kuhn, William L. '67	Wazcha, Ladislaus V. '48	Trzezek, George J. '61	Pister, Karl S. '94	Vandegge, Don G. '67
	Richards, Gerald T. '57	White, Karen T. '84	Webb, Douglass G. '49	Pocha, Michael D. '68	CA E Veit, Brian Richard '98
	Wetzal, P.E., Edward D. '74	TX B Bowden, Ronald R. '74	Woolf, I. David '61	Rae, James W. '52	Curry, Monica G. '92
	PA Z Aepfl, Theodore C. '62	Darby, Mark L. '79	Burke, James D. '45	Reynolds, Barry D. '84	Curry, Robert S. '94
	Buehler, Robert Hans '92	Ellisen, Arthur R. '62	Lall, Stephen J. '86	Secor, Kenneth E. '55	Doering, Brian J. '81
	Dieter Jr., George E. '50	Gilmer, Tracy F. '80	MacDougall, Donald D. '45	Serr, Eugene F. '46	Greco, Anna Maria E. '81
	Mergel, Joseph '64	Hilberg, John A. '84	Royden, Constance S. '80	Pister, Karl S. '94	Hart, Laura J. '82
	Pescavardi, Thomas '64	Killion, Larry D. '71	Savellano, Mark D. '93	Pister, Karl S. '94	Hawkins II, John C. '79
	Rakula, Dierk H. '55	Rossler, Steven W. '73	Young, Jeffrey L. '80	Pister, Karl S. '94	Nicoloff, Louise D. '82
	Struckman, Russell W. '64	Stinson, John M. '66	WI A Beutler, Arthur J. '48	Young, Jeffrey L. '80	Nicoloff Jr., Nicholas '83
	Walter, Donald K. '53	Uher, Edward L. '65	Breuer, Ned W. '52	Buehring, William A. '67	Patterson, Richard H. '74
PA H	Boldt, Charles M. '73	Altman, Thomas C. '70	Buehring, William A. '67	Cattol, Robert L. '50	Stewart, Diana F. '83
	Ellis Jr., Ira E. '62	Burns, Jack F. '49	Cattol, Robert L. '50	Crucker, Thomas W. '60	CA O Elliott, Dennis M. '82
	Hills, Frederick J. '61	Dobbins, James R. '74	Crucker, Thomas W. '60	Derusha, James R. '55	Kusters, John A. '64
	Hotchkiss, Jeffrey R. '69	Hagler, Marion O. '63	Derusha, James R. '55	Forner, Stacey L. '96	Maulhardt, Alan L. '81
	Keil, Alan J. '72	Herring, Robert B. '63	Johnson, Joseph W. '79	Gordon, Matthew H. '86	CA II Barchicchi, Emile N. '79
	Reiner, Robert E. '64	Jones Jr., Kenneth H. '58	Klanderman, Kent A. '58	Holsinger, Kevin K. '84	Gordon, Albert P. '84
	Thompson, Robert A. '60	Lodal, Jan M. '65	Knock, Calvin A. '45	Holton, David S. '53	Lockwood, P.E., Robert W. '49
PA Ø	Behen I, John L. '72	Maxfield, Robert R. '64	Larson, P.E., Nils I. '58	Mullen, Merritt J. '75	Mullen, Merritt J. '75
	Castellan, Susan M. '84	Money, Lloyd J. '42	Le, Jun Wei '68	Niemeth, Donald G. '77	Siersteh, Donald G. '77
	Diener, David E. '67	Pieper, Wylie E. '53	Schuh, Peter O. '63	Hoffmann, Kevin V. '80	CA P Hoffmann, Kevin V. '80
	Gallen, P.E., Robert M. '64	Turvey, Harry D. '73	Stickles, Kenneth '67	Mandrell, Nathan Keith '92	Mandrell, Nathan Keith '92
	Kneidinger, Carl F. '70	Wiprud, Robin Gail Gifford '85	Tellier, Ronald R. '73	Patteson, Douglas K. '92	Patteson, Douglas K. '92
	Lynch, Robert D. '53	TX A Ash Jr., Henry G. '59	Ver Hagen, Jan '61	Mendel, John T. '48	Swanson, Michael Lee '95
	Thayer, James L. '68	Burger, David C. '71	Wolf, James F. '59	Muscha, Leslie Catherine '95	CA S Radasky, William A. '81
	Reed, P.E., Theod. Eugene H. '69	Cloud, Eugene H. '87	Pau, Bobby K. '65	Elliott, Dennis M. '82	CA T Brennan, Phillip '89
	Meyerson, Joseph T. '67	Dement, James R. '74	Delgado, Jose M. '65	Frantz, Paul J. '78	Hoang, Khue Van '91
	Woods Jr., Howard J. '77	Embry, Dale L. '77	Deschida, Linda M. '82	Geary, Richard '56	Lee, Chin C. '70
PA K	Beseler, Jan W. '88	Glasscock, Melburn G. '59	Hayes, John J. '81	Gordon, Matthew H. '86	Lotocky, Daniel A. '84
PA A	Kondylin, Demetre E. '82	Goodson Jr., Alfred W. '70	Kam, Clifford Y. K. '51	Holsinger, Kevin K. '84	Shen, P.E., Eric Chi-Chun '93
	Reedy, Herman E. '75	Hughes, James M. '54	Kleinweld, Lynn A. '65	Holton, David S. '53	CA V Christian, Matthew P. '83
	Smerciak, Bryan J. '90	Langren, Dak L. '71	Langren, Dak L. '71	Kops, Robert W. '85	CA Ø Outman, Andrew '91
PR A	Garcia, Carlos E. '77	Murawski, Steven L. '73	Murawski, Steven L. '73	Kopelman, Ori M. '85	CA Ø Chi, Corinna Jane '83
	Irizarry, Arcelio '86	Mason Jr., P.E., John M. '81	Mason Jr., P.E., John M. '81	Mapel, William J. '43	CO A Bement Jr., Arden L. '54
	Ramirez, Miguel A. '73	Porter Jr., James W. '51	Porter Jr., James W. '51	McClendon, Scott '60	Cochran, Noelle R. '86
RI A	Fancher, H. Brainard '35	Simpson, Stacey A. '79	Simpson, Stacey A. '79	McDonald, John C. '59	Corkill, David W. '82
	Fradkin, Henry E. '68	Smith, Manning D. '64	Smith, Manning D. '64	Mendel, John T. '48	Crissi, Peter A. '86
	Kenney Jr., Joseph '50	Strait, William L. '49	Strait, William L. '49	Muscha, Leslie Catherine '95	Deluca, Frank A. '80
	Nielsen Jr., Carl E. '56	Thomas, Richard E. '51	Thomas, Richard E. '51	Elliott, Dennis M. '82	Haverath, Thomas W. '73
	Vascellaro, Jerome C. '74	Zimmerman, Keith D. '89	Zimmerman, Keith D. '89	Frantz, Paul J. '78	Kidway Jr., Arthur J. '56
	Vigar, Judith W. '83	TX E Hillegeist, Reynold B. '63	Hillegeist, Reynold B. '63	Geary, Richard '56	CA P McPherson, Steven D. '83
	Binns, George '59	Hon, Wai-Leung '67	Hon, Wai-Leung '67	Gordon, Matthew H. '86	McPherson, Steven D. '83
	Luz, James J. '80	Mitchell, John D. '68	Mitchell, John D. '68	McDonald, John C. '59	Austin, Stephen C. '74
	Toy Jr., Paul C. '70	Power, L. Douglas '66	Power, L. Douglas '66	Mendel, John T. '48	Brennard, John R. '67
SC A	Corpening, Joseph B. '72	Wuensch, Frederick R. '72	Wuensch, Frederick R. '72	Muscha, Leslie Catherine '95	Brooks Jr., Lowell W. '62
	Dalrymple, Gerald A. '83	TX Z Johlke, Roy A. '59	Johlke, Roy A. '59	Putt, Brian H. '72	Cole, Charles O. '67
	Davis, Joseph Howard '81	Lee, Stephen P. '83	Lee, Stephen P. '83	Riggs, Henry E. '58	CA P Cormack, Christopher W. '82
	Hunter, James R. '85	Manning Jr., Thomas A. '57	Manning Jr., Thomas A. '57	Root, Steven D. '75	England, James S. '41
	Rankin, Anne Marie '90	Tran, Bao Tan '84	Tran, Bao Tan '84	Sutherland, Kenneth H. '78	Ericksen II, Thurston G. '74
	Rast Jr., Heber E. '63	TX H Fairchild, Jack E. '53	Fairchild, Jack E. '53	Weaver, James A. '71	Farmer, Brian K. '78
	Speed, Penelope H. '87	Falk, Nathan M. '75	Falk, Nathan M. '75	Wichman, Eric A. '60	Franchino, Robert A. '60
	Ward, Robert M. '86	Hoffman, Heather Brunn '92	Hoffman, Heather Brunn '92	Brooks, James R. '72	Frey, Bryce A. '56
SC B	Allison, H. Bard '53	Nichols, Robert L. '47	Nichols, Robert L. '47	Delvin, Sandra A. '76	Furman, Michael L. '80
	Calvo Jr., Philip S. '48	Totten, Dwight L. '66	Totten, Dwight L. '66	Fetterolf-Klein, Shelley M. '82	Graham, Leroy C. '50
	Harris, Raymond E. '87	Worden, Ph.D., Sue Janine '78	Worden, Ph.D., Sue Janine '78	Frank, Harrison '50	Hanna, William J. '43
	Husband, D. Mark '83	TX Ø Alvarado, Ruben A. '72	Alvarado, Ruben A. '72	Fröhlich, Carl H. '74	Herhold, Mark K. '80
	Mann Jr., Willie F. '60	Havo, Karen P. '85	Havo, Karen P. '85	Hedrin, Richard A. '69	Horrell, Robin S. '85
	Massey, Kristina L. '71	Munch, Paul F. '69	Munch, Paul F. '69	Herzog, Donald E. '79	Lower, Gene R. '65
	McCasky, Harold O. '79	Putnam, Judd L. '73	Putnam, Judd L. '73	Horton, William D. '53	Joselyn, Jo Ann '65
	McCasky, Suzanne D. '80	Stokes, F. Xavier '78	Stokes, F. Xavier '78	Johnson, Wesley W. '66	Kayse, Kevin S. '78
	Moore, William Edwin '59	Daniels, Jerry D. '79	Daniels, Jerry D. '79	Katun, P.E., Robert A. '74	Lafollette, Jack '59
	Palmer, Thomas A. '50	TX K Alsop, Albert W. '80	Alsop, Albert W. '80	Kester, Larry A. '78	Lappens, John C. '76
	Shippy Jr., Keller P. '62	TX A Rosenwald Jr., John Andrew '88	Rosenwald Jr., John Andrew '88	Mallis, Richard '62	Massard, Robert L. '45
	Wilson Jr., Robert L. '64	Endo, Thomas M. '82	Endo, Thomas M. '82	Mallis, Richard '62	Moore, USAF Ret, William J. '57
SC I	Attanasio, Roger A. '57	Lamp, Jane Ann '80	Lamp, Jane Ann '80	Nakatsuki, David T. '63	Mueller, Anson G. '49
	Duffy, USAF Ret, Robert A. '51	Lyman, George R. '79	Lyman, George R. '79	Roof Sr., Dwight E. '57	Potochik, Frank S. '50
	Evans, Joseph M. '50	Malmquist, David A. '62	Malmquist, David A. '62	Shields, Linda '84	Salyards, Donald G. '52
	Gooley, Thomas J. '65	Ong Jr., John N. '52	Ong Jr., John N. '52	White, John G. '50	Solomon, David '49
	Macdonald, J. '62	Peterson, Charles C. '68	Peterson, Charles C. '68	Zaatar, Mohammed Omar '88	Talcutt Jr., Noel A. '73
	Reed III, Henry M. '60	Reimertsen, John G. '71	Reimertsen, John G. '71	Anton, Philip Jr. '63	Watry, Michael J. '89
	Reed III, Henry M. '85	Friedman, Steven Michael '91	Friedman, Steven Michael '91	Brooks, James R. '72	Wrightman, Michael Paul '90
	Rogers, Cranston R. '49	VT A Sheldon-Dean, James P. '79	Sheldon-Dean, James P. '79	Delvin, Sandra A. '76	CA A Bement Jr., Arden L. '54
	Seckinger, P.E., Allen H. '50	VT B Cobb, Eben C. '77	Cobb, Eben C. '77	Fetterolf-Klein, Shelley M. '82	CO A Thompson, Gregory O. '01
SD A	Case, Robert H. '76	Salazar, Marcos E. '82	Salazar, Marcos E. '82	Frank, Harrison '50	CA Ø Baulzith, John E. '60
	James, Karen K. '85	Urcuioli, Joseph C. '88	Urcuioli, Joseph C. '88	Fröhlich, Carl H. '74	Bennett, Beth A. '91
SD B	Stoebner, Richard A. '78	Anderson, Robert S. '80	Anderson, Robert S. '80	Hedrin, Richard A. '69	Eastman III, Frank H. '63
TN A	Ayers, William R. '80	Conway Jr., George F. '70	Conway Jr., George F. '70	Herzog, Donald E. '79	Johnson, Edwin W. '57
	Baker, Jon P. '74	Donoho, Thomas E. '59	Donoho, Thomas E. '59	Horton, William D. '53	King, C. Judson '56
	Barnhart, Philip W. '48	Fair, Robert R. '50	Fair, Robert R. '50	Johnson, Wesley W. '66	Kucera, Daniel J. '61
	Bounds, John A. '80	Harpel, Barbara M. '96	Harpel, Barbara M. '96	Katun, P.E., Robert A. '74	Lehman, Jill Fain '81
	Cook Jr., Joseph C. '65	Harris, Wesley L. '64	Harris, Wesley L. '64	Mendel, John T. '48	Merritt, Richard G. '50
	Gonzalez, Rafael F. '65	Hayes Jr., John R. '75	Hayes Jr., John R. '75	Muscha, Leslie Catherine '95	Assard, Gerald L. '59
	Hueser, David L. '76	Iachetta, F. Anthony '50	Iachetta, F. Anthony '50	Putt, Brian H. '72	Binks, Victor J. '56
	Jarratt, James S. '68	Johnson, W. Reed '53	Johnson, W. Reed '53	Riggs, Henry E. '58	Brenna, Patricia M. '81
	Kaminsky, Lawrence V. '81	Morgan III, Edward '48	Morgan III, Edward '48	Root, Steven D. '75	Dembieczak, Gerald J. '74
	Kennedy, Michael E. '86	Wadsworth, Robert M. '82	Wadsworth, Robert M. '82	Sutherland, Kenneth H. '78	Devin, Maurice R. '73
	Layman, Ronald T. '77	TX B Anderson, Mark E. '76	Anderson, Mark E. '76	Weaver, James A. '71	Fappiano, Michael D. '87
	McCurdy, Harold C. '43	Bucklen, Okley B. '59	Bucklen, Okley B. '59	Wichman, Eric A. '60	Hawkins, John E. '38
	Moore, Robert M. '47	Drilling Jr., Raymond B. '64	Drilling Jr., Raymond B. '64	Wichman, Eric A. '60	Hill, David E. '83
	Moore, Terry M. '67	Fetter, Robert B. '47	Fetter, Robert B. '47	Wichman, Eric A. '60	Holland, Donald S. '72
	Mynatt Jr., Roy L. '58	Hanley, Thomas R. '67	Hanley, Thomas R. '67	Wichman, Eric A. '60	Layman, Timothy P. '79
	Peach, Judith E. '77	Hydruke, Robert A. '74	Hydruke, Robert A. '74	Wichman, Eric A. '60	Leib, David B. '61
	Prados, P.E., John W. '54	Hydruke, Robert A. '74	Hydruke, Robert A. '74	Wichman, Eric A. '60	MAstracchio, Robert '64
	Prescott, Wallace S. '47	Lovell, Lale Gobukad '96	Lovell, Lale Gobukad '96	Wichman, Eric A. '60	Pennella, John J. '67
	Sanson, William B. '64*	Lovell, Matthew Bruce '96	Lovell, Matthew Bruce '96	Wichman, Eric A. '60	Politt, Julie Anne '87
		Mann, Richard J. '75	Mann, Richard J. '75	Wichman, Eric A. '60	

SECOND CENTURY CLUB

AL A	Brackin, Robert J. '80	Cammack, Norphlet G. '49
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SECOND CENTURY CLUB, CONTINUED

	Schmitz, Elizabeth M. '73	Schilson, Robert E. '50	Rinker, Robert G. '51	Woertz, Byron B. '33	Hsu, Katherine H. L. '82
	Sobel III, Anthony J. '70	Schleicher, Kathy L. '85	Rosenberger, Donald G. '78	Yantz, Robert C. '52	James, Peter A. '67
	Whitlsey, Richard A. '64	Smith, Leslie G. '48	Schipper, Michael J. '82	Yee, Ngai S. '82	Koehler Jr., Richard F. '67
CT I	Boccia, Michael '97	Soman, Harold G. '48	Stani, George W. '63	Brack, William T. '71	Krolikowski, Walter '81
	Judd, Kyle Peter '91	Spitzer, Robert E. '61	IN I	Brack, Raymond J. '63	Crucio, Gilbert K. '44
DE A	Andrews, Bruce S. '74	Sylwestrak, Daniel J. '83		Drnevich, Raymond F. '70	Marshall III, Harry A. '65
	Buehler, John H. '68	Tracy, Mark A. '86		Drnevich, Ronald J. '63	Marx, Austin F. '49
	Cercy, Michael J. '81	Uzarski, Ph.D., P.E., Donald R. '80		Flynn, Michael Joseph '89	Maskey, Robert H. '63
	Clements, Thomas C. '75	Wilkins, Ph.D., Gregory M. '92		Galezewski, Thomas M. '78	Miller, Paul G. '49
	Hahn, Charles B. '65	Zartman, Charles R. '59		Henry, Eugene W. '54	Nico, Anthony Rocco '96
	Keyser, Kevin Justin '88	Bonin, John H. '47	IL B	Nuckett, Dirk B. '79	Osborne, Robert C. '63
	Packard, Lawrence B. '88	Filetti, Edmund G. '54		O'Connor, Brian T. '72	Palitz, Bernard G. '47
	Smith Jr., Lewis S. '85	Hartwell, Robert A. '81		O'Connor Jr., Thomas E. '64	Piness Jr., George '49
DC B	Burns, Richard S. '59	Johnson, J. Randall '63		Pottmyer, James J. '62	Sifka, Richard B. '61
	Roberts, Carol A. '63	Lord, Mark C. '87		Schanning, Brian P. '68	Spradlin, Louis W. '57
	Roberts, John P. '62	Lorentz, Peter Michael '89		Simons, Joseph L. '75	Topolice, Claudio '76
	Wellen, Anita H. '80	McBlaine, Michael R. '75		Waugh, Richard C. '73	van Raate, John A. '59
DC I	Adams, Ann H. '83	McKerlie, Clyde J. '59	IN A	Eisenbart, Thomas R. '78	Rickman, Philip M. '83
	Decina Jr., Basil A. '85	Schlueter, Richard P. '83		Rouquette, P.E., Robert E. '74	Slovenko, S. Roy '48
	Grassel, Herbert H. '77	Sodoma, Mark T. '82		Slovenko, S. Roy '48	MAA
	Potterton, Richard L. '60	Thomas, Mark T. '82		Ilten, Kevin O. '72	Bloch, Frederick H. '68
	Stonsey, Ornuv '74	Underys, Algirdas A. '78		Lang, Robert P. '63	Green, Samuel H. '51
FL A	Baumert, Michael '84	Rickes Jr., Robert W. '63	IL I	McAlear, Hugh M. '64	Gunn, John F. '64
	Bowles Jr., Carl H. '54	Christopher, James M. '84		Moll, Harold E. '59	Hildebrandt, Eric Michael '92
	Brauns, Fred '58	Ferraro, Anthony S. '59		Olson, Stephen R. '87	Poppelo, Richard E. '58
	Dao, P.E., Solange C. '95	Greenberg, Daniel R. '80	IN E	Steffen, John R. '66	Russell, John H. '54
	Earle, P.E., Jonathan F. K. '65	Haase, John A. '53		Elder, James S. '80	Simon, Henry J. '60
	Edmunds, Robert C. '68	Miner, Warren P. '59		Finley, Ph.D., P.E., David R. '94	Smeglin, Anthony M. '76
	Frazier, Lori M. '77	Pincaut, Wayne '79		Lagrow, Timothy G. '83	White, Edward A. '47
	Giolma, J. Paul '69	Schwartzbard, David Leigh '91	IL A	Barbar, Thomas Lee '54	MAE
	Godwin, Owen L. '61	Smith, Howard W. '65		Blaylock, Martin E. '61	Chail, Michael '74
	Gordon, Horace C. '64	Weertman, Julia R. '46	IN A	Chapman, Jesse D. '52	Concannon, Robert J. '70
	Gunson, William E. '50	Wilsak, Richard A. '78		Offman, Vance D. '67	Ernst, Francis A. '68
	Johnson, Hjalma E. '58	Witt, Frank A. '55		Cortugno, John D. '77	Feldner, Wayne D. '70
	Kent, Richard B. '54	Zimmerman, Jerold R. '76	IL A	Cosgrove, John D. '56	Hankey, James J. '69
	Leavengood Sr., William H. '47	Toon, James B. '87		Mims, Jason Charles '95	Harris, Kent E. '71
	Lewis, Virgil Conley '91	Zapinski, Susan M. '83	IL E	Blackstone, Bradford Earl '91	Jonah, Maxwell V. '53
	Lorberbaum, Henri S. '77	Cassens, Mark W. '80		Blackstone, Jill E. '92	Katsoulas, Peter C. '70
	Lovell, Gilbert H. '82	Chen, Juh W. '53		Bush, Fred J. '76	Kenyon Jr., H. Payson '51
	Mennes, C. Martin '68	Garfield, William M. '83	IN A	Carsley, Denise Loring '92	Levesque, George E. '70
	Noden, David K. '83	Sheehan, Patrick J. '85		Connor, Edward J. '53	Madden, Val F. '78
	Perrygo, Charles M. '75	Wasylczak, Michael J. '78		Hendersson, Wallace D. '58	McCabe, James F. '70
	Ruth, Byron E. '55	Zimmermann, Thomas G. '78		Johnson, Philip M. '55	Riccio, Michael J. '89
	Saarinens Jr., Arthur W. '50	Bass, Steven C. '65		Laskey, Henry L. '51	Ridlon, Stephen A. '66
	Schnitzler, Bruce G. '69	Becker, Kenneth A. '81		McKenney, Peter C. '71	Sarafinas, Aaron '82
	Spenninger, William R. '55	Bein, Thomas W. '80		Ogden, Stephen W. '79	Tuck, John S. '57
	Townsend, Frank C. '62	Bertsch, Patricia B. '76		Ouellette, Alfred D. '76	Williams, Charles R. '53
	Vande Vusse Jr., Bruce A. '88	Bicknell, Bruce A. '88		Richter, Robert A. '50	MAZ
	Vande Walle, Robert J. '72	Bixler, Donald '49		Tomko, William A. '78	Bellevue, Robert J. '69
	Woodward, Michael B. '85	Blakeslee, Donald J. '51		Welch, Peter J. '72	Benwood, Bruce R. '69
FL B	Alvarez, Vicente '64	Boelter, Frederick W. '73	MDA	Welch, Robert M. '61	Burstein, Ph.D., Michael C. '64
	Capeletti, Tami L. '68	Brehob, Wayne M. '58		Armstrong, John E. '56	Crain, Melvin C. '50
	Stipes, Alesia J. '84	Brinson, Robert J. '60		Capecci, Dennis W. '79	Flynn, John C. '59
FL I	Anderson, Harry F. '75	Carson, William D. '90		Chesley Jr., John W. '38	Grayson, Robert W. '60
	Anderson II, Shannon R. '75	Carter, Eric L. '72		Cummings, Lori Malloy '83	Hellyar, Kenneth G. '69
	Brookins, Thomas M. '81	Cheesman, Mark W. '81		Davies, Daniel '73	Kaplan, Allan H. '74
	Chenkin, Joseph A. '82	Clofelter, Donald G. '55		DiGiorgio, Joseph B. '54	Koch, Robert F. '79
	Copeland Jr., Charles E. '73	Corns, Joseph B. '52		Eisgruber, Carl H. '77	Mathews, Archie '53
	Giovannelli, Ronald F. '76	Cross, Perry G. '74		Schroder, Eldon L. '46	Moles, Peter A. R. '83
	Houms, Nicholas J. '74	Davis, Duane M. '55		Shell, Andrew L. '71	Rainville, Robert F. '68
	Luce, John W. '50	Delleur, Jacques W. '49		Gore, Willis C. '48	Richie, William E. '57
	Pennington III, John W. '71	Dennis, Jack W. '59		Kerber Jr., Wilmer '48	Stampf, Christian R. '82
	Preslar, Daniel Alton '91	Dillon Jr., Robert E. '77	IA B	Kutcher Jr., John F. '86	Sullivan, Stephen J. '59
	Stagner, Ralph S. '82	Easto, William D. '79		Lu, Stanley '95	MAO
FL A	Boucher, Darnell M. '90	Edwards, Deborah J. '85		May, Davis S. '60	Gregg, John E. '84
	Hawfield, Troy Stanley '97	Eykam, G. Richard '56		Monmonier, Mark '64	Stoczylas, Geryaln C. '82
	Woods, David William '87	Frazer, William B. '47		Pedraita, James L. '78	MAI
FL Z	Hettell, Thomas A. '87	Frazier, George E. '57		Roycroft, Scott '65	Reimer, James J. '69
FL H	Baran, Thomas Vincent '93	Golan, James R. '54		Salemi, Robert M. '49	Berk, Kevin J. '84
	Karins, David Geoffrey '93	Graver, Richard B. '54		Sinsky, Allen I. '55	Brewer, Frederick E. '57
GA A	Bryant, Robert P. '58	Groninger, Richard D. '51		Thompson, Stephen J. '74	D'Agostino, Jack V. '51
	Burgess, John M. '61	Hall, James D. '67		Winter, George W. '48	Fox, Robert D. '57
	Chalain, Leonard J. '54	Hall, Thomas W. '87		Zehner, James W. '80	Kietzman, William C. '65
	Conger, Robert D. '82	Hambrook, Harold E. '55	MDB	Andersson, Gerard C. '57	Santoro, Thomas V. '66
	Crawford, David W. '61	Harper Jr., Clarence M. '48		Bartholomot, Henri D. '77	Shaffer, Jamie '87
	Damon, Henry E. '49	Harter, Larry L. '65		Bent, Dale P. '84	Watanabe, Gerald T. '72
	Dixon, Daniel B. '63	Harvey, Joyce A. '81		Brownstein, Barry J. '68	MI B
	Drawdy, Jean Elizabeth '78	Heiman, Donald N. '62		Deschere, David S. '82	Dejongo, Michael K. '65
	Ham, Ph.D., P.E., John Michael '80	Hildebrandt, James E. '52		Dinkel, Ralph E. '65	Edquist, Carl F. '77
	Hirth, Roy M. '61	Hockema, Richard W. '68		Eberly, Steven '87	Fayas, Duane G. '88
	Kuniansky, Eve Louise '81	Hodgin, David M. '47		Fthenakis, Emanuel John '51	Hannar, Richard H. '65
	LeCroy Jr., Edwin P. '67	Howard, Donivan R. '58	KS A	Galloway Jr., John P. '73	Hutula, David N. '66
	McConchie, Hayne '52	Karrenberg, Hans K. '54		Gaske, Thomas P. '76	Krause, Lawrence C. '86
	Negro, James E. '68	King, Daniel Arden '95		Halvorsen, Fred H. '64	Lind, Earl R. '50
	Northington, Peyton A. '78	King, Robert E. '44		Himes, Douglas L. '82	Lombard, Henry J. '51
	Parker, Jonathan E. '59	Lambert, Ralph E. '60		Isacangelo, Gerard F. '80	Mansfield, Michael G. '76
	Penn, Carlton D. '62	Livingston, Julian R. '68		Jochum, Thomas A. '75	Masica, Richard L. '58
	Phillips, Edward K. '74	Lodal, Peter N. '76		Johnson, H. Joseph '81	Mattson, James A. '70
	Schueler, William F. '72	Longley Jr., Richard M. '53		Marks, Richard W. '70	Newman, Frederick A. '83
	Smith, Michael M. '79	Lyon, Richard C. '56		McCracken, Richard P. '70	Ohlroge, Kevin C. '83
	Stowell, Robert L. '60	MacDonald, John M. '45		Mentzer Jr., William R. '61	Pearson, Walter C. '62
	Taylor, Harvey E. '65	Maloney, Eugene D. '64		Miller, Edward A. '50	MI I
	Thomas, J. E. Dorn '58	Masteller, Bill L. '57		Poulter, Harry D. '88	Boesiger, Edward A. '82
	Trawick, Charles D. '78	Nitschke, Norman E. '46		Williams Jr., Paul L. '53	Baehre, Eric E. '82
	Uehling, Jeffrey S. '79	Novy, Ph.D., Robert A. '85		Wolfe, Deborah L. '77	Barnes, Raymond H. '40
	Ware Jr., Clyde L. '59	Peiguss, James A. '79		Young, Patricia C. '88	Barr, William R. '70
	Watts, David L. '73	Pickett, Leroy K. '68		Zalesch, Steven E. '73	Bigelow, Wilbur C. '44
	Wetenhall, Paul D. '79	Rentz, Peter E. '55	KS B	Zelenietz, Jacob '44	Blair, David J. '57
	Winn, Charles E. '47	Rich, Warren E. '53		Quint, John H. '84	Boesiger, Edward A. '82
	Zimmerman, Clarence D. '65	Richter, Arthur '51		Sarina Jr., John J. '86	Brown, John M. '67
ID A	Cleveland, Gregory P. '87	Ringo, Kent A. '48		MDA	Burk, Joseph S. '52
	Erickson, Leif '80	Risa, Kristen '69	MAA	Alley, Christopher P. '85	Burkholder, Earl F. '73
IL A	Anderson, Donald D. '80	Roby, Dennis E. '60		Chace, Brian D. '69	Burton, P.E., James R. '48
	Beckett, Royce E. '44	Roth, Lisa A. '87		Hamel, Peter J. '81	Burton, Theodore R. '79
	Benjamin, Robert A. '50	Rust, Robert A. '52		Darling, Glenn R. '74	Butler, Harry '54
	Benzing, Leonora Ann '86	Satterly, Paul B. '82		Kullas Jr., Albert J. '38	Davis, Robert A. '81
	Brown, Harold T. '68	Schult, Thomas H. '64		Lancey, Roderic C. '51	De Boo, Robert J. '72
	Chittenden, William A. '52	Schwesow, Ronald L. '62		Lescoe, James Terrence '05	Delgass, William N. '64
	Clark, Elliot A. '83	Sheets, Dennis N. '67		Mitschang, George W. '65	Drago, Gary A. '75
	Cunningham, Lawrence K. '76	Sheets, Paul W. '82		Saltus, George E. '53	Ellis, Gene E. '50
	Davis, Stephen B. '85	Smigajski, Thomas S. '85		St Louis, Roland R. '52	Erickson, Robert P. '50
	Davison, Brian C. '87	Sommer, Dianna M. '83		Steinkamp, Donald H. '81	Evans, William A. '60
	Ditman, Jason Blair '91	Sosny, Richard G. '66		Wielk, Michael C. '86	Forster, John D. '66
	Else III, Daniel H. '73	Stilger, Donald L. '81		MA B	Gaberson, Howard A. '55
	Fisher, Robert L. '80	Stokes, Ronald B. '60		Aldrich Jr., Harl P. '47	Goodell, Charles E. '43
	Fosnaugh, Robert A. '54	Swanson, Dwight H. '48		Argani, Cynthia Holcroft '92	Gray, Jeffrey J. '94
	Fraser Jr., Edward S. '39	Trio, Mark C. '73		Bishop, Peter B. '70	Hansen, Peter E. '61
	Grant, Richard L. '60	Tucker, James A. '66		Braisted, Paul E. '79	Hansen, John G. '72
	Hehenstreit, Richard H. '45	Tvetter, Steven E. '74		Brooks, Donald H. '89	Hickcox, Timothy E. '65
	Jackson, Victor G. '49	Verville, Robert J. '67		Burtus, Lawrence M. '45	Hoisington, Robert H. '38
	Jonas, Steven G. '66	Warren, Scot W. '83		Cann, Roldal '51	Hole, William E. '51
	Kasper, Frank S. '52	Weaver, S. David '59		Charpie, David W. '82	Humes, Richard A. '76
	Kent, Michael E. '64	White, P.E., Stanley A. '57		Clardy, David T. '74	Hier, Gerald W. '49
	Kuske Jr., John A. '71	Wolff, Jay R. '48		Ditmyer, Steven R. '63	Insprucker III, John L. '78
	Laible, James R. '54	Wormser, Hans H. '44		Dodson, John O. '38	Klemm, Paul '54
	Lane, Brad G. '84	Wright Jr., Omar B. '49		Ellison, William T. '46	Laity, Thomas H. '45
	Le Blond, Peter C. '75	Wright, Ronald R. '71	KY B	Ferguson, Keith M. '62	Leds, Thomas M. '85
	Lenzini, Peter A. '75	Berghofer, Fred G. '43		Fong, Ivan K. '83	Lempe, James D. '83
	Lipinski, Paul R. '60	Bonnicchi, Joe V. '49		Guppy Jr., John W. '53	MacIka, Raymond E. '86
	Mikita, Robert W. '54	Carpenter, Stanley R. '56		Hazen, Nathan L. '56	Martin, Edward A. '68
	Neuheller, Vernon C. '59	Fried, Leroy '57		Hadlik, Karen J. '85	Maugh, Roger E. '55
	Neuhallen, Andrew J. '83	Graham, James H. '72			
	Olp, Kenneth J. '87	Hamilton, Charles E. '59			
	Olson, Robert D. '88	Hovda, Keith D. '81			
	Peterson, Chester M. '49	Johnson, William B. '60			
	Rebeschini, Michael E. '77	Mandeville, William T. '71			
	Rose, Richard C. '79	Marum, Steven E. '73			

SECOND CENTURY CLUB, CONTINUED

- Meilinger, Robert B. '34
Miller, Stephen S. '78
Parker, William W. '65
Parsons, Edward S. '80
Pierson, Wilmer G. '73
Pronson, Thomas P. '55
Rigge, Lawrence A. '83
Rogme, Timothy J. '78
Roof, Richard R. '51
Rowzee, Edward F. '65
Simons, James L. '78
Sivier, Kenneth R. '51
Snyder, Robert J. '77
Speth, Adolph P. '52
Stinchcombe, James D. '49
Stoddard, Frank J. '60
Thoren, Theodore R. '32
Tomlinson, Charles L. '55
Travers, Arthur '59
Trecha, Theresa M. '81
Washburn, John R. '69
Wentzel, Richard D. '60
Williamson III, Warren P. '53
Winter, Steven D. '81
Yagle, Andrew E. '78
Young, John G. '39
MI A Arjeski, Eugene H. '51
Brining, Dennis W. '68
Carms, J. Robert '78
Di Cicco, Dominic A. '61
Dubois, Kenneth R. '88
Edward, Robert M. '75
Schalk, Eugene N. '41
Smith, Charles O. '51
Zack, Chester E. '59
MI E Capparò, Michael A. '70
Coleman, Edward R. '57
Czarnota, Paul S. '86
Hock, Roy E. '51
Hong, Albert E. '80
McCarthy Jr., Joseph C. '51
Moses, Michael Joseph '00
Renton, George W. '63
Rodgers, John J. '52
MI Z Foraker Jr., David E. '58
Gillham, Gregory V. '83
Grubbs, Ronald D. '73
Havin, Robert C. '48
Kirsch, Gary A. '75
Kowalik Jr., John '72
Lobkovich, Thomas M. '83
Morel Jr., Lawrence J. '76
Morman, Kenneth F. '58
Nicosia, Peter J. '77
Reardon, Robert W. '74
Roth, Maureen Lynn '91
Sadlo, Thomas G. '77
MI H Allmendinger, Paul F. '44
Nelson, David J. '85
MI Ø Bohdanowicz, Edward '80
Chreston, Kevin J. '82
Edwards, Steven C. '80
Kanfer, Marvin E. '71
Scott, Richard T. '78
MI I Roussel, Gerald M. '84
MI K Sikken, Richard G. '89
MI A Repke, Wesley Ryan '09
MNA Amann, Charles A. '46
Anthes, John A. '34
Avery, Carlos P. '61
Bakke, Carl Alan '88
Benjamin, Harold R. '57
Clarke, Richard N. '53
Fitch, John N. '66
Halladay, Henry E. '64
Hegna, P.E., Harold A. '69
Hennen, Harry A. '66
Holm, John D. '82
Hrycak, Peter '73
Lapakko, Kim A. '76
Magney, Mark C. '79
Maus, Brian W. '81
O'Leary, Stephen H. '69
Petrich, Gale S. '86
Pender, Emil '58
Polacek, James H. '52
Shaw, John R. '59
Torgerson, Brian C. '72
Tran, Binh Van '89
MS A Backus, Patricia M. '78
Barnett, William F. '71
Benton, USAF Ret, William D. '71
Blake, Charles R. '69
Bufkin, James D. '81
Cargile, Jimmie A. '70
Carman Jr., Jack B. '62
Dickson, Ronnie D. '77
Flanagan, James L. '78
Gelman, Stephen '73
Hatmaker Jr., P.E., John W. '79
Hilkert, P.E., James M. '71
Hodge, B. Keith '65
Holeman, James M. W. '81
Jones, Donald B. '51
Kaiser, C. Hayden '52
Kneal Jr., William E. '73
Lucas, Jerry L. '72
Matthews, Gerald A. '69
McDonald Jr., Harold R. '65
Reynolds, Billy '78
Sutphen, Fred M. '73
Tisdale, Stanley R. '71
Tyner, Fred M. '93
Wachs, John J. '71
Ware, Marcus W. '69
Yates, Karen W. '73
Yates, Michael D. '72
MS B Woody, Marvin D. '79
MO A Brown, William R. '74
Burkholder, Scott G. '79
Currie, Wayne L. '59
Fitzgibbons, Thomas J. '87
Geers, Arthur E. '48
Grizzo, Ludwig A. '58
Hammar, Phillip C. '65
Herman Jr., Donald L. '84
Koch, Dale E. '72
Kuehnel, Charles G. '62
Merz, Jeffrey B. '67
Parneter, Richard E. '90
Raines, Gary K. '65
† Rand, Russell W. '42
Zimmerman, Mary M. '87
MO B Arnold, Richard R. '69
Bolnar, William B. '75
Bodenhamer, P.E., Steven D. '75
Buenemann Jr., Morris C. '82
Clemence, Samuel P. '62
Derbak, Charles B. '84
Elfrink, P.E., Lindell H. '62
Fennelwald, Gary '73
Ferrell, C. Stuart '64
Frankenberger, Richard B. '93
Hahn, Gail L. '82
Helwig, Arthur W. '50
Herndon, Richard S. '56
Horstmann, Paul W. '73
Lettermann, Dennis W. '76
McImsey, Edward C. '71
Myers, Kenneth R. '72
Patterson, Michael A. '77
Rizer, Gene C. '60
Scherrer, Paul K. '71
Strohbeck, Eugene E. '53
Unnerstall, James A. '56
Voss, Thomas R. '69
Weber, Albert L. '53
Willoughby, P.E., Ronald D. '73
MO F Diboll, Wallace B. '44
Dyson, Peter R. '80
Eddy, James D. '80
Gatley, William S. '56
Goldring, Stanley '64
Klein, Milton '44
Patterson, Mary A. '72
Rehg, Larry M. '69
Rosencrofter, E. Wood A. '49
Salman, Naif D. '56
Saufmauer III, John '61
Shomber, Henry R. '78
Tilly, John V. '52
MT A Andersen, Viggo '51
Courville, George E. '59
Erickson, Peter B. '56
Kolb, Robert C. '61
Moody, Thomas W. '49
† Quammen, Wallace R. '48
MT B Einhorn, Elizabeth R. '86
NE A Frackhan, Douglas G. '76
Clair, Stephen B. '73
Fuchser, Fay E. '51
Fuerst, John M. '82
Gilbreath, Donald R. '85
Russell, Russell L. '83
Nelson, Stuart O. '50
Paxton, William G. '87
Schaufelberger, Don E. '49
Shanmugam, Alagappan '83
Sneed, Kathryn K. '80
Stelling, Karen D. '87
Stransky, David Wayne '92
Watson, Gene D. '59
NV A Levine, Larry A. '85
Van Horn, Michael D. '76
NHA Amazeen, Bruce E. '65
Bailey, Joseph G. '86
Daniels, Stuart F. '63
Greene, Prescott '57
Loef, Richard J. A. '71
Major, Alfred N. '50
Noyes Jr., Bertram S. '66
Stephens, Jay E. '73
Zecchini, Charles R. '50
NJ A Allen, Samuel M. '70
Berentson, Charles G. '51
Braxton, James S. '37
Carow, Walter M. '50
Carucci, Vincent A. '69
Ghosh, Subhendru '89
Holzenthaler, Lawrence J. '66
Kimmich, Herbert L. '57
Lipton, Sydney '50
Meyer, Alfred P. '60
Murphy, Kevin J. '78
Reinhardt, Gregory C. '65
Rico, Robert P. '70
Tabola, Michael D. '84
Tirado, Daphne C. '82
NJ B Andre, Gerald R. '75
Ayres, Marc C. '84
Babb, John E. '70
Bond, Charles B. '81
Bubnick, David V. '73
Colarusso, Remo J. '83
De Witt, Russell '50
Dola, Steven '55
Torgerson, James E. '41
Kaufman, Peter A. '84
Longo, Robert J. '75
McGord, William F. '64
Shelestak, Larry J. '75
Wasiewicz, Richard A. '69
Wollmann, Norman P. '81
Allison, Nathan C. '80
Amos, Douglas R. '55
Cohen, David S. '47
Constanzo, Steven J. '79
Cordes, Robert G. '48
De Waal, Johannes '70
Gittes, Marvin S. '63
Glick, Robert R. '68
Grant, Douglas J. '68
Hartmann, John C. '51
Hsu, Cheng-Tzu Thomas '64
Leach, Robert J. '82
Lenox, Stanley '44
Minardi, Vincent C. '66
Otterbein, Richard C. '71
Puhan, Robert '75
Reitman, David '65
Rose, William '52
Seibilia, John '89
Spinner, Gerard F. '75
Szebenyi, Thomas A. '69
Tabor, Vincent J. '75
Tubello, Jeffrey '76
Vandemeulebroeke, Leon C. '89
NJ A † Alexander, William B. '41
Brown, Geoffrey S. '83
Coco, Elizabeth H. '87
Gebhardt Jr., Peter T. E. '39
Nash Jr., Raymond A. '60
Nisong, Thomas M. '78
Potts, Richard G. '64
Stern, Hal L. '84
Usas, Alan M. '71
Vendeland, Robert N. '47
Whitesides Jr., Lawson E. '68
Wilke, Jeffrey Allan '89
Yu, Jeffrey C. '89
NMA Fenwick, Danny L. '77
Harcum, Sarah W. '86
James, Ph.D., Jonathan C. '97
Zimmerman, Ph.D., P.E., Roger M. '59
NMB Donnelly, Carolyn Elaine '01
Farber, Martin J. '75
Menako, Jack A. '84
Salas, Thomas M. '85
NMI Bonjomi, Daniel Louis '90
Spicer, Howard A. '79
NY A Au, Peter Yuh Tak '93
Bishop, Bruce S. '80
Blomberg, Richard D. '67
Breckenridge, John Robert '99
Epling Jr., William Y. '83
Franco, Peter F. '76
Lowe, David '81
Morgan, Thomas A. '78
Paparisi, Bill '75
Schreiner, Richard J. '48
Seckler, Howard N. '48
Thomasower, William J. '70
NY B Baleno, Anthony P. '66
Carpenter, Richard C. '51
Chandler, George D. '70
Darling, Jonathan K. '83
Despirito, James '83
Doyle, Frederick J. '51
Eisman, L. Coburn '45
Fedoroff, Oleg V. '61
Glaser, Anthony J. '51
Groy, Anthony G. '84
Kaczmar, Michael J. '72
Landau, Louis H. '49
Leader, Jeffery J. '85
Leung, Chung M. '83
Lynch, Thomas B. '59
Nicholas, Thomas P. '80
Perkins, Richard W. '54
Plehn, James G. '47
Prach, Edwin F. '50
Ragonesi, Louis J. '56
Solomon, Karl '51
Tobin, Michael R. '87
Zastrow, Kenneth D. '52
NY F Aestrum, Robert W. '73
Brand, Terrance Alan '90
Breneman, Scott A. '83
Buck, Frederick A. '76
Butler, Charles W. '50
Dowgwillo, Robert M. '75
Dupier, Dennis G. '61
Fredericks, Robert J. '48
Goldschmidt, David Joel '91
Larden, Stuart B. '66
Jordan, William E. '64
Kaufman, Arthur L. '50
Kerser, Alfred F. '52
McKersie, Alan D. '52
Miller, John H. '53
Miller, Robin T. '85
Mueher, Craig A. '82
Niederer, Melvin M. '82
Place, Harry G. '51
Savage, Robert E. '43
Schrier, Steven B. '82
Schultz, Stephen F. '70
Stull, Frank D. '51
Veldman, P.E., John P. '70
Wadsworth Jr., Winthrop '76
Wild, Donald S. '50
Wilkinson, Richard W. '51
Yarus, Steven '63
Zimman, Walter F. '51
Zimroczek, Leon A. '78
NY A Bauer, Douglas C. '61
Carino, Nicholas J. '69
Fuchs, Richard H. '71
Goldstein, Steven M. '81
Koltz, Mark N. '71
Heineman, Duane T. '58
Hodgson Jr., Edward W. '68
Holmes, D. Brainerd '43
Jeckovich, Stephen '47
Johnson, Eric Tanner '90
Kahn, Mindy '89
Kingston, William J. '50
Klepeis, John E. '85
Kneen, Phillip H. '58
Kuehne, Donald L. '73
Matyas, Robert M. '52
Sasso, Joseph A. '67
Van Arsdale, George D. '62
Winkle, Roger A. '67
NY E Bernstein, Joseph H. '50
Dobbins, Bob M. '73
Feldman, Robert E. '59
Grace, John T. '65
Hoffmann, Donald H. '62
Jaasma, Edward '59
Kuhn, Alfred '57
Lavin, Joseph M. '73
Ueber, Russell C. '61
Wechter, Saul H. '54
Weissman, Martin J. '58
Chu, Lawrence '71
Cook, Robert J. '67
Kaczmarek, Richard '73
Keller, Norman K. '58
Pawelko, Michael J. '53
Schmurr, Albert A. '62
Tuchband, Stuart M. '63
NY H Brose, Richard F. '63
Cirrone, Dennis J. '67
Giusti, Victor F. '41
Horan, Frank J. '71
Kisilevich, Aleksandr '97
Kushel, Glenn R. '75
Leventer, Wilbur A. '49
Lum, Jean Ping '85
Metzger, Ernest H. '49
Peaceman, Donald W. '47
Yee, Donald W. '75
NY Ø Atwood, Leon W. '48
Candelero, John Phillip '91
Crompton, Kenneth H. '67
Dec, Eugene B. '72
Donovan, Kenneth B. '78
Gray, George A. '43
Gronosky, Clifford F. '58
Grubb, Michael A. '75
Hamm, Jeffrey H. '74
Jumps, Carl F. '50
Kaylor, James M. '88
McKenney, John L. '62
Meyer, Bruce G. '69
Newman, Mitchell J. '81
Thomas, Alan A. '86
Tracey, Michael S. '86
NY I Boehm, Robert A. '76
Gallo, Anthony M. '79
Grant, Richard J. '88
Hartmann, Hans G. '78
Hoffer, Jeffrey E. '71
Kalian, P.E., Arianna '88
Levine, Abraham '50
Millman, David S. '72
Selinger, Carl S. '67
Teitelbaum, Howard A. '79
ULrich, James W. '61
NY K Ablowitz, Mark J. '67
Allyn, Elwyn G. '61
Curtis, Johnson O. '66
Dennis, William J. '74
Moskowitz, Ira '78
Muller-Graed, Otto T. '52
Schlosser, Paul M. '82
Shebert Jr., Leonard L. '84
NY A Di Miceli, Angelo A. '82
Ganetis, George L. '78
Miller, Vicky C. '83
Rigert, John A. '70
Zizza, Michael '51
NY M Goldreich, Joseph D. '45
Hansen, Jean G. '77
Meador, Lyla R. '86
Renzi, Leah F. '80
Rest, George B. '75
Salmon, Roger O. '66
Willis, Michael J. '82
NY N Aloysius, Ronald J. '85
Barnes, Robert Edward '84
Darroch, Richard E. '84
Davis, James S. '70
Frick, James A. '83
Gough, John W. '50
Hammond, Paul G. '72
Hennesen, Roger C. '70
Humphrey, David K. '67
Kocher, Lawrence '67
Kuberka, Salvatore '80
Lauermann, Mark E. '92
MacLagger Jr., Robert C. '73
MacNeil, Randall L. '69
Morris, George C. '63
Niding, Theodore G. '75
Pardini, Thomas J. '77
Stearns, Richard E. '67
Tabaczynski, Rodney J. '66
Weber, Thomas W. '53
NY E Ball, Michael J. '72
Boyle, Charles J. '76
Defelice, Nicholas J. '77
Kiely, Robert, Stuart '51
Machuca, Luis A. '69
O'Keefe, Luke F. '80
Raczko, Robert F. '79
Sanderson, Ellen L. '81
Tamaru, George John '59
Triano, Salvatore J. '85
NY O Doynow, Donald '75
Hofmann, Linda '79
Jankowski, Cecelia '81
NY II Barber, R. Todd '87
Brol, Michael W. '83
Handlik, Jeffrey Patrick '89
Hoelscher, James R. '71
NY P Abreo, Leslie Anthony '97
Faeth, Mark T. '78
Lubrano, Michael '80
Wong, Wai Kin '85
NC A Alexander, Ralph B. '76
Allen, William D. '82
Ammons, Andrew L. '82
Burkart, Alex R. '72
Capps, Dickson M. '75
Clark, Jennifer A. '55
Cline, Arthur A. '49
Cotton, Thomas C. '71
Daniels, P.E., Eric A. '85
Davis, John Michael '73
Doggett, William R. '86
Florence Jr., James S. '65
Franke, Deborah A. L. '85
Frierson, J. Lawrence '66
Holum, Stuart B. '65
Hood Jr., Edward E. '52
Hutcherson, Rodney N. '82
Karesh, Lewis J. '81
Leonard, Gerard E. '50
Maybee, Clarion L. '70
Mitchell, Glenwood '60
Morse, Charles Allan '89
Quillan, Ann M. '85
Shelton, Monty L. '84
Stier, John L. '66
Teague, Lisa J. '81
Trivette, Wendell A. '82
Weiss, Vincent Gregory '91
White, Samuel E. '69
Wicker, Robert E. '74
Wilson, Mark P. '79
NC F Baxley, William A. '65
Behken, Kenneth C. '87
Eversett, Robert '42
Hansen, Mikkel A. '78
Hustvedt, Kent C. '75
Maxson, Robert J. '62
Murray Jr., Malcolm G. '52
Peters, William T. '59
Williamson, Max L. '50
NC A Clark, Michael J. '75
Gather, Allen Wayne '96
Le Groner Jr., Durrall T. '80
Zahn, Thomas L. M. '84
ND A Delkin, Earl C. '58
Engelbrecht, James R. '75
Ganfield, Paul A. '88
Melanson, Harold G. '69
Sack, Larry E. '59
Shannon, Sidney R. '36
Wiechmann, David P. '85
Dehen Jr., James J. '80
Jesh, Mark E. '86
OH A Allison, James F. '57
Ammar, Gregory S. '81
Beach, Robert C. '56
Drier, Delmar W. '52
Garman, Kenneth C. '44
Gropp, William R. '75
Hecker, Ph.D., Siegfried S. '65
Hoh, Ka-Pi '84
Kitinjoja, Elmer A. '53
Kownacki, Edward J. '67
Maneri, Remo R. '69
May, Ronald A. '89
Mergler, Harry W. '48
Michal, Gary M. '75
Obiak, John M. '62
Reilly, James A. '39
Richenbacher, Wayne E. '75
Rodriguez, Ferdinand '50
Schmerger, Thomas R. '50
Skaras, John '73
Strawbridge, Charles E. '81
Tomasch, Walter J. '52
Weddell, James K. '76
Zarilla, Ronald W. '61
OH B Allsapp, Eugene R. '70
Bach, Wayne S. '72
Bingober, Robert O. '69
Burroughs, Robert K. '58
Christie Jr., Ralph W. '73
Dobashi, Harry H. '68
Ferris, Michael '64
Hart, Thomas R. '66
Hersman, Jill Ann '52
Lent, Richard R. '66
Lyon, Bruce V. '70
McCarthy, Martin D. '70
Olt, Richard A. '80
Pick, Gregory A. '84
Robinette, Lisa Marie '03
Thompson Jr., John R. '50
OH F Armstrong, Robert J. '61
Beitler, Richard S. '50
Billmire, David A. '72
Booker, Stanley '86
Bressler, David Michael '98
Brosius, Allen D. '48
Carr, Stephen J. '70
Case, William F. '64
Chadwick, Harold E. '65
Davis III, Curtis W. '73
Dyer Jr., C. James '54
Edwards, Dale C. '61
Edwards, William R. '71
Fill, William K. '47
Frey, Mary E. '89
Grandle, Lawrence '40
Hawk, Ellis L. '50
Jester, Donald J. '67
Kohls, Thomas C. '81
Kovach, Karl D. '85
Latimer, Trent W. '57
Mendelsohn, Richard H. '71
Mieselman, Gordon K. '48
Piadars, Valt's '56
Risch, Gary A. '76
Rose, Ralph '42
Shade Jr., Willard N. '70
Stumbaugh, Gary A. '66
Taylor, Ashley '84
Verner, William J. '58
OH A Dinose, Nicholas '55
Keith, Charles L. '74
Kendall, Harold B. '48
Lytle, James R. '51
Nussbaum, Leo E. '68
Wuerdemann, Robert C. '69
Zajac, Theodore S. '52
OH E Batiotti, Janice L. '78
Baron, Robert E. '57
Egger, Robert A. '85
Evans, John A. '59
Prytzel, Thomas R. '88
Ross Sr., David E. '73
OH Z Allman, Susan J. '85
Bubula, Maria '89
Bushey, Bruce C. '84
Cheney, Richard F. '75
Dembrow, David W. '82
Goodwin, George '72
Proctor, Margaret P. '82
Robert, Kenneth J. '68
Seow, Kee Chong '88
Stepp, Edward E. '55
Trepsinski, Charles P. '70
Weaver, Ernest W. '43
OH H Ball, USAF Ret, James A. '65
Brewder, Andrew J. '70
Campbell, USAF Ret, John J. '76
Clarke, DeFrance '81
Crowder Jr., George E. '77
Duvall, David John '88
Eggers, James A. '72
Freyer, Gustav J. '60
Gilbert, John E. '70
Hastings, Harold L. '78
John, George '48
Kelso, T. S. '84
Leifeste, Samuel E. '63
Menna, Richard J. '62
Miller, William G. '83
Niemyer, Thomas B. '85
Settecerri, Joseph J. '78
Shine, Andrew J. '85
Smith, Russell H. '63
Tammen, Peter D. '57
Van Veldhuizen, Ph.D., David A. '99
Wolfe, Stephen A. '85
OH Ø Decker, John W. '65
Evanzija, Gregorio P. '64
Kamowsky, Dennis D. '73
Kramer, Lawrence J. '62
Miller, Michael L. '78
Rall, Richard M. '56
Sink Jr., Robert Dean '87
Usleman, Robert T. '71
Wild, Joyce R. '89
OH I Barth, Herbert G. '61
Talbert, Leon O'Connor '55
OH K Bennett, Ronald Q. '76
Brattoli, Mark A. '79
Carver, Robert M. '87
Duffy, Stephen J. '75
Morrison, Donald Paul '89
Paridon, Charles A. '78
OH A Hallocak, Andrew J. '77
Oliker, Robert R. '77
Suhar, Alan W. '86
Stihar, P.E., Richard A. '83
THrack, Mark E. '76
OH M Montgomery Jr., William Lee '86
OH A Bert, Charles W. '51
Burton, Donald O. '71
Dotson, Neil A. '84
Dunn Jr., Robert O. '82
Griffin, James P. '75
Hardy, William C. '53
Kerr, Clayton P. '61
Lamp, Maurice B. '89
Leaman Jr., Gordon J. '73
Wustenberg, John W. '78
OH B Davis, Linda R. '75
Hart, Richard P. '75
Harper, Lois M. '86
Price, David W. '75
Weston, Kenneth C. '55
OH F Dean, Philip M. '74
Diggs, Robert A. '74
Jones, James R. '71
Lewis, William J. '84

SECOND CENTURY CLUB, CONTINUED

	Morgan, Johnny J. '88	Hennessy, John L. '73	Devaney, Harold E. '62	Mathews, Douglas J. '81	Thomas, Richard H. '63
	Pratt, David B. '77	Lacz, Walter '69	Harvey, James B. '63	Potvin, Alfred R. '64	Trinka, John T. '69
OR A	Sneed Jr, Albert L. '79	Lombardi, Charles G. '65	Pedigo, Donald B. '82	Schaeper, Wilfred H. '76	Bruzer, Kurt W. '51
	Beals, William Jr., Philip V. D. '61	McLaughlin Jr., Phillip V. D. '61	Thompson Jr., William '68	Williams, Larry D. '80	W B
	Cantwell, Gary K. '80	Norris, Clinton J. '61	TN A Luttman, Mark J. '82	Fong, Keith Batchelor '88	Fong, Keith Batchelor '88
	Ethington, Howard C. '51	Orsatti, Louis G. '66	TN E Funderburk, Rodger Miles '89	Fong, Maria D. Chee '91	† Derra, Kenneth William '90
	Ewing, Robert C. '43	Russo, Richard A. '68	Noite, Jennifer Vanderjagt '77	Van Landingham, David J. '74	Ellis, Thomas E. '84
	Laos, Oscar J. '51	Volkay-Hilditch, Christine M. '83	Noite, Paul A. '77	Harris, E. Douglas '83	Jilek, Carol B. '84
	Loughmiller, Bert E. '64	Warczyglowa, Clarence A. '76	Sanders, Darren John '90	† Shepherd, Glen C. '77	Kormank Jr., Nicholas J. '62
	Marsa, Arnold R. '45	Crystal, Luciano M. '72	Abad-Fits, Carmen B. '80	† Carter, Jason G. '85	Kriofsky, Thomas A. '60
	Pengelly, David D. '78	Dehoff, Gregg A. '86	Anderson, John E. '87	Carter, Norman B. '87	Laidig, William R. '49
	Sato, Ben '57	Haigh, P.E., Bruce W. '71	Angel-Jaramillo, Danilo '61	† Casada, Jerry J. '82	Lugthart, Cornell W. '51
	Shaw, James W. '70	Schoenberger, Lewis R. '84	Boatright, Modly K. '56	Olson, Kent G. '65	Marcouillet, Roger A. '60
	White, David C. '46	Smith Jr., Donald Benedict '91	Cardwell, John W. '68	Patrick, William M. '74	Noelle, Wayne E. '67
	Wilson, Robert E. '55	De Burlo Jr., C. Russell '47	Chiang, Raymond W. '86	Spong, Robert N. '79	Penlesky, Richard J. '73
PA A	Altman, Frances B. '80	Shield, Carol K. '84	Courtney Jr., Lonzo C. '58	UT † Leave, Mary L. '79	† Jacek-Roppella, Kristina M. '85
	Bradley, Gordon H. '62	Snosco, David J. '81	Dodge, Nathan J. '68	† Panatier, Michael J. '71	Pickett, Mark A. '72
	Cahoon, Robert L. '43	Kulik, David B. '83	Dolezal, Donald R. '65	Torgesen, Greg L. '80	Raach, William G. '81
	Clegg Jr., Lee M. '59	Musselman, Thomas A. '73	Forster, Paul A. '57	VT A Bingle, Bernard J. '74	Schutz, Ronald J. '78
	Doumaux, Arthur R. '61	Rath, Dean J. '78	Fuller, William B. '82	Simonetti, William J. '59	Simon, James B. '65
	Engel, Heinz '52	Schurko, Robert J. '78	Glasow, Brian Scott '99	Cook, Barbara K. '84	Sprang, James R. '57
	Goldsborough, John P. '56	Taylor, Thomas R. '73	Hageimer, Hal E. '72	Garno, Douglas T. '58	Throckmorton, Kenneth L. '45
	Gresner, Alan Joseph '60	Rodriguez-Peraza, Jose R. '64	Henry, Wesley B. '51	Godlard, Eric H. '86	White, Peter E. '62
	Haas, Joseph William '90	Santiago-Rivera, Pedro '94	Horton, Larry D. '82	Kellogg, David H. '62	W I B
	Hittinger, William Charles '44	Dicamillo, Peter J. '75	Howerton, Lloyd F. '51	Shtatz, Jonathan A. '82	Bomba, Steven J. '59
	Horgor, Theodore V. '61	Newman, Gary R. '73	Huang, Lawrence P. '81	VT B Dekalb, Shawn W. '85	Brengoso, Mary K. '78
	Jones, Donald P. '65	Steele, James H. '49	Jones, Morris B. '52	Henry, Thomas A. '70	Hanson, David L. '86
	Knorr, David B. '74	Townsend, James C. '60	Kassler, Harlan Larry '91	VA A Ashton, Michael D. '74	Jendrzejek, Gary S. '75
	Koppes, Alan W. '53	Waibel, Brian J. '87	Kopecy, Johnny A. '65	Banning, Pamela D. '85	Jenn, David C. '75
	Letch, Donald G. '66	Wickham, Richard E. '59	Kothman, Richard A. '59	Barbes, Lowell P. '87	Stachowicz, Robert W. '70
	Malkemes, Kenneth L. '83	Aubin, Timothy Francis '94	Le Bleu, Brian B. '65	Barrell, Charles D. '80	WI A
	Marshall, Steven J. '82	Fletcher, Gilbert A. '68	Loring, Mark P. '87	Capon, Robert S. '80	Wang, Daniel Edward '91
	Melvin, William Larkin '89	Hurdis, David A. '62	Malins, Chester J. '76	Dye, Michael L. '87	WYA
	Middiff, Alan H. '85	Karnes, Jeffrey S. '80	Matlock, John H. '67	Forziati Jr., Kenneth T. '92	Carroll Jr., William E. '69
	Newhard Jr., Fred J. '50	Kolb, Robert A. '66	Nix Jr., Cecil A. '57	Heim, Donald J. '50	Galles, Daniel J. '74
	Oertlieb, John H. '52	Lamoureux, Suzanne M. '82	Peterson, Robert A. '80	Austin, Robert C. '69	Riley, Robert H. '82
	Pondo, Fredric '75	Lieberman, James '67	Reese, Francis E. '75	Laforde Jr., Stanard F. '55	Rodriguez, Janet L. '95
	Renshaw, Daniel T. '81	Post Jr., Arthur H. '57	Sorber, Charles A. '61	Mizzelle, Peter P. '60	Scharton, Craig '85
	Sebold, P.E., Grendon K. '42	Procaicini, David A. '65	Stanbery, Sam R. '64	Powell, Joseph B. '78	Schoenborn, P.E., Renee M. '85
	Stockham, Herbert C. '49	Silva, Ronald E. '74	Thompson Jr., Chaunce O. '53	Price, Michael G. '74	Scott, Barbara J. '73
	Stutzman, Mark C. '81	Smith, Robert A. '83	Trutna, William R. '73	Beard Jr, Frank H. '86	Simon, Ronald W. '81
	Tovlka, William E. '62	Spinik, Sydney '58	Whitesides Jr., John L. '65	VA B Cundiff, Michael J. '43	
	Vosseller, Kenneth F. '62	Verrier, Donald C. '54	Wahl, Catherine '88	Dalton Jr, Eddie G. '84	
	Wentzel, Alan R. '75	Withrow, Gregory L. '80	Zuernemann, Gregory R. '76	Dawson, Herbert M. '61	
PA B	Anderson, Ray E. '50	Bethea, Thomas J. '58	TX B Berthold, Kristopher David '04	Keckler, Claude R. '63	
	Carretti, Katherine G. S. '84	Blandford Jr., Joseph B. '58	Easterday, Mark L. '84	Lechner, Richard A. '59	
	Cashdollar, Barron H. '57	Brown Jr, Bevan W. '49	Geske, Robert D. '72	Maloney, Melissa M. '90	
	Creerath, Harold E. '60	Davenport, Charles Franklin '79	Hood, David L. '73	Nay Jr, Marshall W. '63	
	Freney, Jack H. '60	Di Lapi, Christine M. '87	Newatson, Adam A. '61	Painter, Robert A. '48	
	Gibson, John P. '64	Drennon Jr., Robert F. '70	Jain, Ravinder K. '71	Ray II, Robert E. L. '74	
	Jammal, Joseph N. '50	Fowler, John W. '48	Kunkel, George C. '54	Rorer, William R. '71	
	Kardos, John L. '61	Gray Jr., Blaine E. '72	Marasco, David F. '87	Smith Jr., Sidney C. '63	
	Matthias, Tracey D. '89	Johnson III, Wilson U. '82	Moore, Bruce F. '47	Teacy, Charles F. '75	
	McGovern, Patrick John '90	Martin J. Campbell '48	Nail, Albert A. '57	VA † Austin, Charles '89	
	Mechley III, Daniel G. '47	McGormac, Jack C. '48	Newkirk, Todd '87	Mahaney, P.E., Jack M. '82	
	Mols, Gary E. '77	Mims, Paul W. '71	Olson, Rebecca J. '61	Richmond, Mark David '98	
	Pasko, Thomas J. '59	Paskel, Shella Ann '86	Osborne, David C. '75	Sturm, Carroll C. '78	
	Paul, Frank W. '60	Peters, William J. '70	Smith, David L. '71	VA A Brenner, Joseph R. '55	
	Pollock, Richard E. '53	Prothro, Joseph E. '63	Soules, P.E., S.E., James G. '79	Bunch Jr, Jennings B. '50	
	Replogle, Joe O. '52	Stecker, Marc K. '82	Upchurch, James A. '76	Gehr, David R. '88	
	Ripson, George W. '60	Wallace, Winston E. '74	Walter, Kevin Carl '88	Payne Jr., Lewis F. '67	
	Smith, Charles J. '42	Williams, Rick L. '81	Williams, David C. '47	WAA Brewer, Brian J. '82	
	Smith, Donald D. '48	Wickler, Elizabeth Elaine '98	TX † Avant, Richard L. '83	Chandler, Alan S. '77	
	Thiem, Carl W. '70	Fischer, Belinda Ann '94	Capshaw, David M. '80	Chin, Ark G. '50	
PA †	Chan, Allen H. '82	Haggerty, N. Kent '72	Chisholm, Roy D. '48	Dean, Kenneth R. '49	
	Gilson, Robert D. '36	Lang, Christine P. '80	Cox, William E. '76	Fosberg, Theodore M. '59	
	Hudson, Robert H. '77	Shull Jr., Daniel S. '51	David, Anne W. '87	Hage, Robert E. '89	
	Kornuta, Nick D. '60	Skvoretz, Jonathan Maxwell '95	Dobins, Porter K. '56	Hammersand, Fred G. '49	
	Kromer, Robert P. '82	Walden, Gary R. '81	Fisher, John D. '70	Ii, Mutsuya '85	
	Marietta, William G. '68	Adkins Jr., Henry G. '66	Grissold, Ronald K. '71	Larkin, Robert S. '61	
	Riedel, Frederick W. '68	Cochrane, Jerry W. '55	Horn, Kenneth P. '61	McGuire, Jeremiah J. '77	
	Rouleau, Wilfred T. '51	Fletcher, Robert H. '64	Hunter, David G. '79	McKees, Jackson L. '68	
	Rudolph, Anna B. '79	Gustafson, Richard A. '63	Kobayashi, Riki '44	Miller, Stefan '90	
	Rung, Robert D. '70	Jones Jr., Howard C. Carlisle '50	Koonce, Kenneth T. '60	Moose, David M. '54	
	Spector, Scott J. '54	Lindsay, Craig T. '86	Larkin, Robert P. '56	Orr, Peter C. '71	
PA A	Banks, Daniel '54	Marbois, Matthew C. '81	Lesser, Herbert A. '60	Porte, Jeffrey A. '77	
	Black, David L. '83	McKnight Jr., Clarence E. '52	Lucas, Raymond D. '60	Sarahy, Catherine P. '72	
	Bolton, Wallis D. '50	Mello, William James '97	Poppewell, Thomas R. '74	Sahakian, Zareh M. '80	
	Hocker Jr., Robert G. '71	Smith Jr., Isaac D. '60	Sick Jr., William N. '58	Saxberg, Bror V. H. '80	
	Hoffer, Norman K. '81	Wertheim, Robert Halley '45	Smith, Fred L. '62	Searing, John E. '68	
	Lewis, Timothy D. '76	Berggren, Thomas K. '76	Smith, John C. '89	Simpson, David P. '76	
	McIlvain, Donald R. '52	Brass, Lorin L. '75	STERLING Jr., Albert A. '39	Steinhauer, Loren C. '66	
	Nackoney, Ogden G. '63	Eisenbraun, Daniel D. '75	TX A Anderson, Byron H. '54	Stiegler, Joseph E. '58	
	Sern, Stacey D. '86	Johnson, Jerry Allen '92	Balusek, David K. '82	Tamada, Henry S. '49	
PA E	Amman, Richard W. '64	Massie, Larry W. '82	Bentnick, George C. '76	Windlell, John C. '58	
	Batdorf, Harold A. '70	Putnam, Anne Michelle '05	Boortz, Martelle J. '77	WAB Aaserude, Robert G. '84	
	Boyles, Bruce W. '76	Rabenberg, Lisa Evelyn K. '78	Bradford, Craig Allen '93	Barlow, Thomas M. '57	
	Cook Jr., Eugene M. '58	Stieha, John K. '88	Brittan, Charles L. '65	Campbell, Ralph H. '51	
	Crouch, George W. '38	Vosika, Janice L. '81	Carta, James K. '83	Coman, Paul Daniel '03	
	Donofrio, Robert A. '71	Brewington Jr, P.E., Percy '54	Caso, Gregory S. '87	Cook, Michael P. '75	
	Felsenheld Jr., Robert A. '58	Conway, Tammy K. '82	Coman, Paul Daniel '03	Neisler, Paul F. '66	
	Guest, Frederick C. '59	Davis, Jack L. '59	Ellison, P.E., Brian Kirk '97	Ellison, P.E., Brian Kirk '97	
	Hagador, H. Frank '50	Dodge, Franklin T. '60	Fox Jr., Milden J. '49	Fox Jr., Milden J. '49	
	Hermann, Frank V. '50	Ellis, Jeffrey Thomas '93	Frank III, Henry G. '77	Garner, Scott J. '77	
	Matsumoto, Tadashi '60	Evans, Colby Russell '94	Handwerker, Robert L. '65	Gray, Foster L. '53	
	Murgas, William J. '53	Garber, Joel W. '61	Hudson, Steven M. '77	Hanover, Jose G. '47	
	Nolan, Christopher W. '86	Heathington, Kenneth E. '61	Kasprovic, Daniel E. '61	Herring, Robert G. '65	
	Raver, Roland '35	Hickman, Charles E. '57	Kramm, Robert C. '81	Scott, Norman R. '58	
	Rodite, Robert R. R. '64	Hinsdale, James G. '41	Lam, Carroll F. '58	Turner, James A. '50	
	Roth Jr., David '78	Hunt, Roy J. '67	Malone, William '59	Healy, Timothy J. '58	
	Ryan, Richard E. '86	Jackson, Karen E. '81	McGinnis, Charles I. '49	Lock, Raymond T. '83	
	Steel, Henry W. '58	Jenkins, Alvin L. '61	Mitchell, Melvin M. '52	McCaughey, Edward W. '53	
	Stratton, Carl W. '81	Jennings-King, Sherry D. '93	Moser, John H. '56	WVA Boggus, Mark S. '80	
	Yoder, Paul E. '49	Ke, Bennie F. '71	Muldrow, Grady M. '89	Deakins, Ralph R. '58	
	Young, Douglas A. '86	King III, Philip W. '66	Nitsch, Milton W. '56	Dean, Roberta A. '85	
	Ziegler, Donald G. '82	Lillard, James D. '75	Paul, Thomas C. '62	Griffith, Robert R. '49	
PA Z	Boron, John F. '53	Madison, James M. '71	Peurifoy Jr., Robert L. '52	Hargett, Donald R. '65	
	Chatman, William C. '52	Miller, Freddy M. '79	Pickett, Dennis G. '87	Naper, Richard S. '71	
	Duda, George E. '77	Montague Jr., Charles A. '51	Pulley, Paul W. '72	Pennline, Dennis E. '73	
	Durant, David P. '67	Newton, Louis M. '49	Rollins, Albert W. '51	Ramsley, Walter J. '74	
	Eisenberg, Eric Jay '88	Osborne, Bernie B. '86	Stoecker, Arthur J. '49	Schuler, Arthur K. '71	
	Hodson, William R. '69	Pawel, Richard E. '53	Swinik II, Marvin N. '80	Sutton, George E. '48	
	Hon, Alva '57	Purell, Homer W. '73	Wallace, Charles E. '66	Zimmerman Jr., Albert R. '58	
	Hudak, Joseph D. '77	Reedy, Joe P. '55	Williams, Walter L. '49	WVB Stevens, Ellen V. '84	
	Johnson, Robert C. '70	Richardson, Samuel '97	Woram, Brian J. A. '81	WI A Torre, Linda R. '83	
	Kirsch, Paul A. '75	Riggs, P.E., Donna R. H. '90	Wuensch, Ronny W. '83	WI A Antolovich, Stephen D. '62	
	Leidigh, Thomas J. '49	Rosenberg, David '53	Brown Jr, Thomas B. '72	Bernstein, Theodore '49	
	Morris, Robert '65	Sarnalik, Jagadishchandra '81	Douglas, William J. '70	Bolender, John W. '90	
	Nadzzi, Mark Ellsworth '99	Scandling, Thomas W. '49	Martin, Samuel R. '83	Bruley, Duane F. '56	
	Pechulis, Michael John '97	Shane, Richard M. '62	Palavan, Jim A. '82	Burstein, Victor J. '40	
	Poplawski, Edward G. '80	Sheffey, David W. '66	Ryan III, James J. '70	Collins, David Y. '48	
	Ricci, Anthony G. '60	Stewart, John W. '65	Taylor, Mark E. '83	Davis, Scott P. '78	
	Rummler, William D. '59	Tarrant, Charles H. '57	Taylor, Shayla E. '83	Dodd, Richard A. '44	
	Schubel III, Charles W. '60	Taylor, David R. '69	Triola, Larry C. '75	Goehring, Henry G. '57	
	Shaffer, John J. '75	Whitehead, John C. '61	Turung, Brian E. '87	Hoffman, Carl A. '85	
	Silvasi, John J. '64	Zimmerman, James L. '58	Valka, William A. '75	Holzman, Perry A. '85	
PA H	Brouse, Eric L. '67	TX B Brown, George A. '55	Wambach, Robert R. '86	Keck, Paul D. '73	
	Hoves, Michael L. '75	Gray, William H. '70	McCaleb, Jesse E. '64	Martell, Donald L. '60	
	McDonnell, Robert W. '48	Keaton, Kathryn M. '76	Norwood, Larry D. '73	Martinson, Lloyd W. '57	
	Price, Russell '72	Keaton, Lawrence T. '71	Pulley, Debra D. '78	Mullins, Brian W. '77	
PA †	Braun, Robert '72	Lawson, Douglas K. '82	Reynolds, Robert W. '82	Rozek, John S. '52	
	Caggiano, Nicholas J. '78	Macchio, Gregory F. '84	Storesy Jr, Arthur L. '65	Senty, James A. '60	
	Coyle, Todd F. '77	Nicolaidis, Michael F. '82	Benson, P.E., Marvin D. '79	Shimko, Dan L. '55	
	Dever, Patrick Brian '94	Petersen, Eric S. '84	Bishop, Neil E. '66	Knopp, Gordon W. '73	
	Dugandzic, Joseph P. '83	Pulley, Robert S. '89	Collins, Clyde R. '69	Koppany, Charles R. '63	
	Fozz, Geza '63	Ruel, Phillip Ray '95	Keck, John C. '95		
	Girondo, Dominic P. '70	Denny, Hugh W. '60			
	Grana, Peter N. '73				

FOUNDER'S CLUB

AL A	Anderson, Pete L. '75	Anderson, Gary Dean '89	Carey, George W. '69	Essing, John E. '67	Fitzsimmons, Timothy E. '80	Gentile, Zachary J. '83	Hardy, Joseph F. '74	Hawkins, Lawrence A. '81	Miller, William A. '67	Moore Jr., Sidney C. '63	Rutledge, Walter H. '78	Shivers, Charles H. '75	Singley, John C. '73	AL B	Anderson, James R. '87	Andrzejewski, Joseph Richard '90	Ashcraft Jr., James H. '78	Abacoek, Roger L. '57	Bannach, Robert J. '72	Carr, Emily J. '77	Davidson, Janet Sims '78	Gogan, Harry L. '48	Grider, Kelly V. '58	Hayes, Raymond C. '54	Heaton, Roy G. '42	Pearson, Charles E. '63	Sims, Kenneth L. '71	AL †	Guest, James Mark '89	Purecell, George R. '40	AL A	Fortune, Ph.D., P.E., Juliana L. '01	Harris, Mary Jo Kurcz '84	Hitt, Matthew '90	Selby, Michael W. '96	AL E	Zoulin, Alexander Joseph '91	AK A	Leonard, Leroy E. '72	McPadden, Terry T. '60	AZ A	Coxon, Moran '54	Fellner, Kenneth M. '84	Flanagan, Joseph E. '63	Holsclaw, Lynden E. '73	Howard, R. Stanley '51	Kamel, Hussein A. '55	Krauss, Leroy E. '50	Mahr, Eric Michael '97	Park, Trevor Howard '97	Shaver, Frederick W. '55	Svensson, Arthur '66	Venn III, Robert J. '70	BE	Beemer, Jeffrey B. '80	Forster, Karl D. '86	Harary E. R. Robert M. '82	Hishop, James S. '69	Kersten, Robert D. '49	Takinen, Scott A. '79	Wilson, Richard A. '72	AZ †	Davis, Edward Trevor '91	Fikes, Alan D. '85	AR A	Jackson, John G. '38	Lehen, Robert Anthony '90	Little, James H. '53	Magness, Joe D. '55	Moody, Charles R. '58	Raymer, Harold G. '68	Williams, Curtis R. '83	CA A	Bruemmer, Timothy M. '84	Chan, Sunney I. '57	De Maria, Charles D. '41	Gordon, Hugh O. '41	Humphries, George B. '51	Leu, Dale K. '76	Morhiro, Steve '79	Sherry, Oleg D. '45	CA B	Anderson, Tway W. '44	Crough, Gene A. '69	Hearn, David R. '
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FOUNDER'S CLUB, CONTINUED

	Lawson, William E. '62	Klinker, Robert J. '50	Kraft, Donald E. '52	Falk-Thompson, Elizabeth A. '84	Flynn, Paul D. '48
	Marcu, Bogdan '96	Primeaux, Paul R. '67	Kueck, Thomas L. '64	Gilman, Everett L. '51	Gneiting, Charles R. '61
	Oslick, Harvey R. '80	Trimbell, Thomas S. '70	Lazerotti, Louis J. '60	Grabowska, David G. '91	Hall, H. Thomas '56
	Rey, Daniel '96	Vezquez, Jose T. '78	Madsen, Wayne A. '60	Hemken, Peter C. '77	Harris, Matthew '98
	Roum, James H. '87	Walker, Colleen Anne '94	Marlowe, Lyle H. '65	Houston, M. Dean '55	Howard, John E. '65
	Stokes, Hayman W. '50	Watson, Donald E. '49	Michlovich, Michael S. '81	Houston, Melissa Kay '95	Loran, Jordan Richard '89
	Yamashiro, Keith K. '79	Berzins, Valdis '75	Nemivant, Kathleen Durkin '94	Houston, Scott L. '95	Lochan, Richard C. '48
CA E	Argabrite, A. Hugh '53	Bryant, Howard H. '50	Palkovic, Victor J. '41	Irvine, Alexander J. '79	Muffley, David D. '84
	Farr, Roger D. '70	Peterson, Fabian R. '51	Person, Burton C. '68	Jr. David C. '64	Myers, Arthur K. '70
	Forman, Barry J. '60	Baldwin, Lionel V. '54	Keene, Alice F. '65	Kline, Roy L. '35	Ver Valen, Henry C. '73
	Hardy, Frederick W. '65	Dadd, Jeffrey Scott '97	Reber, Russell H. '59	Koester, David J. '79	Wallace III, William E. '86
	Lepore, Robert G. '76	Jones, Donald E. '77	Resman, Tom A. '82	Ritt, Rick A. '52	Wills, James E. '76
	Miller, Richard E. '87	Bridges Jr., Roy D. '65	Crews, Mark Conrad '82	Sample, P.E., Steven B. '62	MDB Alexander, Dwan W. '74
	Nelson, Alphonzo G. '69	Berger, Ph.D., Toby '62	Ohn, Seymour B. '42	Orenson, Gregory Erik '03	Amtmann, Louis G. '66
	Rav, Harold B. '63	Freedman, Raymond J. '52	Gerson, Gordon '58	Steffen, James J. '74	Birkmire, John Christopher '95
	Slutzkin, Charles H. '57	Kaufman, Earle B. '42	Ljung, Michael Allen '92	Stubenauch, Carl F. '62	Cederman, Candace F. '82
	Sesutu, Louis '65	Mac Donald, Verne H. '64	McEligott, Donald M. '52	Thomas, Lawrence E. '75	Carwin, Robert L. '62
	Struhl, Stanley F. '61	Mengwall, Martin Lennart '94	Wengwall, Martin Lennart '94	Tonelli, A. Duane '57	Errera, David R. '75
	Tamanaha, Howard S. '77	Sturley, Richard '49	Zartman, William N. '56	Wallace, John R. '61	Hornor, Matthew Lewis '01
	Testa, Lori Ann '01	Terry, Elene Sharon '01	Ducibella, Joseph C. '86	Weller, Arthur R. '71	Kalpas, Raymond A. '63
	Tipton, Howell J. '61	Watson Jr., Richard B. '73	Gewartowski, James W. '52	Wilson, Donald R. '64	Lawrence III, Joseph P. '68
	Vehrencamp, John E. '50	Weber, P.E., John W. '53	Koeppe, Eugene C. '77	Zartman, William N. '56	Leasure Jr., William A. '66
	Washburn, Dale F. '57	Benson, P.E., Bernard R. '57	Steinke, Ronald J. '77	Stearns, Richard B. '42	Minnis, David A. '72
	Zarin, Oren '95	Conaty, Gerald F. '56	Dorn, James D. '41	Stradts, Grudis '56	Mitchell, Reginald H. '72
CA Z	Blaney, Timothy J. '86	Dzubay, John R. '79	Harley, Edward T. '69	Stammer, Russell D. '79	Stratmoen, Todd Noel '88
	Cepollina, Frank J. '59	Eggert, Christina '80	Herman, Richard N. '55	Van Horn, David A. '51	Walker, Leiland J. '44
	Masutomi, Daniel K. '87	Gareau, James Peter '93	Puscher, Wilfried A. '74	Winchester, Richard B. '42	Walker, David J. '69
	McGuire, John P. '58	Greene Jr., Joseph F. '53	Rauh, Donald A. '70	Arganbright, Donald J. '42	Braet, Ronald R. '52
	Pham, Alexander H. N. '88	Kane, Martin P. '86	Tempelmeyer, William C. '64	Gurnett, Donald A. '62	Gurnett, Donald A. '62
	Sako, Mitchell E. '90	Kramer, Steven M. '79	Brooks, David '90	Huff, Herbert D. '60	Kehn, Donald M. '44
CA H	Taylor, Patricia Joseph '03	Lizdas, Daniel J. '61	Elo, Joseph '84	Luocke, Gerald W. '70	MDT Dickson, Brian Wayne '93
	Tighe, John R. '82	Perreault, Gregory J. '84	Hoelscher, Joshua David '07	Mitchell, David James '94	Langue, Carl E. '35
	Tracy, Anita Lynne '89	Santoro-Schechter, Leeann '84	Lazorchak, Steven J. '82	Sears, Larry M. '61	Pilger, Brian Lee '93
	Wahl, William F. '82	White, William R. '65	Villasean, James S. '87	Weber, Steven W. '71	MAA Ahern, Michael F. '78
	White, Anthony A. '95	Griffin, Michael Joseph '82	Alexander, John A. '56	Wheeler, Kathleen E. '92	Andel, Robert M. '73
	Dickson, Brian Wayne '93	Bradley, Kevin Patrick '91	Anderson, Donald C. '44	Ashbrook, J. Douglas '66	Aclair, Ph.D., Jared Robert '01
	Langue, Carl E. '35	Halfen, Charles W. '80	Anderson, Kenneth R. '55	Barse, Edwin W. '44	Bassett, Leon H. '51
	Pilger, Brian Lee '93	Neimeyer, Terry F. '77	Arakawa, Wallace J. '57	Briman, Steven D. '77	Brown, Mark W. '82
	Ahern, Michael F. '78	Rae, Kirk A. '88	Argon, Ali S. '52	Carroll, Lee A. '84	Cannon, Lewis S. '82
	Andel, Robert M. '73	Sowiak, Milton M. '57	Atterholt, James W. '57	Gerren, Donna Sue '90	Cocchi, Thomas '85
	Shields, Suzanne L. '83	Tucker, Evelyn M. '79	Ballard, James W. '57	Hayman, Layton W. '59	Engen, George E. '50
	Bassett, Leon H. '51	Williams, Jay J. '71	Banks, William B. '50	Herzmark, P.E., Leonard E. '71	Geelan, Brendan J. '66
	Brown, Mark W. '82	Willing, Walter E. '77	Behr, Susan R. '88	Hinton, Robert A. '61	Griffith, Rebecca '91
	Cannon, Lewis S. '82	Carter, Charles M. '76	Billian, Mark Wayne '93	Hood, John T. '82	Hunter, Nickie '39
	Cocchi, Thomas '85	Hull, Wayne K. '59	Bobeck, Andrew H. '48	Kanaga, William S. '45	Hunter, Michael J. '75
	Engen, George E. '50	Ralek, Charles C. '57	Boher, Richard E. '42	Lichtenauer, Mark G. '79	Jacques, Donald A. '83
	Geelan, Brendan J. '66	Laguarda, Leonard '79	Buck, Robert A. '51	McAneny, Laurence R. '46	Kibbee, Myron T. '93
	Griffith, Rebecca '91	Lintner, William A. '82	Buechler, Ralph M. '69	Peters, Paul E. '57	Linquist, Richard W. '54
	Hunter, Nickie '39	Wilhelm, Eugene B. '86	Burch, Harry C. '69	Robertson, Edward J. '69	Mangiarelli, Christopher A. '96
	Jacques, Donald A. '83	Browell, Edward V. '68	Capasso Jr., Vincent N. '54	Rozich, Frank J. '49	Marceccio, Mario J. '80
	Kibbee, Myron T. '93	Cameron, Edwin W. '44	Carbon, Max W. '43	Sheridan, Hugh C. '59	Meyer, Robert '82
	Linquist, Richard W. '54	Capehart, Barney L. '61	Chambers, W. Craig '68	Sheridan, Margaret A. '96	Proulx, Thomas Joseph '92
	Mangiarelli, Christopher A. '96	Cunha, George E. '50	Cleland, Laurence L. '61	Struble, Philip W. '79	Rotteli, Maryanne L. '88
	Marceccio, Mario J. '80	Geelan, Brendan J. '66	Cronin, Linda S. '91	Vaughan, Charles F. '77	Wye, Roger E. '51
	Meyer, Robert '82	Griffith, Rebecca '91	Cunha, George E. '50	Shields, Suzanne L. '83	AKant, Adnan '72
	Proulx, Thomas Joseph '92	Hunter, Nickie '39	Gerren, Donna Sue '90	Straka, James L. '89	Avery, Donald H. '59
	Rotteli, Maryanne L. '88	Hunter, Michael J. '75	Hayman, Layton W. '59	Drumm, James W. '46	Baxter, Gail D. '74
	Wye, Roger E. '51	Jacques, Donald A. '83	Herzmark, P.E., Leonard E. '71	Darrach III, G. Blaine '65	Boyer, USN Ret. John H. '59
	AKant, Adnan '72	Kibbee, Myron T. '93	Hinton, Robert A. '61	Dillard, James O. '77	Breen, Barry C. '70
	Avery, Donald H. '59	Linquist, Richard W. '54	Hood, John T. '82	Dyer, Richard W. '60	Colavita, M. Mark '81
	Baxter, Gail D. '74	Mangiarelli, Christopher A. '96	Kanaga, William S. '45	Foster III, John L. '74	Dennis, Joseph E. '92
	Boyer, USN Ret. John H. '59	Marceccio, Mario J. '80	Lichtenauer, Mark G. '79	Goff, Joe S. '51	Efnim, P.E., Robert E. '63
	Breen, Barry C. '70	Meyer, Robert '82	McAneny, Laurence R. '46	Golding, David J. '52	Greenspan, Marshall '61
	Colavita, M. Mark '81	Proulx, Thomas Joseph '92	Peters, Paul E. '57	Heintz, Bruce J. '83	Haney, Samuel '46
	Dennis, Joseph E. '92	Rotteli, Maryanne L. '88	Robertson, Edward J. '69	Heitzman, Michael K. '82	Halstead, Robert H. '75
	Efnim, P.E., Robert E. '63	Wye, Roger E. '51	Rozich, Frank J. '49	Hibbard, George L. '65	Honigsberg, Charles A. '52
	Greenspan, Marshall '61	AKant, Adnan '72	Sheridan, Hugh C. '59	Hoernert, Shelly Ann '92	Hui, Anthony V. '00
	Haney, Samuel '46	Avery, Donald H. '59	Sheridan, Margaret A. '96	Houchens, Albert F. '61	Johnson, Timothy L. '68
	Halstead, Robert H. '75	Baxter, Gail D. '74	Struble, Philip W. '79	Houchens, Albert F. '61	Jongbloed, Donald J. '53
	Honigsberg, Charles A. '52	Boyer, USN Ret. John H. '59	Vaughan, Charles F. '77	Jackson, David '51	Kendall, Robert E. '50
	Hui, Anthony V. '00	Breen, Barry C. '70	Shields, Suzanne L. '83	Jebson, Eric R. '80	Lawes, C. Peter '58
	Johnson, Timothy L. '68	Colavita, M. Mark '81	Straka, James L. '89	Kawaguchi, Ray S. '69	Lepines, Atis A. '57
	Jongbloed, Donald J. '53	Dennis, Joseph E. '92	Drumm, James W. '46	Kurze, George P. '56	McCrewe, John D. '51
	Kendall, Robert E. '50	Efnim, P.E., Robert E. '63	Darrach III, G. Blaine '65	Lane, David G. '71	Midway, John H. '47
	Lawes, C. Peter '58	Greenspan, Marshall '61	Dillard, James O. '77	Lin, Jeffrey Eugene '97	Miller, Stephen W. '63
	Lepines, Atis A. '57	Haney, Samuel '46	Dyer, Richard W. '60	Mansmann, Donald J. '82	Mieziva, Matt L. '65
	McCrewe, John D. '51	Halstead, Robert H. '75	Foster III, John L. '74	Matthews, Patricia A. '78	Nichols, Barbara Michelle '94
	Midway, John H. '47	Honigsberg, Charles A. '52	Goff, Joe S. '51	Maurer, Harold E. '50	Niessen, Charles W. '62
	Miller, Stephen W. '63	Hui, Anthony V. '00	Golding, David J. '52	Meyer, David G. '73	Osterberg, Peter M. '78
	Mieziva, Matt L. '65	Johnson, Timothy L. '68	Heintz, Bruce J. '83	Minni Jr., Robert J. '70	Robinson, Thomas C. '58
	Nichols, Barbara Michelle '94	Jongbloed, Donald J. '53	Heitzman, Michael K. '82	Monical, R. Duane '48	Rogers, Peter T. '82
	Niessen, Charles W. '62	Kendall, Robert E. '50	Hibbard, George L. '65	Morgan, Rachel Diane '90	Saba, Robert B. '61
	Osterberg, Peter M. '78	Lawes, C. Peter '58	Hoernert, Shelly Ann '92	Murphy, Thomas F. '70	Shedd, Walter M. '59
	Robinson, Thomas C. '58	Lepines, Atis A. '57	Houchens, Albert F. '61	Newby, Karl E. '82	Shepherd, Stanley W. '70
	Rogers, Peter T. '82	McCrewe, John D. '51	Houchens, Albert F. '61	Newcomb, Robert W. '55	Shields, James D. '72
	Saba, Robert B. '61	Midway, John H. '47	Houchens, Albert F. '61	Park, James E. '57	Smith, Kenneth A. '58
	Shedd, Walter M. '59	Miller, Stephen W. '63	Houchens, Albert F. '61	Pigman, Stuart M. '50	Smith, Thomas L. '67
	Shepherd, Stanley W. '70	Mieziva, Matt L. '65	Houchens, Albert F. '61	Purucker, Joan B. '80	Stark, Robert E. '42
	Shields, James D. '72	Nichols, Barbara Michelle '94	Houchens, Albert F. '61	Reuter III, P.E., James V. '78	Thaler, David Ben '83
	Smith, Kenneth A. '58	Niessen, Charles W. '62	Houchens, Albert F. '61	Twiford Jr., Thomas W. '71	Waagem, Ondria J. '85
	Smith, Thomas L. '67	Osterberg, Peter M. '78	Houchens, Albert F. '61	Ward, John B. '85	Wassberg, Marc S. '70
	Stark, Robert E. '42	Robinson, Thomas C. '58	Houchens, Albert F. '61	Waterman, Joseph R. '52	Wilbourn, David S. '55
	Thaler, David Ben '83	Rogers, Peter T. '82	Houchens, Albert F. '61	Weakly, Thomas L. '55	Wolf, Carl F. W. '53
	Waagem, Ondria J. '85	Saba, Robert B. '61	Houchens, Albert F. '61	Whelan, Robert G. '49	Ziegler, Philip E. '75
	Wassberg, Marc S. '70	Shedd, Walter M. '59	Houchens, Albert F. '61	Williams, Carl L. '49	Abadian, Peter Martin '99
	Wilbourn, David S. '55	Shepherd, Stanley W. '70	Houchens, Albert F. '61	Wisthuff, Scott D. '78	Benedict, Richard Alan '71
	Wolf, Carl F. W. '53	Shields, James D. '72	Houchens, Albert F. '61	Wolfe, Robert J. '62	Blessom, Thomas N. '73
	Ziegler, Philip E. '75	Smith, Kenneth A. '58	Houchens, Albert F. '61	Xu, Xing '70	Cashman, William F. '64
	Abadian, Peter Martin '99	Smith, Thomas L. '67	Houchens, Albert F. '61	Yan, Robert J. '62	Dibeneditto, Joseph P. '71
	Benedict, Richard Alan '71	Stark, Robert E. '42	Houchens, Albert F. '61	Yan, Robert J. '62	Flaherty, Joseph C. '84
	Blessom, Thomas N. '73	Thaler, David Ben '83	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Hablaman, David A. '80
	Cashman, William F. '64	Waagem, Ondria J. '85	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Hamby, Genevieve D. '92
	Dibeneditto, Joseph P. '71	Wassberg, Marc S. '70	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Kurkowski, James F. '84
	Flaherty, Joseph C. '84	Wilbourn, David S. '55	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Onipede, Oladipo '90
	Hablaman, David A. '80	Wolf, Carl F. W. '53	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Rizzone, Angelo J. '53
	Hamby, Genevieve D. '92	Ziegler, Philip E. '75	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Serencha, Mark John '63
	Kurkowski, James F. '84	Abadian, Peter Martin '99	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Stanfield, Robert B. '53
	Onipede, Oladipo '90	Benedict, Richard Alan '71	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Wolfe, Robert J. '62
	Rizzone, Angelo J. '53	Blessom, Thomas N. '73	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Wren Jr., Paul J. '57
	Serencha, Mark John '63	Cashman, William F. '64	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Ellis, Arthur E. '58
	Stanfield, Robert B. '53	Dibeneditto, Joseph P. '71	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Le Rette, William Edward '92
	Wolfe, Robert J. '62	Flaherty, Joseph C. '84	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Los, Paul R. '67
	Wren Jr., Paul J. '57	Hablaman, David A. '80	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Morse, Douglas H. '84
	Ellis, Arthur E. '58	Hamby, Genevieve D. '92	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Murphy, James Patrick '91
	Le Rette, William Edward '92	Kurkowski, James F. '84	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Schoenfeld, Richard Alan '71
	Los, Paul R. '67	Onipede, Oladipo '90	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Soulis, Wilbur T. '72
	Morse, Douglas H. '84	Rizzone, Angelo J. '53	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Swanton, Bruce D. '85
	Murphy, James Patrick '91	Serencha, Mark John '63	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Thompson, John W. '72
	Schoenfeld, Richard Alan '71	Stanfield, Robert B. '53	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Vesce, Paul J. '64
	Soulis, Wilbur T. '72	Wolfe, Robert J. '62	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Young, Charles W. '72
	Swanton, Bruce D. '85	Wren Jr., Paul J. '57	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Anthony III, James W. '65
	Thompson, John W. '72	Ellis, Arthur E. '58	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Bennett, Paul E. '50
	Vesce, Paul J. '64	Le Rette, William Edward '92	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Cooper, Perry A. '62
	Young, Charles W. '72	Los, Paul R. '67	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Cramer, Robert A. '80
	Anthony III, James W. '65	Morse, Douglas H. '84	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Cry, Russell J. '85
	Bennett, Paul E. '50	Murphy, James Patrick '91	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Dzialo, Frederick J. '54
	Cooper, Perry A. '62	Schoenfeld, Richard Alan '71	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Evell, Kenneth A. '88
	Cramer, Robert A. '80	Soulis, Wilbur T. '72	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Kenney, Philip J. '59
	Cry, Russell J. '85	Swanton, Bruce D. '85	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Lynch, David P. '82
	Dzialo, Frederick J. '54	Thompson, John W. '72	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Miller Jr., Melton M. '55
	Evell, Kenneth A. '88	Vesce, Paul J. '64	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Neill, John T. '84
	Kenney, Philip J. '59	Young, Charles W. '72	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Ohnesorge, Thomas E. '59
	Lynch, David P. '82	Anthony III, James W. '65	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Teixeira, Arthur A. '66
	Miller Jr., Melton M. '55	Bennett, Paul E. '50	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Thitney, Paul G. '54
	Neill, John T. '84	Cooper, Perry A. '62	Houchens, Albert F. '61	Zandbergen, Mark E. '77	Zarbo, Richard M. '85
	Ohnesorge, Thomas E. '59	Cramer, Robert A. '80	Houchens, Albert F. '61	Zandbergen, Mark E. '77	
	Teixeira, Arthur A. '66	Cry, Russell J. '85	Houchens, Albert F. '61	Zandbergen, Mark E. '77	
	Thitney, Paul G. '54	Dzialo, Frederick J. '54	Houchens, Albert F. '61	Zandbergen, Mark E. '77	
	Zarbo, Richard M. '85	Evell, Kenneth A. '88	Houchens, Albert F. '61	Zandbergen, Mark E. '77	
		Kenney, Philip J. '59	Houchens, Albert F. '61	Zandbergen, Mark E. '77	
		Lynch, David P. '82	Houchens, Albert F. '61	Zandbergen, Mark E. '77	
		Miller Jr., Melton M. '55	Houchens, Albert F. '61	Zandbergen, Mark E. '77	
		Neill, John T. '84	Houchens, Albert F. '61	Zandbergen, Mark E. '77	

FOUNDER'S CLUB, CONTINUED

MA H	Leung, Xwin B. '87 Magoffin, Michael A. '88	Braskett, Richard G. '58 Burbach, William P. '46 Grill, Susan M. '82 Hess, Charles J. '91 Hess, Craig A. '72 Lucking, Rachel M. '85 Miller, Michael Jay '08 Olson, Gary E. '64 Oss, Donald G. '58 Radermacher, Joseph B. '74 Sandell Jr., Nile R. '70 Smits, Talivaldis I. '59 Travis, Thomas F. '95	Rabin, Daniel E. '73 Richards, John R. '76 Rocca, Jeffrey J. '78 Ross, Robert D. '48 Sharma, Bhavendra P. '69 Szyzsko, Charles J. '63 Thompson, Peter D. '78 Viechnicki, Dennis '62 Bornako, Gregory L. '70 Branco, Maria A. '74 Bryant, Robert W. '70 Budzyn, Ludomir A. '90 Davis, Louise F. '56 De Caprio, Vincent '72 Dittrich, Dennis W. '69 Ebel, Cheryl A. '76 Graber, Eugene A. '66 Gumann, Ronald J. '76 Gupta, M.D., Punit K. '96 Hampel, Daniel '53 Husson III, Matthew A. '66 Jacobson, Peter C. '69 Labos, William J. '73 Lerner, Marshall A. '62 Maslankowski, Edwin C. '66 McVeia III, Albert N. '78 Miller, Elton R. '70 Prewitt, Nathan C. '86 Smith, Harry C. '48 Tinto, P.E., Dennis D. '70	Kieser, Alwin W. '64 Kleinman, Irving '49 Lu, Peter Yong-Zeng '86 Metsch, Stephen D. '68 Metzger, Charles O. '45 Oppenheimer, Robert M. '50 Papoulas, George '48 Prager, Jay M. '68 Schneck, David '49 Shakun, Melvin F. '50 Wolf, Murray '49 Baldwin, Alan R. '70 Berlat, Norman R. '62 Blough, Eric E. '82 Bunker, Wayne A. '82 Campana, Michael Albert '94 Coria, Christine R. '82 Gorski, Gerald E. '82 Harris, Everette C. '76 Mayotte, P.E., Mary F. '78 Quay, Jeffrey R. '85 Randall, Paul William '92 St. Louis, John G. '74 Wells, Eugene F. '50 Ziki, P.E., Ann L. '86	Hazen, Ramon B. '60 Hubbell, Clifton H. '42 Kimmel, Paul R. '69 Larsen, Arthur B. '39 Lund, Jeffrey W. '69 Marcus, Julius L. '60 Martin, Heidi Brumfield '93 Meissner, Robert P. '53 Moonhead, Kenneth W. '50 Seegel, Beryl S. '88 Welch, Charles P. '49 Whitney, Gina M. '80 Wilk, Ralph M. '55
MA I	Villamano, Mark John '75 Walczak, Raymond '74 Arnold, Charles J. '59 Chaffee, Stanley W. '74 Crampton, Lee B. '51 Fike, Jay Edward '96 Hoshaw, Susan J. '86 Leipprandt, Bradley S. '86 Lowry, Peter A. '60 McIntosh, Carl L. '70 Moravek, Michael J. '78 Payne, Lynnette M. '95 Ruth, Gregory P. '86 Siefert, William H. '50 Trecka, William R. '57 Wang, Peggy B. '83 Braem, Murray P. G. '70 Glidden, Harry J. '65 Hodgson, Darel E. '63* Klein, Raymond J. '84 Kuhn, Jonathan L. '92 Leven, Peter Johannes '93 Lindberg, John J. '82 Maki, Steven M. '76 Phillips, Gerald R. '70 Pirkil, John F. '62 Skauge, Borg '63 Smith, John W. '62 Stamm, John A. '61 Weber, Scott C. '88 Whipple, Kristina G. F. '87	Dixon, Charles J. '56 Douglass, Thomas E. '58 Grim, Mark D. '82 McVeia III, Albert N. '78 Miller, Elton R. '70 Prewitt, Nathan C. '86 Smith, Harry C. '48 Tinto, P.E., Dennis D. '70 Simmons, Mary Ann '85 Adams, Charles R. '65 Farrell, Adam John '99 Fink, Earl R. '56 Friemel, Paul R. '66 Garther, Roger W. '63 Gillum, Marvis N. '61 Hibner, Dale V. '74 Linsenhardt, Aldo E. '51 Lorentzen, Robert Eugene '95 Magee, Thomas H. '51 Main, Robert C. '83 Manes Jr., Ezra E. '69 McKiernan, John W. '47 Ott, Ronald J. '71 Phillips, James M. '68 Richmond, Deborah V. K. '70 Rudy, William A. '81 Schmidt, Stacey Lynn '96 Solberg Jr., Melburn Scott '92 Weidinger, Robert P. '61 Wesselhoeft, Adolf J. '71 Agnew Jr., Lewis E. '50 Baer, Ted A. '64 Berkey, Vernon G. '50 Bondurant, David W. '71 Brockhaus, Douglas A. '68 Charles, Albert L. '78 Church, Charles H. '50 Cumper Jr., P.E., James W. '67 Edgington, Antony N. '51 Friedman, Marc Andrew '00 Greco, Mary J. '84 Hord, William E. '59 Kopsky Jr., Raymond J. '84 Kottmann Jr., Richard A. '82 McDaniels, John L. '60 Raney, Edward M. '64 Reidmeyer, Mary C. '78 Roam, John H. '69 Sanderson, Earl D. '50 Saperstein, Lee Waldo '64 Scott Jr., Harry S. '44 Steinman, Rebecca Lee '96 Apanel, Anna M. '80 Bell, Joseph H. '51 Galbierz, Robert W. '64 Lingren, Terry D. '80 Paule, Donald W. '64 Sax, Franklin S. '55 Schlager, Lynn M. '77 Swallow, Louis J. '54 Turley Jr., Clarence M. '50 Williamson, Ronald A. '65 Ausmus, Robert A. '78 Brin, Beth J. '79 Delaney, Robert Charles '88 Egeland, Monte D. '81 Jellison, Gabe Lee '98 Kujawa, Stephan T. '73 Lansberry, John S. '50 Peck Jr., Delbert E. '77 Roberts, Wallace M. '49 Spilde, Eugene N. '55 Erickson, Elizabeth Jeffrey '93 Funston, Bradley '78 Hiers, Robert S. '60 Jackson, Darron B. '86 Montgomery, Wayne '83 Cowling, Edgar C. '75 Ekstrand, James G. '49 Iwan, Russel R. '81 Langford, Susan Kathleen '90 Massey, Craig Allin '96 Moore, Thomas P. '78 Sneed, Kathryn K. '80 Davis, Adrienne Marie '98 Day, Jorgi M. '92 Eriksen, Spencer Lee '99 Goldey, Laurie L. '87 Jones, Keith A. '85 Wittke, Edward W. '99	NJ F NJ B MS A MS B MO A MO B NMI NY A NY B NY C NY D NY E NY F NY G NY H NY I NY J NY K NY L NY M NY N NY O NY P NY Q NY R NY S NY T NY U NY V NY W NY X NY Y NY Z	NY I NY K NY A NY M NY N NY E NY P NY T NY C NY S NY O NY R NY A NY E NY H NY I NY J NY K NY L NY M NY N NY O NY P NY Q NY R NY S NY T NY U NY V NY W NY X NY Y NY Z	OH B OH G OH A OH E OH H OH I OH J OH K OH L OH M OH N OH O OH P OH Q OH R OH S OH T OH U OH V OH W OH X OH Y OH Z
MI A	Dauerer, Walter F. '60 Devere, George J. '54 Falcone, Philip A. '64 Gies, Paul E. '51 Huber, Paul P. '57 Kamelis, Pranciskus S. '69 Kelly, Gary M. '64 Lajeunesse, Robert P. '74 Morton, Joseph P. '73 Nagrant, George Stephen '98 Nolan, James H. '73 Basberg, Douglas S. '69 Billion, Godwin P. '75 Bolgiani, Giovanni '70 Cleary, Gary K. '72 Jerome Jr., George G. '94 Kellar, James S. '60 Klaetke, George H. '55 Paulea, Kenneth S. '78 Paisalis, James M. '47 Pogats, Russel J. '92 Robinson, Jason James '06 Sagert, Harold H. '68 Sieg, Mary H. '77 Yee, Kingman E. '77	MI E MI H MI I MI J MI K MI L MI M MI N MI O MI P MI Q MI R MI S MI T MI U MI V MI W MI X MI Y MI Z	MI E MI H MI I MI J MI K MI L MI M MI N MI O MI P MI Q MI R MI S MI T MI U MI V MI W MI X MI Y MI Z	MI E MI H MI I MI J MI K MI L MI M MI N MI O MI P MI Q MI R MI S MI T MI U MI V MI W MI X MI Y MI Z	MI E MI H MI I MI J MI K MI L MI M MI N MI O MI P MI Q MI R MI S MI T MI U MI V MI W MI X MI Y MI Z

FOUNDER'S CLUB, CONTINUED

	Sheldahl Jr., John O. '57		Pedersen, Neil J. '74	TN A	Packard, Douglas Randall '64	Bonner, Kerry G. '73	Fortune Jr., Horace J. '63
	Wilt, Baldwin N. '74	PA ⊕	Addotta, Robert F. '77		Baldwin, K. Michelle '90	Bunch, John M. '81	Lester, Jason Edward '96
PA A	Young, John R. '46		Bally, Stephen J. '64		Beavers, James Earl '66	Chevalier, Mark Timothy '91	Meith, Robert M. '57
	Alney, Steven D. '74		Barron, William R. '60		Bensen, Joan M. '90	Cox, Ralph P. '54	Powell, James D. '77
	Arrowsmith, Donald L. '65		Capuzzi, Angelo M. '71		Bowden, Bryant B. '68	Crews, James A. '58	Spangler, C. Leigh '82
	Bakis, Charles E. '81		Capuzzi, Lynda A. '71		Davis, Wayne Thomas '73	Davison, James L. '54	Thiel, Stephen W. '81
	Branting, Katrina L. '80		Coppa, Paul L. '59		Duckworth, Holly A. '86	Eng, Ronald W. '71	Thuchak Jr., Charles J. '61
	Brunt, Thomas B. '62		Gianguilio, Arduino N. '73		Exum, Joe H. '52	Foster, Scott A. '84	Trahern, Patti G. '79
	Busch, Kenneth J. '51		Hinkle, John L. '60		Fugatt, Ronald N. '65	Gerlich, Leon H. '54	Viola, Jeffrey P. '78
	Conrad, Joseph D. '53		Latimer, Ph.D. Jose R. '77		Graves, Ronald L. '73	Gibbs, Sara G. '54	VA I Lashomb, Susan M. '83
	Donley, Shawn T. '71		McMahon Jr., William A. '63		Harper, James C. '83	Hartman, Daniel B. '78	VA A Flowers, Daniel F. '40
	Durdock, Robert C. '57		Pearson, Kenneth C. '75		Hill, Robert M. '49	Jordan, Kirk G. '80	Michael, Glenn P. '66
	Edwards, Alfred B. '71		Pela, Karen C. '84		Hodgdon, Richard L. '76	Lippman, Glenn E. '52	Soucek, Leo Eugene '49
	Flaherty, Robert E. '68		Ryan III, Arthur P. '65		Hopkins, John A. '88	McClellan III, W. Roy '74	Wating, Edward T. '49
	Hack, John '50		Shilley, Thomas E. '83		Hutsell, Wilbur R. '68	Meloy, Charles A. '82	WA A Berry, Douglas W. '71
	Johnson, Robert S. '80	PA I	Henry, Martin W. '72		Kerstiens, Stephen J. '82	Miesen Jr., Robert John '87	Brown, David R. '44
	Kendrick, James F. '69		Kane, William P. '61		Lacey III, John W. '69	Plediger III, John E. '74	Coombes, Gregory A. '77
	Langenberg, Fred C. '50		Lorenz, Bryen E. '76		Long, William P. '69	Scott Jr., Charles M. '53	Grant, Patrick W. '75
	MacAdams, Richard J. '46		Martelli, Phil J. '85		Lotts, Adolphus L. '55	Stratton Jr., Jerald J. '86	Melton, Ronald B. '77
	Megerle, William G. '86		Porter, William C. '51		O'Bryan, Lynda K. '62	Vaden III, Frank S. '56	Miller, Steven C. '72
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	Stein, Fred P. '56		Potthoff, Robert E. '56		Rochat, Raymond A. '57	Wornat, Richard O. '49	WAB Bates, James H. '49
	Tomkiel, Stanley A. '72	PA A	Anselm, Gregory A. '81		Rogers, Marvin D. '70	Ford, Samuel '64	Brower, Michael R. '70
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	Bridge, David L. '71		Hays, James C. '73		Ship, Gregory Vincent '93	Ward Jr., Joseph A. '67	Nelson, Sandy H. '49
	Cady, Philip D. '56		Mozelewski, Stephen F. '86		Trivelpiece, Alvin William '53	Crum, Floyd M. '47	Rodeman, Glenn A. '58
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	Fairchild, James W. '81		Caceres, Maria M. '86	TN B	White, Robert S. '48	TX H Clute, Gregory S. '85	WA I Denby, Kenneth M. '82
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	Strickler, Daniel B. '57		Garrett, Scott L. '57		Petersen, Stephanie O. '84	Goolsby, Tommy D. W. '84	WVB Capozzoli, Brent S. '84
	Walker, Kurt M. '77		Rollenhagen, David C. '64		Shireman, John F. '76	Klancher, Michael J. '80	Johnston, Robert S. '71
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	Boiser, William C. '69		Castro, Mark K. '83	TN I	Zabrickis, Kenneth A. '80	TX I Ritchie, Ronald J. '63	Anderson, Kathryn Ann '88
	Capone, Christopher D. '87		Chalson, Michael J. '81	TN G	Barnett, William E. '56	TX K Alexander, Craig Steven '88	Berndt, Martin M. '66
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	Stuever, Robert A. '87	Berry, Michael W. '80	Berry, Michael W. '80	Lipsitt, Harry A. '52	Maier, Dirk E. '87
	Cutler, Verne C. '50	Kottwitz, Donna D. '75	Kottwitz, Donna D. '75	Moerch, Frederick J. '75	Montague, Richard W. '48
	Sprouse, Mary P. '08	Swartz, Stuart E. '59	Swartz, Stuart E. '59	Potvin, Deborah L. '91	Suchyta, Paul Joseph '08*
	Turner, Keith S. '74	Wagner, Don L. '61	Wagner, Don L. '61	Svetlik, J. Frank '67	Thelen, Stanley P. '83
	Wagner, Don L. '61	Calasanz, Leandro E. '77	Calasanz, Leandro E. '77	Vissing, Guy S. '89*	Doherty, Robert J. '73*
	Emrath, Richard W. '75	Forsee, Edward G. '75	Forsee, Edward G. '75	Gosing, Christopher D. '79	Graham, Lawrence C. '59
	Heaberlin, James L. '56	Knight, Arthur H. '65	Knight, Arthur H. '65	Held, Martee S. '85	Holley, Donald L. '53
	Linker, Robert E. '60	Maupin, Joseph T. '47	Maupin, Joseph T. '47	Hudson, Roger '62	Hupf, John C. '83*
	Maupein, Joseph T. '47	Rawe, Richard A. '57*	Rawe, Richard A. '57*	Jamar, John W. '52	Kicinski, Stephen E. '59
	Slade, Susan R. '82	Steilberg Jr., Arthur J. '56	Steilberg Jr., Arthur J. '56	Kiowski, John J. '77	Knoll, Richard H. '57
	Tosti, Beth Lorraine '00	Walker, Roger D. '70	Walker, Roger D. '70	Knuth, Robert L. '51	Kuchta, Samuel W. '48*
	Walker, Roger D. '70	Webster, John R. '57	Webster, John R. '57	Locher, Frederick A. '62	Marcotte, Donald J. '77
	Wells, William L. '62	White, Gary L. '60	White, Gary L. '60	Markwardt, Donald D. '57	McKindles, Gerald T. '50
	Wright, Paul D. '70	Becker, Stanley E. '52	Becker, Stanley E. '52	Meade II, Marvin E. '76	Mullins, Patrick E. '68*
	Carlson, John Richard '04	Dey Jr., Harold L. '56	Dey Jr., Harold L. '56	Nikka, Jeremy David '80*	Oliver, Bruce L. '60*
	Fleischer, Donald M. '79	Gray, John H. '75	Gray, John H. '75	Potoroka, Walter '43	Reynolds, Jack B. '52
	Johnson, Molly E. '81	Koerber, Kenneth L. '57	Koerber, Kenneth L. '57	Rom, David B. '56	Sauer, Daniel Michael '05*
	Kraher Pinto, Marguerite V. '85	Newhall, Chester W. '50	Newhall, Chester W. '50	Sikka, Donald P. '56*	Stone, David G. '70
	Reynolds, Joseph C. '48	Sheehan, Charles J. '52	Sheehan, Charles J. '52	Stundstrom, Raul D. '52	Abelson, Michael F. '82*
	Tockstein, Carl D. '74	Tyler III, Wayne Paul '91	Tyler III, Wayne Paul '91	Asmus, Frederick J. '53	Astrove, Edgar '48
		Yachim, Yetu Aibe '06*	Yachim, Yetu Aibe '06*	Barnowski, Ross Wegner '10*	Bittman, Thomas W. '70
		Cunningham, William T. '44	Cunningham, William T. '44	Bjornlie, Harvey C. '52	Buhler, Douglas C. '80
		Evans, Alfred W. '51	Evans, Alfred W. '51	Clark, Kenn E. '61	Collar, Robert S. '50
		Fowler, James B. '82	Fowler, James B. '82	Dunlap, Roger '56	Fox, Michael T. '79
		Hollier, Joseph K. '79	Hollier, Joseph K. '79	Gottham, Joseph O. '07	Gross, Michael J. '78
		Moreau, Kenneth '85*	Moreau, Kenneth '85*	Harris, Peter V-S '58	Holland, Thomas K. '49
		Morgan, George H. '58	Morgan, George H. '58	Hutchinson, Douglas T. '80	Ipsen, Peter G. '39
		Richard Jr., Francis P. '76*	Richard Jr., Francis P. '76*	Jackson, Richard H. '64	
		Shoemaker, Harry L. '69	Shoemaker, Harry L. '69		
		Blust, Henry L. '50	Blust, Henry L. '50		
		de Quay-Jones, Monique '85	de Quay-Jones, Monique '85		
		Le Blanc, Robert A. '74	Le Blanc, Robert A. '74		
		Ripberger, Richard A. '77	Ripberger, Richard A. '77		
		Snoke, Nancy Meares '02	Snoke, Nancy Meares '02		
		Austin, Steven A. '70	Austin, Steven A. '70		
		Dagette, Megan Elizabeth '07	Dagette, Megan Elizabeth '07		
		Ezell, George D. '60	Ezell, George D. '60		
		Hammons, Robert W. '78	Hammons, Robert W. '78		
		Hulett, Rachel Anne '07	Hulett, Rachel Anne '07		
		Darnell, Stephen Richard '89	Darnell, Stephen Richard '89		
		Day, Anthony F. '65	Day, Anthony F. '65		
		Manoogian, David V. '64	Manoogian, David V. '64		
		Nygaard, Lloyd P. '61	Nygaard, Lloyd P. '61		
		Schick, Michael '61	Schick, Michael '61		
		Serota, Steven '82	Serota, Steven '82		
		Walsh, James Ralph '90	Walsh, James Ralph '90		
		Randazzo, Bert J. '92	Randazzo, Bert J. '92		
		Sebastian, Brett Warren '95	Sebastian, Brett Warren '95		
		Teoh, Chee Boon '88*	Teoh, Chee Boon '88*		
		LA E Diliberto, Marcella Dianne '03	LA E Diliberto, Marcella Dianne '03		
		Berry, Richard N. '37	Berry, Richard N. '37		
		Blaine, William H. '68	Blaine, William H. '68		
		Elwell, John R. '50	Elwell, John R. '50		
		Evenson, Paul R. '85	Evenson, Paul R. '85		
		Gagnon, John R. '62	Gagnon, John R. '62		
		Goodwin, Alice Margaret '00	Goodwin, Alice Margaret '00		
		Hackett, John A. '59	Hackett, John A. '59		
		MacDonald, Joseph D. '68	MacDonald, Joseph D. '68		
		Hoper, John H. '62	Hoper, John H. '62		
		Jantscher, Thomas Alan '09*	Jantscher, Thomas Alan '09*		
		Jochimsen, Ronald D. '72	Jochimsen, Ronald D. '72		
		Norris, David Brian '94	Norris, David Brian '94		
		Okishi, Theodore '60	Okishi, Theodore '60		
		Patrou, John P. '51	Patrou, John P. '51		
		Potter, James W. '45	Potter, James W. '45		
		Rockne, Allan K. '66	Rockne, Allan K. '66		
		Rush, David G. '89	Rush, David G. '89		
		Schult, Eugene D. '49	Schult, Eugene D. '49		
		Sessler Jr., Albert L. '50	Sessler Jr., Albert L. '50		
		Stephenson, Roger V. '78*	Stephenson, Roger V. '78*		
		Kepke, George L. '69	Kepke, George L. '69		
		Upton, Marvell Louise '05	Upton, Marvell Louise '05		
		Wandling, George R. '81	Wandling, George R. '81		
		Weeks, Lawrence M. '43	Weeks, Lawrence M. '43		
		Wheelock, Thomas D. '49	Wheelock, Thomas D. '49		
		Davis, Renee L. '89	Davis, Renee L. '89		
		Dodge, Robert D. '76	Dodge, Robert D. '76		
		Gehl, Jerome J. '73	Gehl, Jerome J. '73		
		Hansen, Ted Leon '98	Hansen, Ted Leon '98		
		Hartsell, Catherine Diane '04	Hartsell, Catherine Diane '04		
		Kinney, Larry L. '64	Kinney, Larry L. '64		
		Lammers, Leon '59	Lammers, Leon '59		
		McSwiggan, Thomas G. '61	McSwiggan, Thomas G. '61		
		Nolsch, Duane A. '47	Nolsch, Duane A. '47		
		Scott, P.E., Richard '61	Scott, P.E., Richard '61		
		Tucker, Lee E. '61*	Tucker, Lee E. '61*		
		Walsh, David L. '58	Walsh, David L. '58		
		AM A Amend, James L. '53	AM A Amend, James L. '53		
		Barr, Deborah A. '81	Barr, Deborah A. '81		
		Booth, Donald N. '73	Booth, Donald N. '73		
		Bowles, Barry J. '79	Bowles, Barry J. '79		
		Bradley, P.E., Richard L. '59	Bradley, P.E., Richard L. '59		
		Christy, Joseph A. '53	Christy, Joseph A. '53		
		Cronmeyer, D.Sc., Donald C. '45	Cronmeyer, D.Sc., Donald C. '45		
		Daver, Fink C. '53	Daver, Fink C. '53		
		Evroski, Ryan Edward '03	Evroski, Ryan Edward '03		

DONORS, CONTINUED

NMB	Buck, Cindy Jo '90	Kaufman, Michael J. '70	Curless, Richard A. '68	Kinsler, Rachel Elizabeth '03	Huber, Joseph F. '68
	Hilland, David H. '83	Raphael, Alan F. '72	Denman, Gary '62	Mau, Norman Lewis '85	Johnson, Daniel E. '65
	Lacatena, Stephen J. '86	Weinstein, Michael R. '85	Fried, Joel R. '71	Michalak, Travis Edward '03	Johnson, Floyd C. '49
NY A	Pineas, Marcia '56	NY A	Ruffett, Leroy '56	Mostash, Kouros '85	Oberholzer, David J. '68*
	Chang, Rodney '10*		Stephan, John E. '47	Van Tassel, James H. '57*	Ott, Timothy R. '86
	Choi, Yeon Sub '07	NY M	Traina, Edward P. '62	Jubin, Eric Michael '95	Pudliner, James D. '76
	Kahn, Mark R. '06		Albertin, Thomas A. '73	OH N	Dresback, Kendra May '99
	Laibowitz, Robert '60		Brier III, Burgess B. '71		Feldman, William J. '38
	Lawson, Derek Michael '09*		Feldman, Brian Pearson '07		Greenberg, Charles M. '66
	Mullery, John '06		Lingane, Patricia James '09*		Hamilton, Robert L. '57*
	Silverman, Burt M. '77		Ludik, Amy E. '96		Marks, Fred M. '88
	Spring, Peter G. '68		Mullek, Garrett R. '62		McLaurin, William T. '63
	Vives, Donald L. '47		Neville, James Maurice '92		Swhiart Jr., John D. '59
NY B	Bernard, Jeffrey L. '49		NY B	OH B	White, Robert Dean '90
	Borst, Kenneth J. '80		Sheahan, P.E., Thomas C. '81		Bostick, Robert Neil '00
	Church Jr., Richard E. '84	NY N	Spring, Deborah Ann '76*	PA Z	Hesse, Tanner Jonathan '10*
	Garofalo, Nicholas R. '51		Dressing, Thomas George '90		McKee, Calvin Charles '48
	Geary, David F. '62*		Dristry, Mark E. '85	OH I	Strawser, Donald E. '71
	Glass, Werner '50		Fligner, Mark '77		Captor, R. Nick '83
	Goetz, Herbert '52		Goldsmith, Robert Holloway '51		Conkle, Harold N. '72
	Hunte, Brian F. '09		Greenzweig, Daniel G. '82		Craig, Dwight R. '79
	Kennedy, Edwin J. '52		Gulliford, Harry J. '52		Crawshaw, James R. '54*
	Kosboth, George '50		Irwin, Christopher Joseph '92		Devore, Dean L. '52
	Leader, Margaret E. '85		Lavitz, Martin S. '78		Dienstberger, Gregory Scott '93
	Olson, John F. '64		Mahlmeister, Mark E. '82		Hayne, James W. '51
	Olson, John F. '64		Markunas, Justin Kenneth '01		Jordan, Sarah Elizabeth '99
	Pooler, David R. '69		Matyjas, John David '98		Keller, Philip S. '84
	Rice, Ann C. '78		McHale, Brian Christopher '02		Kniesly, David R. '61
	Rzepka, William '64		Miller Jr., Donald Bruce '90		Lick, David D. '96
	Shippie, Robert '85		Nguyen, Yen N. '74		Pittman, Leonard D. '68
	Krautz, Bradley J. '58		Notaro, Frank J. '85		Quigg, Joann M. '94
	Thomas, Ph.D., Zachary M. '03*		Roe, Kevin P. '94		Reis, John C. '77
	White, Floyd '42		Sheriff, Jawaad Fuad '05		Rupe, Robert C. '72
NY I	Bernstein, Lawrence '61		Solomonky, Roman '10*	OR B	Fish, William '79
	Blum, Alexander D. '04	NY E	Solomonky, Matthew Ace '05		Harrington, Floyd A. '95
	Burns, Jay R. '41		Sonti, Anthony V. '87		Sutton, Carolyn Ann '88*
	Canavan, Kevin Joseph '92		D'Angelo III, Louis A. '71	OR I	Chaaya, Daoud Salim '01
	Cavett, Robert H. '59		Dowling, Joseph Francis '47*	PA A	Tittle, Neil James '09*
	Chiafalo, Richard Francis '95		Ehler IV, Frederick G. '86		Abbot, James L. '50
	Clifford, James D. '54		Errico, Stephen P. '83		Bachman, Dale F. '56
	Collins, Donald Francis '09		Fichera, Michael Julian '91		Beil, David L. '68
	Fioravanti, Leo Joseph '10*		Kovacs, Charles V. '51	PA H	Boget, Charles E. '82
	Gordon, Edwin F. '50		Lehr, Valentine A. '62		Collura, Adam Benjamin '02
	Hallock Jr., Russell V. '70		McKenna, John Dennis '61	OH A	Cornfield, Julia M. '02*
	Haslett, Robert A. '58		Mohan, Anne Elizabeth '09		Dorkin, Henry L. '70
	Hoffspiegel, Phillip S. '75		Murphy, Susan Cavalea '88		Evon, Joseph '49
	Hosford, Jean Fraser '98		Polise, Anthony T. '71		Hallberg Jr., Edwin '51
	Jennings, Robert E. '63		Radzivila, Raymond '49		Irwin Jr., Richard W. '51
	Kellis Jr., Robert '78	NY O	Spinosa, Frank Robert '66		Iwin H, William J. '63
	Kinsley, Raymond W. '65		Felberbaum, Gary L. '73		Kearney, Edward R. '53
	Lee Jr., George H. '38		Ross, Robert A. '87		Lewanda, David Benjamin '02
	Lewis, Matthew Robert '07*		Weiss, Robert A. '86		Lucadamo, Gene A. '71
	Marchetti, Richard J. '99*	NY II	Boughner, Arnold R. '96		Marjoncu, Daniel '10*
	McAninch, Ian Matthew '02		Chin, Richard '81		Marjony, Richard J. '90*
	Muir, Jennifer Lynn '89*		Langkamp, Richard B. '83		Matukonis, Edward S. '73
	Peltz, Adrienne Nicole '07	NY P	Vandewark, Jason Stewart '93	OH E	McMichael, Francis C. '58
	Petsche, Steven Joseph '07		Ferreira, Antonio Manuel '97		Moore, Robert W. '53
	Pinto, Mark R. '81*	NY T	Casasanta, James Dominic '08		Polyniak, Gregory Joseph '95
	Waters, Anthony John '09*		Chacko, Vinny James '09*		Shah, Minesh Ashok '90
	Widly, George J. '58*		Grivas, William Demetri '97		Stanley, Richard A. '63
	Willigan, Erin M. '82		Jayatilaka, Vikasithe T. '10*		Tedesco, Alan R. '53
	Wilson, Thomas '83		Siu, Susan Shan '01		Vogel, Stephen M. '61
	Wissick, William P. '59		Torres, Peter '02		Von Bergen, Fritz '44
	Ziegler, John Lewis '06	NY Y	NY Y	PA B	Weiss, David S. '65
	Zimmerl, Fred H. '47	NC A	Corcoran, Kermit C. '04		Benson, P.E., Walter '70
NY A	Benedek, Roy '66		Ellington, Barry T. '86		Binford, Jack C. '53
	Chung, William '05		Loos, Robert A. '39		Bodnar, Phyllis M. '81*
	Damouchel, Matthew Paul '08		McCain, Paul R. '89		Burg, Stephen J. '51
	Gent, Peer '61		Meredith Jr., James O. '72		Burley, Brendon Joseph '05
	Harriott, Paul J. '83		Miller, David K. '65		Chatcavage, Edward F. '80
	Kaliski, Michele A. Fichtl '85		Noble, Robert T. '69	OH Z	Coates, Sheri Anne '94
	Kan, Darren Franklin '02		Norville, John A. '58		Coyne Jr., Harold J. '63
	Kogan, Joseph S. '56		Pitts Jr., Robert J. '87		Edge, Brian A. '07
	Lax, Jeffrey P. '83		Poindexter, Richard C. '64		Graham, Arthur H. '68
	Malarkey, Jonathan '91		Schermerhorn, Donald F. '61	OH H	Graham, Paul W. '61
	Newhard, P.E., Jack E. '52		Skipper, Lee Roy '82		Griffin, Andrew Jonathan '99
	Ries, Alvin W. '51	NC I +	Alperin, Alfred M. '44		Groff, Richard Eugene '96
	Sawchuk, John A. '71		Chau, Felix Yan-Fay '96*		Handshue, James Davd '03
	Shi, Julia M. '83*		Exnicios, Andrew Smith '01		Harper, Kenneth L. '74
	Whills III, William T. '66		Hamada, Donald M. '71		Harvey, P.E., John William '95
	Woronowicz, Michael S. '85		Hatley, Marvin Thomas '43		Hemler, Robert J. '70
NY E	Brolin, Stephen J. '57		Lemel, Page Ives '84		Hofmoeckel, Kevin A. '85
	De Santo, Daniel F. '52		Rawley, Curt A. '71		Hogan, William Oliver '95
	Einson, Stephen E. '59		Russell Jr., Parvin M. '57		Joseph, Robert A. '75
	Hauptman, Marvin H. '59		Smith, Philip C. '60*		Kempf, Dwight C. '81
	Kanchanagom, Dana '67	NC A	Cochrane, Eric R. '78*		Keperling, Kyle Brandon '05
	Lemp, Ronald A. '71		Deese, Rickey J. '75		Kessler, John R. '47
	Reber, Raymond A. '63		Holshouser, Thomas E. '86		Klingemmer, Roger L. '57
	Schentes, Martin J. '49		Porter, Joseph S. '79*		Livingston, Jason S. '00
	Stephan, Brian G. '62		Tennent, Anthony D. '79		Mathieu, Richard D. '52
	Wilson Jr., Ernest G. '66		Wirth, Thomas R. '87*		McCully, Shannon Aileen '96
NY Z	Dileo, Daniel A. '69	NC E	Hershlag, Christopher Emil '96		McNair Jr., Irving M. '54
	Kagan, Herman '51	ND A	Boltinger, Lester N. '55		Whitney, Lynn Duane '08
	Katz, Mordecai D. '52		Child, Gordon B. '55		Wilson, Jeffery Alan '88
	Keating, Kenneth B. '53		Eng, Leonard A. '58		Winningham, Bryan W. '07*
	Krieger, Martin A. '69		Erickson, Theodore D. '53*		Young, Frank Charles D. '92*
	Levine, Howard S. '63		Heltemes, Robert B. '52	OH E	Ziegler, Dustin Phillip '97
	Badalamenti, Salvatore '75		Herther, Terry D. '60		Baylog, John G. '75
	Chakraborty, Sanjay '88		Hirning, James L. '88		Hartings, James W. '71
	Demarinis, Bernard D. '68		Horlacher Jr., Alfred E. '75		Jaltes, Julia Lynne '09*
	Fautale, Charles '63		Huss, Frederic L. '70		Kamm, Irmin O. '54
	Levin, Stanley H. '47		Kallis, Adrian G. '88		Marks, Steven J. '85
	Marcoux, H-Paul J. '47		King, Robert D. '63		Rose, Thomas J. '55
	McClean, Jomo L. '92		Lopez, Angel '65		Strader, Alan L. '85
	Osion, Arthur '52		Mack, Thomas W. '57	OH I	Unverferth, R. Steven '74
	Palazzo, Cosimo J. '60		Nyhus, Orville K. '63		Bennett, Theodore Ashley '01
	Rossolimo, Ph.D., Alexander '62		Palmer, William A. '65		Drouhard, Todd Anthony '98
	Sandler, Stanley L. '62		Sauber, James G. '58	PA I	Geyer, Allan E. '74
	Shinners, Stanley M. '54		Seppanen, John L. '91		Homan, Gregg G. '86
	Sonky, Sidney N. '58		Stetten, Harold L. '48		Hurtig, Juliet H. '91
	Sosinsky, Emanuel '59		Waack, David A. '83		Hurtig, Michael Lee '91
	Wong, Keith K. '79	ND B	Luoma, Daniel Joseph '10*		Johnston, Lorraine Laura '08
	Adair, James L. '83		Shortland, Robert Kloster '57		Liesner, Kevin R. '84
	Conklin, George M. '47	OH A	Bogolin, Ronald R. '56		Low, Robert Lindsey '03
	Dodd, Christopher W. '89		Contenza, Michael D. '78	PA A	May, Ariette Petersen '05
	Godlove, Katie Ann '02		Ehler, Donald A. '84		Redic, Merritt Dean '59
	Hartatos, Fred N. '70		Friedelsky, Phillip J. '66		Robland, Benjamin Charles '06
	Jacobs, Denise A. '73		Gomez, Ramon A. '81		Rowan, Sarah Helen '02
	Jaquish, Frederick J. '81		Heestrand, Glenn M. '64		Ward, P.E., Robert Lee '88
	Jerabeck, Valerie B. '76		Hilberman, Dan '63*		Webb Jr., John A. '68
	Saviz, Camilla M. '87		Koch, Carl C. '59	OH K	Wimer, Mark Robert '02
	Timm, Richard L. '76		Kuhlman, William D. '38		Fritz, John Michael '94*
	Watson, Richard P. '78*		Lesco, Daniel J. '62		Matar, Ashraf Ali '02*
	Brand, Alfred H. '56		Marshall, James L. '56		McCarthy, Stephen Joseph '07*
	Capuzzi, A. Michael '01		Martens, John D. '93		Pritchard, Minnie L. '55
	Klinger, Allen '57		Molitors, Robert W. '77	OH A	Schneider, Ronald E. '75
	Salcedo, Frederick J. '62		Roth, Robert A. '42		Schwendeman, John L. '88*
	Savatta, M.D., Domenico J. '93		Schurr, Charles A. '43		Bindel, Christopher E. '84
	Schulman, Richardson Jr., Joseph C. '51		Trizadel, Norman T. '60		Dannessa, Dominic A. '78
	Simms, Richard '59		Westenbarger, Glen R. '48		Martauz, Frank D. '84
	Stern-Berkowitz, Janet '81	OH B	Yonovitz, Robert '48		Novak, Michael Richard '96
	Sullivan, Roger K. '63		Anderson, Jeffrey A. '76	PA E	Reedy, Patrick J. '84
	Uhl, P.E., Wilfred O. '49		Boldman, Donald R. '58		Adelman, Michael James '10*
	Wilkowski, Stephen J. '80		Chalk, David L. '62		Baldoni Jr., Eugene '49
NY K	Footo Jr., James C. '60				Bogden, Kenneth M. '69
					Colbourne, Richard J. '78
					Drosdick, Joseph W. '55
					Frabizzio, Michael Anthony '96
					Gehman, Philip A. '56*

DONORS, CONTINUED

Hansen, Kyle Ernest '10*	Goldsmith, Clifford R. '52	Rigney, Christopher Robert '97	Gritton, Charles W. K. '76	WAA	Dacuquisto, John Fred '65
Hungerford, Kurt Ronald '03	Harrison, Steven Manley '97	Rothermel, Jeffrey Todd '94	Hoover, Carl David '97*	WVA	Kuder, Katherine Gem '00
Karjalainen, Brett Lee '89*	Irick, John T. '59	Sherrill, Guy J. '64	Kennedy, Michael F. '72		Frederick, Timothy S. '93
Keller, Debra S. '86	Johnson, Mark E. '78	Szymczak, Edward J. '61	Kolovich, Paul Kevin '10*		Halabe, P.E., Udaya Bhattacha '84*
Kerk, P.E., Carter J. '81	Laucius, Regina M. '80	Terrill, Wayne H. '49*	Loucks, USN Ret, Steven J. '64		Johnston, John W. '73
Maxwell, Steven Joseph '91*	McCarty, Frederick B. '49*	Tipton, Dewey R. '64	Meade, John Garvey '95		Jones, Burl W. '73
Mead, S. Edward '62	Mills, Denver L. '57	Trotter Jr., Ide P. '54	Myers, Griffin Kyle '00*		La Count, Terri D. '82
Mosier, Donald E. '78	Moguel, Walter L. '33	Wilson Jr., Carl W. '54	Olson, Nicholas Stefan '10*		Means, Kenneth Harvey '63
Paullin, P.E., Robert Lewis '50	Musler, Jeffrey Lynn '90	Zama, Robert M. '54	Pilipowskyj, Serhij '59		Palmer, Charles B. '69
Pirner, Steven Mark '72	Poor, Noreen Dell '84	Bonilla, Vicente A. '98	Romano, Cynthia Ross '87		Shuck, Lowell Z. '58
Stechmann, Eric Lee '70	Reynolds, A-Lan V. '91	Doekal, Ronald J. '73	Schell, Amy Elizabeth '08		Webb, Gary E. '70
Wilson, Seth Ernest '50*	Seaman, George C. '66	Nieto, Shayler '63*	Wallenborn, R. Wheat '55		Williams, Linda I. '84
SD B	Shields, P.E., David Ray '00	Parnely, Marjorie A. '75	Wiederholt, Cynthia X. '79		WVB
Bienfang, Cory Lane '09*	Smith Jr., Horace V. '94	Acosta, Ritchie Anthony '10*	Yao, Yao '10*		Lorkowski, Timothy W. '33
Brost, Bart D. '97	Tapley, Byron D. '56	Broussard, Lance Armanee '97			Parker, Dennis A. '75
Konda, Travis Frank '98	Vaverek, Gavin N. '81	Mars Jr., James F. '72	VA B	Artson, Stephen G. '64	Tilow, P.E., Brian E. '97
Oster, Zachary James '07	Von Rosenberg, Charles E. '51	McCabe, Glen H. '82	Bennett, James P. '60	Becker, James Carlin '74	Walters, Robert L. '82
Petersen, Laura B. '86	Wachel, Johnny C. '59	Oswald, T. Tristan '09	Fletcher, Ronald E. '69	Wiggins, Daniel I. '77	WI A
Petrik, Gregory D. '84	West, James M. '49*	Acker, Donald E. '74	Frieman, Robert P. '61	Anderson Jr., George J. '48	Buss, Jerrold L. '57
Quist, William A. '84	White, William T. '51	Cruise, Elmer C. '62	Howell, Paul Vernon '89	Cafferty, Basil L. '52	Carroll, Richard D. '71
TN A	Wilson, Arthur E. '60	Davet, Jean-Paul Robert '08	Jackson, Ray A. '50	Geisz, Eugene W. '60	Carroll, Richard D. '71
Bryan, Catherine B. '84	Anderson, Roger K. '65	Foster, Jerry C. '70	Koelling, Henry R. '65	Gorowsky, Blake Comstock '07	Geulzer, Marshall F. '61
Byram, Gregory Joseph '90	Crowder III, Lewis F. '59*	Hemmi, Christian O. '62	Martin Jr., John W. '42*	Hand, Paul R. '54	Hand, Paul R. '54
Cofar Jr., Joseph '63	Easter, Billy H. '51	Moore, David '71	Obrien Jr., Walter F. '60	Janda, Amber Leigh '06	Legault, Kathryn A. '85
Coppedge, John F. '52	George, P.E., William K. '99	Morris, Thomas Joseph '96	Parrish, Harold E. '56	Legault, Kathryn A. '85	Nesbitt, John D. '82
Dickerson, Will K. '56	Hartman, Donald E. '65	Pullman, David '94	Parsons, Jerome S. '66	Legault, Kathryn A. '85	Nesbitt, John D. '82
Dobrodziej, Kristin Lynn '08	Koepf, Lloyd A. '53*	Brown, Michael L. '82	Pilgrim, Kurt A. '83	Legault, Kathryn A. '85	Nesbitt, John D. '82
Farnham, Robert M. '47	Krieger Jr., Benny Jack '99	Charonch, Dares '98	Ricketts, Garland B. '66	Legault, Kathryn A. '85	Nesbitt, John D. '82
Froula, Alan M. '87	Lowder, Jack T. '79	Fox, David S. '80*	Saucke, Debra C. '81	Legault, Kathryn A. '85	Nesbitt, John D. '82
Garrison, Arlene Allen '88	Lynes, Gracie Arlene '04	Haktant, Servet A. '76	Shaffer, James A. '49	Legault, Kathryn A. '85	Nesbitt, John D. '82
Godsey, A. Roy '43	McMillan, P.E., Robert L. '74	Maldonado, Jerry '88	Snavey, Charles G. '78	Legault, Kathryn A. '85	Nesbitt, John D. '82
Hallmark, Thomas M. '58*	Milam, Michael F. '78	Stobart Jr., John A. '02	Sockell, Edward J. '78	Legault, Kathryn A. '85	Nesbitt, John D. '82
Harris, Lauren Lindsey '05	Moore, Clarence A. '54*	Ybanez, Robert E. '71*	Spangler, Edward G. '79	Legault, Kathryn A. '85	Nesbitt, John D. '82
Hurt, William W. '58	Owen, P.E., Roger K. '48	Lewis, Gloria C. '96	Sproles, David A. '77	Legault, Kathryn A. '85	Nesbitt, John D. '82
Irwin, S. Ronald '64	Reinking, Greg F. '84	Patel, P.E., Nita K. '95	Tipton Jr., Thomas E. '67	Legault, Kathryn A. '85	Nesbitt, John D. '82
Jackson, Robert H. '59	Talati, Deepak A. '84	Folorunso, Olatunji Vanessa '08*	Ammentorp, Jennifer Lynn '08*	Legault, Kathryn A. '85	Nesbitt, John D. '82
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Lambert, William Mark '91	Droste, Carl S. '61*	Savoy, Demond Britt '96	Harris, Arlene Whitson '92	Legault, Kathryn A. '85	Nesbitt, John D. '82
Lowe, Robert A. '70	Gillette, Robert D. '69	Sowell, Dale A. '76	Hunt, Robert E. '97	Legault, Kathryn A. '85	Nesbitt, John D. '82
Lusted, Scott Alan '04	Horowitz, Michael E. '57	Walker, Alma Louise Echols '93	Pronko, Mark S. '81	Legault, Kathryn A. '85	Nesbitt, John D. '82
McCoy, Herbert E. '57	Johnson, Colleen Bea '90	Williams, Donald Craig '89	Srodulski, Barbara W. '82	Legault, Kathryn A. '85	Nesbitt, John D. '82
Monday, Robert E. '80	Kane, George V. '48*	Chapman, Christopher L. '04	Mullen Jr., W. Grigg '76	Legault, Kathryn A. '85	Nesbitt, John D. '82
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Rochat, Vernon E. '58	McCarty Jr., Fred C. '72	Carway, C. Wayne '58	Ross III, John J. '51	Legault, Kathryn A. '85	Nesbitt, John D. '82
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Southall, Katherine Williams '84	Scheffel, Mark R. '78	Vera, Johnny Joe '99	Laako, Melvin T. '70	Legault, Kathryn A. '85	Nesbitt, John D. '82
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Vitteoe, Linda Ray '86	Beal, Patrick V. '88	Heninger, Suzanne T. '86	Olson, Stephen A. F. '82	Legault, Kathryn A. '85	Nesbitt, John D. '82
Whitley, Grover C. '59	Breffelth, Katherine Renee '09	Kelley, Brenton Collier '89	Perrault, William R. '59	Legault, Kathryn A. '85	Nesbitt, John D. '82
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Wunderlich, P.E., Walter O. '56	Casco, Andres Enrique '99	Pearson, David R. '65	Splinter, August M. '42	Legault, Kathryn A. '85	Nesbitt, John D. '82
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Adams, Jr. A. '63	Hall, Robert A. '63	Boulter, Robert E. '62*	Zoeller, Gregory J. '68	Legault, Kathryn A. '85	Nesbitt, John D. '82
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Clevenger, Jerry A. '65	Johnson, Max Edward '97	Davis, James Kumen '03	Krstic, Slobodan '79	Legault, Kathryn A. '85	Nesbitt, John D. '82
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Ross, Anthony D. '72	McClung, David A. '73	Bruneel, Frank Weston '90	Baneck Jr., James E. '06	Legault, Kathryn A. '85	Nesbitt, John D. '82
Schulz, Frederick E. '78	McCutchen, Maureen Kuzik '84	Espin, Robert Barton '04	Barnes, Matthew John '01	Legault, Kathryn A. '85	Nesbitt, John D. '82
Wilson, Christopher D. '85	McFaul, Julie Elizabeth '97	Aldrich, P.E., Bradley F. '81	Hill, Howard Dean '94	Legault, Kathryn A. '85	Nesbitt, John D. '82
TN A	McIver, Jes D. '51	Bouchard, Donald R. '81	Ogden, Deborah Kay '92	Legault, Kathryn A. '85	Nesbitt, John D. '82
Klein, Sally Anne '89	McMullan, Charles D. '58	Gardner-Morse, Mack G. '82*	Prescher, Matthew John '04	Legault, Kathryn A. '85	Nesbitt, John D. '82
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Rowland, Laura '84	Mundkowsky, William F. '58	White, Janine L. '03	Holte, Jennifer E. '90	Legault, Kathryn A. '85	Nesbitt, John D. '82
TN Z	Murray, James R. '82	Komoni, Krenar '06	Holte, Jennifer E. '90	Legault, Kathryn A. '85	Nesbitt, John D. '82
Barnhardt, David Marshall '00	Oliver, Howard R. '49	Van Domelein, John F. '64	Holte, Jennifer E. '90	Legault, Kathryn A. '85	Nesbitt, John D. '82
Keck, Christopher C. '95	Osborn, Oliver '38	Abraham, Ryan Thomas '09	Holte, Jennifer E. '90	Legault, Kathryn A. '85	Nesbitt, John D. '82
McGlumphy, Jonathan David '02	Pardue, Lon H. '63	Barker Jr., R. Edward '52	Holte, Jennifer E. '90	Legault, Kathryn A. '85	Nesbitt, John D. '82
Allianon, Artemis '08	Pechacek, Ronald D. '78	Firey, Jeanne S. '81	Holte, Jennifer E. '90	Legault, Kathryn A. '85	Nesbitt, John D. '82
Boyle, Bruce W. '79	Perez, Jason '91	Griffin Jr., Joseph H. '71	Holte, Jennifer E. '90	Legault, Kathryn A. '85	Nesbitt, John D. '82
Chen, Annie Y. '89	Perkins, Thomas K. '52	Griffin Jr., Joseph H. '71	Holte, Jennifer E. '90	Legault, Kathryn A. '85	Nesbitt, John D. '82
Ehlers, Clarence J. '66		Griffin Jr., Joseph H. '71	Holte, Jennifer E. '90	Legault, Kathryn A. '85	Nesbitt, John D. '82
Glavan, John R. '88		Griffin Jr., Joseph H. '71	Holte, Jennifer E. '90	Legault, Kathryn A. '85	Nesbitt, John D. '82

TBII Directory
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- Vice President Solange C. Dao, P.E., FL A '95, 1110 E. Marks Street, Orlando, FL 32803** solange@tbp.org
- Councillor Jonathan F.K. Earle, Ph.D., P.E., FL A '65, 8516 SW 20th Lane, Gainesville, FL 32607** jonathan@tbp.org
- Councillor Jason A. Huggins, P.E., FL A '96, 4701 Hickory Shores Blvd., Gulf Breeze, FL 32563** jason@tbp.org
- Councillor Norman Pih, TN A '82, 811 W. Cherry Ave., Flagstaff, AZ 86004** norman@tbp.org

INTERNATIONAL HEADQUARTERS

- Executive Director Curtis D. Gomulinski, MI E '01,** P.O. Box 2697, Knoxville, TN 37901-2697 curt@tbp.org
- Executive Director Emeritus James D. Froula, TN A '67,** P.O. Box 2697, Knoxville, TN 37901-2697 jim@tbp.org
- Asst. Sec.-Treas. Roger E. Hawks, NY A '75, P.O. Box 2697,** Knoxville, TN 37901-2697 roger@tbp.org
- Telephone: 865/546-4578 tbp@tbp.org
- Fax: 865/546-4579 www.tbp.org

TAU BETA PI
PLANNED GIVING

Tau Beta Pi's 26-page guide to planned-giving opportunities shows how your support can benefit both TBII and your personal financial situation.

Topics include:

- Gifts of cash, stock, real estate, and life insurance,
- Charitable remainder trusts, and
- Charitable lead trusts.

To request a copy, email: GivingBooklet@tbp.org or write: Tau Beta Pi, P.O. Box 2697, Knoxville, TN 37901-2697



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The following 228 companies and foundations match gifts made by their employees to Tau Beta Pi. Their support is gratefully acknowledged by the Association. All matching gifts are allocated to the Tau Beta Pi Fellowship and Scholarship Programs to provide stipends for engineering undergraduate and graduate students. We welcome five new firms ().*

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IN THE COLLEGES

SPOTLIGHT

Graduate Enrollment Down

The Council of Graduate Schools reports that enrollment of new students at U.S. graduate schools fell 1.1 percent from 2009 to 2010, compared to a 5.5 percent increase the previous year. This marks the first decrease since fall 2003 and occurred despite an 8.4 percent increase in applications. Total graduate enrollment grew 1.1 percent.

Differences were seen in first-time enrollment of domestic students (down 1.2 percent) versus international students (up 4.7 percent after a decline last year). This is contrary to trends over the past decade when the average annual rate of increase for U.S. citizens and permanent residents was 4.4 percent vs. 2.3 percent for international students.

A 4.9 percent gain in first-time enrollment for Hispanics/Latinos between 2009 and 2010 was countered by declines for American Indians/Alaskan natives (-20.6 percent), blacks (-8.4 percent), whites (-0.6 percent), and Asians/Pacific islanders (-0.1 percent).

STEM Boost Plea

The chancellor of Florida's state university system wants reforms that would increase degree completion, boost the number of STEM students, and reevaluate how faculty are compensated and tenured.

Chancellor Frank Brogan presented the ideas at a meeting of the governors, saying that high on his list is bringing more students into STEM fields, which are expected to see continued growth in the years ahead. Of all Florida bachelor degrees awarded in the 2008-09 school year, 13.8 percent were in STEM subjects, placing the state 11th nationwide.

The state university system's \$3.98 billion legislative budget request—up 14.5 percent—includes \$150 million for STEM education and increasing the number of students earning four-year degrees.

Skills Shortage Call

The United States needs to allow more visas to help the economy and should let highly skilled engineers who study in U.S. universities stay in the country, said New York Mayor **Michael R. Bloomberg**, *Maryland Alpha '64*.

"Turning these students out of the country is, to put it bluntly, about the dumbest thing that we could possibly do," Bloomberg said in a speech to the U.S. Chamber of Commerce and the Partnership for a New American Economy.

First, Bloomberg said, the U.S. must expand the number of green cards available to the best high-skilled workers. Second, should be an easy, clear path for foreign students earning advanced U.S. degrees to obtain green cards. Third, would be a visa program for entrepreneurs who have the capital to back their business plans, giving legal status to those whose businesses grow and create jobs. Fourth, would be to attract talented workers proactively.

Computer Testing Move

The member licensing boards of NCEES have approved a new pricing model for exams that will go into effect when the fundamentals of engineering and fundamentals of surveying exams shift to computer-based testing in January 2014.

The new model, which features an all-inclusive fee for the FE and FS that covers the exam itself and administration costs, was a key step in the transition from paper-and-pencil to computer-based testing.

The final paper administration of the exams, which are taken by nearly 50,000 examinees throughout the U.S. and in several foreign locations each year, will occur in October 2013.

New York Campus Bids In

The bids are in for universities to open a new engineering school in New York City with the help of the Bloomberg administration.

The competition has drawn wide interest from institutions like Stanford, Cornell, Columbia, and NYU. They and other universities are bidding for the right to open a campus for technology and applied science. In

exchange for a commitment to build or expand a world-class science and engineering campus, the city is offering free real estate—either at Governors Island, Navy Yard, or Roosevelt Island—and up to \$100 million in infrastructure upgrades.

Stanford announced a partnership with City College of New York. The school said it would spend \$2.5 billion over 20 years on the project. Cornell announced a partnership with the Technion-Israel Institute of Technology to create the new campus.

Schools have hired lobbyists and mobilized alumni to talk up their plans. The new campus could open as early as 2013. The Bloomberg administration reports that it will pick a winner by early January.

PEOPLE

Dr. Ronald L. Adams, *Oregon Alpha '70*, who has been dean of Oregon



State University's college of engineering since 1998, is becoming the university's first executive associate vice president for research. Before coming to OSU, he

was a vice president for Tektronix. Dr. Adams has forged strong relations with the new technology sector in Oregon, and he will seek to build links with other areas in the private sector.

Laura M. Barito, *New Jersey Alpha '11*, was named the 2011 NCAA



woman of the year. She was already a 22-time All-American in swimming and track, and two-time NCAA national champion. Barito is currently in graduate school

at the University of Delaware, pursuing a Ph.D. in mechanical engineering and bio-mechanics. She is working on projects that involve the knees, including replacements and implants. She has also been training for the U.S. swimming nationals. In

Katherine E. Niehaus, *California Gamma '10*, is receiving a 2012 Rhodes scholarship to study at the University of Oxford. She earned her B.S. in biomechanical engineering in 2010 and an M.S. in 2011. Her class and research work focus on biomechanics, and her interests lie in its applications to technology entrepreneurship. TBP Fife Fellow No. 137, Kate also captained Stanford's varsity track and cross-country teams, won the Pac-10 5,000 meters, and won academic-all American honors.

Presidential Awards

President Obama named eight Tau Bates among 94 recipients of the presidential early-career awards for scientists and engineers. This is the highest honor bestowed by the federal government on technical professionals in the early stages of their independent research careers.

- **Dr. Katherine E. Aidala**, *CT A '01*, Mount Holyoke College.
- **Dr. Michael S. Arnold**, *IL A '01*, University of Wisconsin–Madison.
- **Dr. Noah J. Cowan**, *OH I '95*, Johns Hopkins University.
- **Dr. Michael J. Escuti**, *PA Z '97*, North Carolina State University.
- **Dr. Stephen M. Spottswood**, *NH A '95*, U.S. Air Force Research Laboratory.
- **Dr. Andre D. Taylor**, *MI I '04*, Yale University.
- **Dr. Kartik A. Srinivasan**, *CA B '00*, National Institute of Standards and Technology.
- **Dr. Samuel L. Zelinka**, *WI A '05*, U.S. Forest Service.

Young Faculty Awards

The Defense Advanced Research Projects Agency honored nine Tau Bates in the 2011 DARPA young faculty award program. The awards identify and engage rising research stars at U.S. academic institutions and expose them to Department of Defense needs as well as DARPA's program development process.

- **Dr. Mark A. Foster**, *NY A '03*, Johns Hopkins University.
- **Dr. Michael C. Jewett**, *CA E '99*, Northwestern University.
- **Dr. Minjoo L. Lee**, *RI A '98*, Yale University.

- **Dr. Robert M. Rioux Jr.**, *MA A '99*, Pennsylvania State University.
- **Dr. Raymond C. Rumpf**, *FL Z '95*, University of Texas at El Paso.
- **Dr. Mark P.-W. Styczynski**, *IN I '02*, Georgia Institute of Technology.
- **Dr. Zeeshan H. Syed**, *MA B '03*, University of Michigan.
- **Dr. Yayoi Takamura**, *NY A '98*, University of California, Davis
- **Dr. Edo Waks**, *MD A '95*, University of Maryland.

FACILITIES

Carnegie Mellon University researchers are to work with Intel Corporation scientists to shape the future of embedded and cloud computing after the announcement of a \$30 million, five-year commitment from the chip maker. This will fund two Intel science and technology centers at the school. The centers represent the next installment of the firm's recently announced five-year, \$100 million ISTC program to increase university research and accelerate innovation in key areas. As with previously announced centers for visual computing and secure computing, the new centers encourage tighter collaboration between university thought leaders and the firm. To encourage further collaboration, the centers use open IP models with results publicly available through technical publications and open-source software releases.

The University of South Florida has received its largest in-kind donation—\$25.9 million in software for electrical engineering students. The gift from Agilent Technologies will be helpful for electrical engineers working with wireless technology—about 200 juniors and seniors and 200 graduate students—but the school will make it available to all engineering students to give them an edge in the job market. **Dr. John M. Wiencek**, *OH B '84*, dean of engineering, stated: "They can hit the ground running and start a job, and be able to move right into the core of engineering, rather than spending time training and learning the software."

Dow Chemical will increase its investment in traditional engineering education by providing \$25 million per year to 11 university partners during the next 10 years, reports *IndustryWeek*. The firm "is concerned that during the past 20 years chemical engineering departments in the U.S. are moving toward biotechnology, rather than the traditional engineering disciplines and skills." The following schools will benefit from the investment: **California Institute of Technology; University of California, Santa Barbara; University of California, Berkeley; Carnegie Mellon University; Georgia Institute of Technology; University of Illinois at Urbana-Champaign; University of Michigan; University of Minnesota; Northwestern University; Pennsylvania State University;** and the **University of Wisconsin**.

The University of Tennessee, Knoxville, will be at the forefront of research, education, and technology for sustainable energy systems with a five-year, \$18 million award from the National Science Foundation and the U.S. Department of Energy. This is the first time UT has been chosen to lead an NSF engineering research center, and the school will play a central role in President Obama's goal to overhaul the nation's power grid. The new center, called CURENT (center for ultra-wide-area resilient electric energy transmission networks), involves a consortium of academia, industrial firms, and national laboratories. **Dr. Kevin L. Tomsovic**, *MI B '82*, head of the electrical engineering and computer science department, will direct the center.

The University of California, Santa Cruz, has launched a major in robotics engineering that combines electrical, computer, and mechanical engineering. Leading to a B.S. degree, the major is the first of its kind in the UC system. The department of computer engineering will administer the program. Students began enrolling in the major in fall 2011. The degree will prepare them for careers including robotics, biotechnology, computer hardware, and instrumentation.



Brain Ticklers

RESULTS FROM SUMMER 2011

Perfect

Brule, John D.	MI B '49
Couillard, J. Gregory	IL A '89
Gerken, Gary M.	CA H '11
Rasbold, J. Charles	OH A '83
Spong, Robert N.	UT A '58
*Thaller, David B.	MA B '93

Other

Aron, Gert	IA B '58
Beaudet, Paul R.	Father of member
Bertrand, Richard M.	WI B '73
Conway, David B.	TX I '79
Davis, John H.	OH I '60
Dror-Rein, Elana	CA E '83
Rein, Edan	Son of member
Jones, Donlan F.	CA Z '52
Jones, Robert F.	Son of member
Jones, Michael P.	Son of member
Jones, John F.	WI A '59
Jones, Jeffery C.	Son of member
Kimsey, David B.	AL A '71
Lalinsky, Mark A.	MI I '77
Mitchell, Teri L.	AL A '85
Mitchell, Steven D.	AL A '12
Prince, Lawrence R.	CT B '91
Rentz, Peter E.	IN A '55
Schmidt, V. Hugo	WA B '51
Shah, Parth	Son of member
Stribling, Jeffrey R.	CA A '92
Strong, Michael D.	PA A '84
Tsiatis, Anastasius A.	Husband of member
Voellinger, Edward J.	Non-member
Zwillenberg, Melvin L.	NY I '60

* Denotes correct bonus solution

SUMMER REVIEW

Of the regular Summer problems, number 3 about the poker hand proved to be the most difficult. The Bonus about folding a map was unusually hard, as we received only one correct solution.

FALL SOLUTIONS

Reader's entries for the Fall problems will be acknowledged in the Spring BENT. Meanwhile, here are the answers:

- The bill was \$367.92 and the 72 turkeys cost \$5.11 each. With a handheld calculator, divide 167.95 through 967.95 by 72 and note that 367.95 yields a unit cost closest to an integral number of cents and that 72 divides 367.92 exactly.
- The equation of the parabola that passes through the four given data points is $y^2 + 3x^2 \pm (2\sqrt{3})xy - 2y - 3$

= 0. The generalized equation for a parabola is $ax^2 + bxy + cy^2 + dx + ey + f = 0$, with the further condition that $b^2 = 4ac$, where a and c aren't both zero. (Wikipedia on the internet is one source of these requirements.) Substituting data points (3,0) and (-1,0) in the generalized equation yields $e = -2c$. And, substituting (0,1) and (0,-1) yields $d = 0$ and $a = -f$. The generalized equation then reduces to $ax^2 + bxy + cy^2 - 2cy - a = 0$. Now, substituting data point (3,0) in this equation gives $9c - 6c - a = 0$ or $a = 3c$. Set $c = 1$ and $a = 3$ and the equation becomes $3x^2 + bxy + y^2 - 2y - 3 = 0$. The added constraint that for a parabola, $b^2 = 4ac = 4(3)(1)$ means that $b = \pm 2\sqrt{3}$. Thus, there are actually two parabolas that satisfy the given conditions, one inclined to the right and one inclined to the left.

3 When Beth says, "I know my number" at her eighth opportunity, she had just asked if Ann had a 15, received a "yes" answer, and knew she must have been assigned a 17. At Ann's first opportunity, the only question she can logically ask that will allow her to know her number is, "Is Beth's number a 1?" where a "yes" response would allow her to know she had a 1. Then, at Beth's first opportunity, the only question she can logically ask is, "Is Ann's number 1?" where a "yes" response would allow her to know she had a 3. Then, Ann, at her second opportunity, with two "I don't know my number" responses so far, would logically ask, "Is Beth's number a 3?" where a "yes" response would allow her to know she had a 3. With each additional "I don't know my number," Ann and Beth will deduce what next positive odd number to choose to ask about, until Ann, at her eighth opportunity with all negative responses so far, would ask if Beth had a 15. The "no" response would result in Ann's saying "I don't know my number," and that would prompt Beth to ask if Ann had a 15. She must have received a "yes" response, because she announces she knows her number.

4 The probability that the quadratic equation $x^2 + bx + c = 0$ has complex

roots is $2/(3q^{0.5})$ for $q \geq 4$, and $0.5 - q/24$ for $q \leq 4$, where b and c are both in the range $\pm q$. At $q = 4$, both equations give a $1/3$ probability. A requirement for the quadratic equation to have complex roots is $c > b^2/4$. Prepare a set of Cartesian coordinates with c on the vertical axis and b on the horizontal axis, and plot the parabola $c = b^2/4$. Draw a square with sides $b = \pm q$ and $c = \pm q$. The region yielding complex roots is bounded below by the parabola and above and on the right by the square. Therefore, we have the integral $\int_0^q (q - b^2/4)db$ to evaluate. There are two cases to consider: $q < 4$ for which the parabola will intersect the right edge of the square and $q > 4$ for which the parabola will intersect the top of the square, so the two cases require different upper limits for the integral. For the first case, $z = q$. Using Calculus 101, the value of the integral is $q^2 - q^3/12$, which must be multiplied by 2 (because b can be either positive or negative) and divided by $4q^2$, the total variable space (area of the square). Therefore, $P_{q \leq 4} = 0.5 - q/24$. For the second case ($q > 4$), $z = 2q^{0.5}$ which gives a value of the integral of $4q^{1.5}/3$ and $P_{q > 4} = 2/(3q^{0.5})$.

5 The pool-table cushion height should be $0.7D$ to create a rebound that maintains rolling-without-slipping motion. Conceptually, there is no difference between hitting a stationary ball with a moving cue and hitting a stationary cushion with a moving ball. Therefore, what we are looking for is the "sweet spot," the point on the ball that, when hit, results in rolling-without-slipping motion. From Newton's second law, $F_x = ma_G$, where F_x is the horizontal component of the force exerted by the cushion, m is the ball's mass, and a_G is the acceleration of the center of gravity of the ball. Let h equal the height of the cushion. Then, $F_x(h - r) = I\alpha$, where r is the ball's radius, I its moment of inertia, and α the angular acceleration. For a sphere, $I = 2mr^2/5$. Also, if the ball rolls without slipping, then $\alpha = a_G/r$. Substituting into the torque equation gives $ma_G(h - r) = (2mr^2/5)(a_G/r)$ or $h - r = 2r/5$, so $h = 7r/5 = 7D/10$.

Bonus The range of eccentricities that have an apogee greater than R_s is 0.591 to 0.755. According to Kepler's Law of Periods, $T^2 = (4\pi^2/GM)a^3$, where T is the period, G is the gravitational constant, M is the mass of the Earth, and a is the semi-major axis of the elliptical orbit. Once T is set, then a can be calculated, and all orbits with that T will have the same major axis. Substituting $T = 12(3,600) = 43,200$ s, $G = 6.67 \times 10^{-11}$ m³/kg s², and $M = 5.98 \times 10^{24}$ kg into $a = (GM T^2 / 4\pi^2)^{1/3}$ gives $a = 2.66 \times 10^7$ m. There are two limits for the orbit: (1) the perigee is 100 miles (plus the radius of the Earth) and (2) the apogee is R_s , the radius of the geosynchronous orbit. For Case 1, $R_p = 100(1,610) + 6.37 \times 10^6 = 6.531 \times 10^6$ m, and $R_a = 2a - R_p = 4.67 \times 10^7$ m. Now ea is defined as half the distance between the foci of the ellipse, so $R_p = a - ea$ and $R_a = a + ea$. Solving gives $e = (R_a - R_p) / 2a$. For Case 1, this gives $e_1 = (4.67 \times 10^7 - 0.653 \times 10^7) / (2 \times 2.66 \times 10^7) = 0.755$. For Case 2, $R_a = 26,300(1,610) = 4.23 \times 10^7$ m and $R_p = 2a - R_a = 1.09 \times 10^7$, which give $e_2 = (4.23 \times 10^7 - 1.09 \times 10^7) / (2 \times 2.66 \times 10^7) = 0.591$.

Double Bonus. The last seven digits of 7,777,777^{7,777,777} are 5,347,697. The general approach for solving problems of this type (i.e., what are the final n digits of N^E) is as follows. Create a table with four columns. In Column 1, write 0, 1, 2, 3, ... In Column 2, enter the corresponding powers of 2 which are less than E , i.e., enter 1, 2, 4, 8, 16, ... In Column 3, enter the last n digits of the powers of N corresponding to Column 2. This is easily done by starting with N and squaring each successive entry and retaining only the last n digits. Now, with the aid of Column 2, it is easy to express E as the sum of powers of 2. Next, transfer to Column 4 those entries in Column 3 that correspond to the powers of 2 that sum to E . Finally, starting at the top of Column 4, successively multiply each value by the next value, retaining only the last n digits; the final calculation will be the desired answer. For this problem, $N = 7,777,777$ and $E = 7,777,777 = 2^{22} + 2^{21} + 2^{20} + 2^{18} + 2^{17} + 2^{15} + 2^{13} + 2^{11} + 2^{10} + 2^8 + 2^7 + 2^6 + 2^5 + 2^4 + 2^0$. Therefore, after creating Columns 1, 2, and 3, use Column 3 entries 1, 5, 6, 7, 8, 9, 11, 12, 14, 16,

18, 21, 22, and 23 to calculate the last 7 digits of 7,777,777^{7,777,777} as 5,347,697. The calculations are easily carried out on a spreadsheet, provided it has 16-digit precision.

NEW WINTER PROBLEMS

1 How many primes appear in the following sequence: 9; 98; 987; 9,876; ...; 9,876,543,210; 98,765,432,109; 987,654,321,098; and so on?
—Daryl Cooper

2 Find two three-digit integers that sum to a four-digit integer such that each of the digits 0 through 9 is used, with no leading zeros. What are the maximum and minimum values for the four-digit integer?
—*The Playful Brain* by Richard Restak and Scott Kim

3 Bill has a problem. He has locked his Tau Beta Pi pin in a strong box and forgotten the combination. The lock uses all the digits 1 through 6 in some order. He has tried the following three combinations: 4-5-6-1-3-2 which has one digit correct; 6-2-3-4-5-1 which has two digits correct; and 2-3-1-6-4-5 which has three digits correct. What is the combination?
—*The Everything Brain Strain Book* by Jake Olefsky

4 Mac is idly tossing two dice when he decides to see how many tosses it would take to go from 1 to 6 in order. The rules are to toss the two dice until one or the other or both show a 1. Then, toss until a 2 shows. However, if both a 1 and a 2 show at the same time, both can be used. He then tosses for a 3 and similarly for other numbers. What is the expected number of tosses to go from 1 to 6? Once you have the answer, get a couple of dice and play the game a few times to see how closely the average matches your answer.
—Howard G. McIlvried III, PA Γ '53

5 A distinct positive integer has been assigned to each letter of the alphabet such that the letters of PLUTO add to 40; URANUS 36; NEPTUNE 29; SATURN 33; JUPITER 50; MARS 32; Earth 31; MOON 36; VENUS 39; MERCURY 33; and SUN 18. What is

the value of PLANETS? Get a pencil and paper and solve this one without computer help!

—C. W. Haigh in *New Scientist*

Bonus. Start with a checker in the center of a 5x5 checkerboard. The objective is to move the checker from square to square so that each square is visited exactly once, except the center square to which you must return on your 25th move. The only legal moves are to a square that is two squares away diagonally or to a square that is three squares away horizontally or vertically. How many unique paths can the checker trace? Rotations, reflections, path reversals, and combinations thereof, are not considered different paths. This problem can be solved without computer help.
—William W. Verkuilen, WI B '92

Computer Bonus. Beginning with any multi-digit number, N , start a sequence by writing its digits in order, starting with the left-most digit. The next number in the sequence is the sum of the digits of N . Continue with a Fibonacci-like process, where the next term in the series is the sum of the previous n terms, where n is the number of digits in N . If N appears in this sequence, then N is a Keith number, named after Michael Keith, who discovered them. For example, 197 is a Keith number because 1, 9, 7, 17, 33, 57, 107, 197, ... contains N . The four smallest Keith numbers that are also prime numbers are 19, 47, 61, and 197. What is the next smallest prime Keith number?
—Fred J. Tydeman, CA Δ '73

Send answers to any or all of these Brain Ticklers to **Curt Gomulinski, Tau Beta Pi, P. O. Box 2697, Knoxville, TN 37901-2697** or email to BrainTicklers@tbp.org only as plain text. The cutoff date for entries to the Winter column is the appearance of the Spring BENT in early April. The method of solution is not necessary. We welcome problems that might be suitable for the column. The Computer Bonus is not graded. Curt will forward entries to the judges who are **H. G. McIlvried III, PA Γ '53**; **F. J. Tydeman, CA Δ '73**; **J. L. Bradshaw, PA A '82**; and the columnist for this issue:
—D.A. Dechman, TX A '57.



CHAPTER ETERNAL

The condensed style of these notices of death is made necessary by Tau Beta Pi's large membership and space limitations in THE BENT. You may email or write the Editor for further facts concerning the following deceased members. The assistance of all is earnestly sought in reporting the deaths of Association members, with appropriate details.

- AL A '41 **Lapsley, George W.**; March 30, 2011.
 '48 **Stephenson, William E.**; June 1, 2011.
 '54 **Piazza, Michael A.**; June 5, 2011.
 '58 **Shelley, Francile S.**; October 1, 2011.
- AL B '38 **Nolen, Jake T.**; no details.
 '40 **Teague, Beal M.**; September 25, 2011.
 '41 **Greene, John H.**; no details.
 '45 **Wilder III, Thomas W.**; no details.
 '48 **Killingsworth, Roy W.**; no details.
 '48 **Wheless, Robert H.**; June 16, 2007.
 '49 **Sanders, Guy J.**; no details.
 '49 **Thomas Jr., Ester L.**; no details.
 '49 **Wall, Richard H.**; no details.
 '50 **Carr, James B.**; no details.
 '51 **Hjorth, Eugene P.**; August 4, 2011.
 '51 **Rey, Robert F.**; no details.
 '57 **Culpepper, Bennie G.**; no details.
 '58 **Gregoire, Anthony D.**; no details.
 '61 **Rayfield Jr., Lewis E.**; no details.
 '64 **Justice, Ronnie C.**; no details.
- AZ A '42 **Tizard, William**; no details.
 '48 **Holmquist, Lars**; no details.
 '49 **Larson, Marvin E.**; August 7, 2011.
 '67 **Farmer, Bruce W.**; no details.
 '06 **Amene, Nkiru J.**; no details.
- AR A '49 **Fletcher Sr., Leland D.**; January 2, 2008.
 '51 **North, Omer C.**; no details.
 '53 **Vanderslice, Warren D.**; December 12, 1998.
 '55 **Lashley, David E.**; no details.
- CA A '38 **Hall, Richard E.**; no details.
 '39 **Goette, Carl A.**; September 15, 2003.
 '40 **Crapuchettes, Paul W.**; September 24, 2011.
 '41 **Martinelli, E.A.**; January 5, 2010.
 '48 **Morketter, Robert S.**; August 10, 2011.
- CA B '46 **Jensen, Louis K.**; May 15, 2011.
 '57 **Rauch, Herbert E.**; March 29, 2011.
- CA Γ '43 **Grey, John R.**; May 13, 2011.
 '51 **Goodrich, Philip E.**; no details.
 '63 **Earlougher Jr., Robert C.**; August 19, 2011.
 '84 **Howard, Robert A.**; July 22, 2011.
- CA Δ '47 **Bumsted, Edmund J.**; October 15, 1996.
 '48 **Frandsen, Leroy**; July 13, 1999.
 '48 **Franke, Dallas V.**; August 22, 2007.
 '48 **Kerfoot, Hubert P.**; April 27, 2004.
 '48 **Nielsen, Foss A.**; January 14, 1997.
 '48 **Perry Jr., John T.**; May 14, 1997.
 '48 **Peterson, Robert W.**; January 27, 2009.
 '48 **Pugh, Paul F.**; December 2, 1997.
 '48 **Purmort, Louis E.**; February 25, 2003.
 '48 **Rodriguez Jr., Charles F.**; September 12, 2003.
 '48 **Rosenberg, Elliot**; June 15, 2001.
 '48 **Stensgaard, Robert G.**; August 1, 2004.
 '48 **Sterling, Morton A.**; March 7, 1998.
 '48 **Tomblin, Edward R.**; January 13, 2010.
 '48 **Whitaker, Earl J.**; February 22, 1995.
 '48 **Willens, Daniel**; no details.
 '49 **Adams, Paul R.**; July 11, 2003.
 '49 **Alley, Donald J.**; July 11, 2002.
 '49 **Aragon, Jesse**; October 25, 2007.
 '49 **Bonny, Joe V.**; March 22, 2008.
 '49 **Boster, Clark S.**; February 17, 2006.
 '49 **Brugger, Walter A.**; August 10, 2007.
 '49 **Dippel, Charles R.**; June 23, 2003.
 '49 **Downs, Robert K.**; December 15, 1994.
 '49 **Eichel, Henry H.**; October 31, 1988.
 '49 **Fernandes, Robert J.**; no details.
 '49 **Goodman, Kenneth**; December 8, 2006.
 '49 **Hutton, Robert E.**; December 13, 2004.
 '49 **Jones, Howard L.**; no details.
 '49 **Klecker, Raymond W.**; December 8, 2007.
 '49 **Koukol, Joseph F.**; October 18, 2007.
 '49 **Kroman, Manuel**; October 11, 2009.
 '49 **Ley, James E.**; September 6, 2003.
 '49 **Mathisen, Dan W.**; February 24, 2007.
 '49 **Miller, Ellison F.**; March 16, 1998.
 '49 **Quick, Ronald G.**; November 13, 2000.
 '49 **Redd, Harold K.**; February 5, 2004.
 '49 **Simmons, Carroll A.**; November 29, 2006.
 '49 **Skoog, Donald K.**; no details.
 '49 **Staub, Harrison L.**; July 10, 2004.
 '49 **Wisner, Benjamin G.**; April 22, 2007.
 '50 **Alfring, Richard J.**; no details.
 '50 **Ault, Cyrus F.**; August 14, 2010.
 '50 **Bleak, Blayne M.**; July 2, 1993.
 '50 **Bonser, William D.**; March 22, 1992.
 '50 **Broder, Alan**; November 3, 1993.
 '50 **Devisser, Burton A.**; September 1, 2001.
 '50 **Durall, Benoni F.**; February 16, 2001.
 '50 **Easton, Edward A.**; March 31, 1995.
 '50 **Forester, Peter**; August 13, 1996.
 '50 **Foy, Charles T.**; no details.
 '50 **Johnson, Robert T.**; no details.
 '50 **Kastius, William A.**; November 14, 2000.
 '50 **Kazarian, Bob**; July 12, 1994.
 '50 **King, Wesley C.**; no details.
 '50 **Labadie, Paul A.**; May 8, 1995.
 '50 **Lung, John D.**; August 12, 2005.
 '50 **McEvoy, Edwin W.**; January 2, 2009.
 '50 **Melrose, Richard E.**; March 18, 2006.
 '50 **Miller, Arthur E.**; November 12, 2009.
 '50 **Perkins, Robert R.**; June 19, 1992.
 '50 **Ronk, Glenn E.**; January 15, 2005.
 '50 **Saunders, Walter D.**; October 31, 2000.
 '50 **Schneider, Robert R.**; July 29, 2009.
 '50 **Sellers, Walter D.**; January 29, 2009.
 '50 **Stackhouse, Wilson**; April 7, 2011.
 '50 **Van Geem, Earl T.**; July 20, 2008.
 '50 **Wannamaker, Clayton G.**; May 16, 2010.
 '51 **Arrowsmith, Norman M.**; June 16, 2007.
 '51 **Bigelow, Herbert L.**; no details.
 '51 **Bradley, Charles W.**; October 29, 2007.
 '51 **Cline, Richard P.**; May 26, 2008.
 '51 **Coker, Frank B.**; August 20, 2010.
 '51 **Drever, James E.**; October 1, 2008.
 '51 **Gatlin, Carl**; no details.
 '51 **Gelly, George V.**; May 28, 1995.
 '51 **Geyer, Herbert**; no details.
 '51 **Hoch, John L.**; November 10, 1998.
 '51 **Hoskins, Thomas R.**; October 31, 2009.
 '51 **Jackson, Robert O.**; January 6, 2009.
 '51 **Jarrett, Hilton F.**; January 22, 2005.
 '51 **Kannel, Edgar**; December 17, 2005.
 '51 **Magadini, Charles R.**; November 3, 2010.
 '51 **Meany, Herbert J.**; May 20, 2011.
 '51 **Miller, Kenneth F.**; September 8, 2009.
 '51 **Niebuhr, John E.**; September 21, 1998.
 '51 **Nourse, Robert B.**; March 16, 2006.
 '51 **Schweinfest, Robert C.**; no details.
 '51 **Sturgill, Robert A.**; August 15, 2002.
 '51 **Suter, Vane E.**; February 10, 2011.

'51 **Waugh, Julian S.**; no details.
 '51 **Wichman, Robert H.**; no details.
 '52 **Aikman, Gerald N.**; November 3, 2009.
 '52 **Blackman, Martin S.**; no details.
 '52 **Columbus, Ellis N.**; November 10, 1988.
 '52 **Hansen, William R.**; April 12, 1991.
 '52 **Hirt, William F.**; November 22, 1991.
 '52 **Jagger, Edgar J.**; no details.
 '52 **Lahey, Charles J.**; November 16, 1996.
 '52 **Nalley, Robert E.**; September 21, 2007.
 '52 **Saunders, David C.**; May 21, 2005.
 '52 **Waggoner Jr., Donald E.**; no details.
 '52 **Willardson, Richard E.**; February 27, 2006.
 '52 **Young, James R.**; November 19, 2008.
 '53 **Bauman, Charles R.**; no details.
 '53 **Dockery, Bill D.**; July 30, 1997.
 '53 **Drucker, Shelby**; no details.
 '53 **Martin, Frederick H.**; October 15, 1987.
 '53 **Mellos, Samuel**; April 28, 2009.
 '53 **Nelson, Clifford G.**; no details.
 '53 **Preston Jr., Warren O.**; June 6, 1994.
 '53 **Price, Emory E.**; no details.
 '53 **Siegel, John H.**; July 2, 2008.
 '53 **Sybert, Warren M.**; March 7, 2007.
 '53 **Tressel, Ronald F. X.**; April 14, 2011.
 '54 **Clanton, Robert A.**; January 28, 2009.
 '54 **Diemer, Donald K.**; April 12, 2005.
 '54 **Flatto, Herbert D.**; January 11, 2005.
 '54 **Johnson, Dale E.**; no details.
 '54 **Newbury, Ray S.**; December 9, 2003.
 '54 **Overholt, Marlin R.**; July 24, 2009.
 '54 **Polley, Clarence D.**; July 1, 2008.
 '54 **Rusch, Willard V.T.**; May 27, 1992.
 '54 **Shoemaker, Vaughn R.**; September 19, 2005.
 '54 **Taylor, Robert L.**; May 22, 2004.
 '54 **Turney, Hubert W.**; May 10, 2006.
 '55 **Egashira, Ichio**; June 13, 2011.
 '55 **Evans, James R.**; March 27, 2000.
 '55 **Forster, Donald C.**; no details.
 '55 **Foxworthy, James E.**; April 5, 2009.
 '55 **Hacquest, Charles F.**; no details.
 '55 **Holmberg Jr., Ivan G.**; no details.
 '55 **Kapp, Benjamin**; June 4, 2010.
 '55 **McGaffey, Herbert F.**; April 14, 2009.
 '55 **Miller, Courtney P.**; no details.
 '55 **Oh, Dennis**; May 1, 2001.
 '56 **Appley, Warren A.**; August 6, 2009.
 '56 **Baker, Wallace L.**; February 9, 2008.
 '56 **Emerzian, Robert**; August 2, 2004.
 '56 **Gratrix Jr., William A.**; no details.
 '56 **Hazzard, Rutledge P.**; December 27, 2008.
 '56 **Higashi, Paul**; November 15, 2010.
 '56 **Holman Jr., Jonathan L.**; December 16, 2002.
 '56 **Jones, Herbert J.**; October 12, 2003.
 '56 **Mc Elveen, Kenneth H.**; April 11, 2004.
 '56 **Schlenger, William R.**; January 11, 2002.
 '56 **Willcox, Edwin J.**; March 6, 1996.
 '56 **Wilson, Harold D.**; October 30, 2001.
 '57 **Carroll, Vernon E.**; no details.
 '57 **Gregory, Edward M.**; no details.
 '57 **Hankey, Eugene D.**; May 15, 1991.
 '57 **Lusk, James R.**; October 31, 1997.
 '57 **McInnis, Andrew M.**; April 30, 2008.
 '57 **Nelson, Melvin A.**; February 23, 2002.
 '57 **Oddo, Joseph A.**; September 9, 2004.
 '57 **Renfrew, William**; no details.
 '57 **Sakai, Yukio**; April 13, 2006.
 '57 **Salibian, Albert**; June 28, 2005.
 '57 **Sundin, Lloyd D.**; no details.
 '57 **Vassau, Ronald E.**; September 22, 1997.
 '58 **Blanchard, Roger H.**; September 28, 2003.
 '58 **Bopp, Charles P.**; July 24, 2010.
 '58 **Calman, Arthur**; February 22, 1988.

'58 **Graham, John C.**; July 19, 1997.
 '58 **Jennings, Bert R.**; July 1, 1997.
 '58 **Lingon, Stanley**; October 1, 2010.
 '58 **McCaffrey, William H.**; November 30, 2004.
 '58 **Posner Jr., Harry A.**; August 9, 2008.
 '58 **Rasmussen Jr., Albert C.**; September 29, 1994.
 '58 **Valiquette, Donley J.**; August 31, 2011.
 '59 **Cade, James T.**; April 5, 1994.
 '59 **Colgan, Fred R.**; July 24, 2007.
 '59 **Copeland, Bruce A.**; no details.
 '59 **Fuller, Dean M.**; January 8, 1992.
 '59 **Gerber, Wesley D.**; May 29, 2003.
 '59 **Holtrichter Jr., John**; April 19, 2008.
 '59 **Knight, Larry E.**; October 29, 2003.
 '59 **Lee, Ronald H.**; March 8, 2002.
 '59 **Lewis, Edwin A.**; April 4, 2001.
 '59 **Nelson Jr., E. Ellis**; August 19, 2001.
 '59 **Padia, Russell F.**; November 22, 1992.
 '59 **Stern, George J.**; April 24, 2001.
 '59 **Wood Jr., John L.**; March 3, 1997.
 '60 **Chew, Louis**; May 5, 2005.
 '60 **Conn Jr., Charles E.**; May 13, 1999.
 '60 **Nettels, Edward F.**; July 30, 1989.
 '60 **Raynesford, John D. G.**; March 15, 1992.
 '60 **Rogers, William P.**; September 24, 2002.
 '60 **Weber, Dale J.**; August 20, 2007.
 '60 **Wilkerson, Robert L.**; July 26, 1999.
 '61 **Dexter, Paul F.**; June 25, 2000.
 '61 **Douglas, Malcolm G.**; November 4, 2007.
 '61 **Dryden, Roth M.**; January 19, 2008.
 '61 **Faucett, Richard S.**; November 30, 1999.
 '61 **Fisher, Donald H.**; August 8, 2010.
 '61 **Guard, Frederick L.**; February 16, 1997.
 '61 **Sutphin, David L.**; January 16, 2010.
 '62 **Evans, Larry E.**; April 23, 2002.
 '62 **Fee, Maurice L.**; April 27, 2011.
 '62 **Foulger, Charles R.**; September 14, 2004.
 '62 **Martin, Glenn E.**; October 26, 2001.
 '62 **Nelson, Daniel F.**; August 25, 1999.
 '62 **O'Reilly, William J.**; no details.
 '62 **Ostrom, Richard A.**; February 28, 2009.
 '62 **Poer, Donald G.**; January 10, 1997.
 '62 **Rooney, William A.**; December 6, 1993.
 '63 **Feldman, John L.**; February 9, 2005.
 '63 **Gilley, Cleveland H.**; August 6, 2000.
 '63 **Kishimoto, Eddie T.**; December 6, 2010.
 '63 **Pro, Stanley**; February 21, 2006.
 '64 **Hilty, James R.**; May 18, 2003.
 '65 **Burnett, Carl L.**; August 15, 2011.
 '66 **Sosa, Raul**; June 14, 2008.

In Memory

Dr. Richard L. Turner, Pennsylvania Zeta '46, Tau Beta Pi Executive Councillor during 1978-82, died on September 5, 2011. A former as-



sociate professor of electrical engineering at Seattle University, he received his bachelor's and master's degrees in electrical engineering from Drexel University in 1946 and 1952 and his doctorate from the University of Washington in 1962. He also worked for the Navy's aircraft modification unit in Johnsville, PA, and Thomas A. Edison Inc. in West Orange, NJ. He had taught at Drexel University, in Caracas, Venezuela for a year,

and at the University of Washington. His professional interests involved computer and digital systems. A member of Eta Kappa Nu and Sigma Xi, he previously served as the Northwest regional secretary for the ASEE as well as being the Northwest coordinator for student activities of the IEEE. He was a chapter Advisor for Washington Gamma and previously served Washington Alpha and Pennsylvania Zeta in similar posts.

CHAPTER ETERNAL

- CA Δ '67 **Lewis, Gunter H.**; November 22, 1995.
'67 **Mushin, Ronald S.**; December 28, 2000.
'68 **Hardenbergh, Hal W.**; June 27, 2008.
- CA Θ '77 **Brock, Robert G.**; August 22, 2011.
- CO A '39 **Hall, Alan E.**; no details.
'50 **Benton, Douglas F.**; July 14, 2011.
'65 **Pletcher, Ronald E.**; September 13, 2011.
- CO B '60 **Edmonds, Dean C.**; September 2, 2011.
- CT A '40 **Smith, Robert H.**; November 27, 2006.
'57 **Roche, John M.**; June 25, 2010.
'62 **Morlok Jr., Edward K.**; April 18, 2009.
- CT B '58 **Balinskas, Robert J.**; April 7, 2011.
- DE A '40 **Cotty, Percy J.**; December 19, 2005.
- DC B '62 **Swann Jr., Benjamin R.**; July 22, 2011.
'63 **Santi, Dario R.**; no details.
- FL A '40 **Stanton, Curtis H.**; August 15, 2011.
- FL B '64 **Bernardo, Jose R.**; March 2, 2002.
- GA A '25 **Barton, Hertwell P.**; no details.
'44 **Bazemore, Thomas C.**; December 1, 2010.
'47 **Chandler, Dave P.**; March 23, 2011.
'47 **Hammill, Frederick M.**; no details.
'47 **Moeller, Dade W.**; September 26, 2011.
'49 **French, James T.**; May 19, 2011.
'50 **Usry, Robert O.**; March 29, 2006.
'50 **Walton Jr., Jesse D.**; February 11, 2011.
'52 **Godbee, Herschel W.**; October 28, 2011.
'52 **Philpot Jr., Clifton H.**; July 24, 2011.
'53 **Boggs, George D.**; October 3, 2011.
'54 **Cone Jr., Clarence D.**; December 27, 2008.
'65 **Barrett, Richard F.**; no details.
- ID A '43 **Bolton, Donald F.**; August 1, 2011.
- IL A '54 **Walther, Herbert C.**; February 15, 2011.
'56 **Albert, David P.**; no details.
'59 **McClurg, William C.**; July 19, 2011.
- IL B '38 **Dehart, Robert C.**; June 3, 1998.
'45 **Linhart, George W.**; November 19, 2005.
'45 **Nelson, Herman W.**; July 22, 2011.
'46 **Pritzker, Robert A.**; October 27, 2011.
'52 **Beach, Rex E.**; September 10, 2008.
- IL Γ '49 **Cember, Herman**; March 7, 2008.
- IL Δ '65 **Thompson, Robert G.**; December 24, 1994.
- IN A '40 **Wanzenberg, Fritz W.**; February 21, 2002.
'43 **Hansen, Robert**; July 28, 2009.
'43 **St Clair, Charles R.**; December 3, 1999.
'46 **Herrman, Howard E.**; no details.
'46 **Webb Jr., Glen C.**; June 9, 2011.
'48 **Boatright, Ned C.**; July 11, 2010.
'48 **Griffith, John H.**; October 21, 2011.
'48 **Pettus, Jack D.**; February 2, 2010.
'50 **Breaz, Emil**; no details.
'50 **Burch Sr., Henry O.**; August 8, 2007.
'50 **Rodemann, Carl E.**; July 23, 2011.
'51 **Christensen, Elliott S.**; June 21, 2011.
'52 **Craun, John R.**; no details.
'57 **Ordog, Stephen**; May 10, 2011.
'57 **Robinett, Max J.**; October 30, 2010.
- IA A '89 **Burke, David A.**; April 13, 2011.
- IA B '50 **Haerther, Lester W.**; March 24, 2010.
'65 **Hronik, Edward J.**; no details.
- KS A '38 **Lovelace, Charlie H.**; July 31, 2011.
'39 **Larson, George H.**; no details.
'43 **Martin, C. Frank**; April 15, 2010.
'49 **Mesler, Russell B.**; July 29, 2011.
'55 **McClure, James D.**; July 25, 2011.
- KY A '54 **Browning, Abner L.**; May 21, 2002.
'57 **Henderson, Joseph S.**; no details.
'61 **Cline Jr., Allen D.**; August 26, 2011.
- KY B '43 **Gerhard, Earl R.**; no details.
- LA A '37 **Ramsey Jr., Ambrose K.**; January 22, 2000.
'50 **McKnight, Stacy**; October 21, 2011.
- LA Γ '64 **Wright, James A.**; June 29, 2011.
- ME A '32 **Murphy, Francis D.**; January 20, 2011. [Centenarian 76]
'48 **Crossland, Burton W.**; no details.
'49 **Simpson, Wray D.**; February 22, 2011.
'51 **Ayer, James E.**; September 16, 2011.
- MD A '53 **Park, August R.**; July 19, 2011.
- MD B '58 **Burns, Robert A.**; February 16, 2010.
'80 **Beard Jr., Warren T.**; November 18, 2009.
- MA A '56 **Mulno, Robert E.**; September 23, 2011.
'78 **Walton Jr., William H.**; February 8, 2009.
'04 **Matejik, Laura A.**; March 21, 2011.
- MA B '38 **Donlan, Charles J.**; September 28, 2011.
'43 **Hill, Stewart M.**; March 7, 2011.
'44 **Rinaldo, Peter M.**; May 2, 2008.
'51 **Conley, John W.**; June 24, 2011.
'56 **Amster, Herbert S.**; October 13, 2010.
'61 **Ogden, Edward G.**; August 25, 2011.
'68 **Rodriguez-Agrait, Leandro**; May 2010.
- MA Δ '43 **Ginsparg, Joshua O.**; July 12, 2010.
'48 **Welch, Albert F.**; September 3, 2011.
- MA E '50 **Bates, Charles L.**; June 2, 2001.
'51 **Giovanoni, Mary J.**; September 9, 2007.
'54 **Danforth Jr., Warner C.**; September 13, 2011.
- MI A '41 **Sharpe Jr., C. Granville**; no details.
'51 **James, Robert G.**; no details.
'60 **Barevics, Vilis M.**; December 24, 2010.
- MI B '38 **King, Michael E.**; November 17, 2004.
'40 **Bowers, William B.**; June 20, 2006.
'43 **Cronenworth, Charles D.**; no details.
'47 **Handberg, Peter N.**; no details.
'49 **Barton, Willard R.**; no details.
'53 **Laurich, Robert**; June 2011.
'54 **Schettler, Robert B.**; April 6, 1998.
'74 **Nash, Gaynor L.**; August 8, 2009.
- MI Γ '37 **Sutin, Hillard A.**; October 12, 2008.
'39 **Spoden, Harold T.**; no details.
'50 **Harf, Frederic H.**; no details.
'69 **Herrin, Gary D.**; August 18, 2011.
- MI Δ '39 **Addy, John L.**; no details.
- MI E '80 **Kuchta, Henry M.**; no details.
- MI Z '41 **Dunkle, Andrew J.**; August 26, 2011.
- MN A '58 **Thomas, Leo J.**; April 11, 2011.
- MS A '59 **Matthews, Gerald A.**; July 19, 2011.
- MO B '42 **Claassen, Edwin J.**; December 9, 2010.
'45 **Sheppard, Keith D.**; July 28, 2011.
'46 **Jones, Raymond B.**; no details.
'53 **Topel, Maurice R.**; no details.
'54 **Ashley, Wilford M.**; no details.
'64 **Cusumano, Joseph V.**; March 14, 2008.
'70 **Kistler, R. Stanley**; no details.
- MO Γ '35 **Schulze, Russell K.**; May 28, 2011.
'37 **Van Lund, John A.**; no details.
'48 **Thompson, Robert W.**; April 23, 2011.
- NH A '49 **Mindt, Frederick E.**; July 17, 2011.
- NJ A '53 **Meyer, Robert H. A.**; December 21, 2010.
- NJ B '48 **Zablocki, Henry S.**; May 22, 2009.
- NJ Γ '39 **Erickson, Lars E.**; May 23, 2011.
'48 **Wells, Edwin L.**; June 14, 2011.
'51 **Belamarich, Joseph P.**; April 30, 2010.
'51 **Finn, George T.**; July 10, 2011.
'52 **Durstewitz, Gerald**; June 10, 2011.
- NJ Δ '40 **McEldowney Jr., Robert**; October 3, 2011.
'41 **Watkins, George H.**; February 8, 2011.
- NM A '75 **Deinlein, William S.**; no details.
- NM B '62 **Baca, Jose R.**; June 6, 2002.
- NY A '41 **Dorsa, Charles S.**; no details.
'43 **Kiachif, Menutcher F.**; no details.
'46 **Piper, William W.**; no details.
'55 **Kramer, Fred W.**; no details.
'57 **Gitten, Lawrence J.**; September 10, 2005.
'48 **Hoag, Daniel S.**; no details.
'49 **Murphy, Robert E.**; no details.
'50 **Hatch Jr., Arthur J.**; no details.
'51 **Graham, Alfred R.**; no details.
'52 **Karl, Ludwig L.**; no details.
'56 **Marcalus, Vincent J.**; no details.

- '56 **Rogers, Charles E.**; April 14, 2011.
 '58 **Feller, David L.**; no details.
 NY I '51 **Day, Charles B.**; August 17, 2011.
 '51 **Finck Jr., Fred P.**; February 8, 2010.
 '51 **Thomas, Donald E.**; no details.
 '51 **Twomey, Edward J.**; April 29, 2011.
 '55 **Jones, Gordon W.**; June 10, 2011.
 NY Δ '41 **Sterling Jr., John C.**; no details.
 '42 **Thorpe, Raymond G.**; September 6, 2005.
 '43 **Brown Jr., Scott L.**; October 26, 2010.
 '43 **Underwood, Robert H.**; August 15, 2011.
 '48 **Oberg, Donald E.**; February 14, 2010.
 '58 **Whalen, James J.**; May 26, 2011.
 '59 **Mengert, Peter H.**; September 13, 2010.
 '62 **Carlson, Robert C.**; September 6, 2011.
 '75 **Riera, Marco E.**; August 1, 2010.
 NY E '38 **Durfee Jr., Charles D.**; October 7, 2011.
 '47 **Marchetto, Caesar P.**; December 18, 2009.
 '51 **Luckhowec, John J.**; May 2010.
 NY Z '42 **Mandel, Mervyn W.**; August 22, 2011.
 '49 **Gavis, Jerome**; February 8, 2011.
 '51 **Kabrisky, Matthew J.**; February 18, 2011.
 '56 **Whang, Sang Y.**; January 24, 2011.
 '58 **Shelley, Joseph F.**; 2009.
 NY Θ '52 **Ayers II, William R.**; April 17, 2011.
 NY I '41 **Deutsch, Sid**; January 8, 2011.
 '47 **Ennis, Herbert E.**; August 5, 2011.
 '49 **Ariessohn, Arthur M.**; July 19, 2008.
 '51 **Auerbach, Philip B.**; February 4, 2011.
 NY N '50 **Greatbatch, Wilson**; September 27, 2011.
 NY Ξ '50 **Wessbecher, Francis W.**; April 5, 2011.
 '65 **Wolkenberg, Paul R.**; April 14, 2011.
 NY P '56 **Snyder, Joel B.**; June 5, 2011.
 NC A '39 **Babcock, Willard F.**; no details.
 '49 **Rice, Charles M.**; no details.
 '50 **Harrell, Jack M.**; January 5, 2009.
 '52 **Hadlow, Robert E.**; no details.
 '53 **Thurman, Maxwell R.**; no details.
 '58 **Vogler, John F.**; May 10, 2011.
 '82 **Tyl, Thomas W.**; no details.
 NC Γ '53 **Tucker Jr., Royster M.**; May 30, 2008.
 ND A '36 **Shannon Jr., Sidney R.**; July 18, 2011.
 OH A '44 **Weise, Milton F.**; no details.
 '46 **Blicher, Casimir P.**; no details.
 '49 **Reinker, Richard C.**; September 23, 2011.
 '50 **Enyedy Jr., Gustav**; June 9, 2011.
 '55 **Kumler, Gary B.**; no details.
 OH B '38 **Cornelius, Walter**; August 5, 2011.
 '47 **Boerstler, Leslie H.**; September 29, 2011.
 '50 **Webster, Charles M.**; July 9, 2011.
 OH Γ '41 **Borchers, Perry E.**; no details.
 '43 **Hullinger, Lewis C.**; May 16, 2011.
 '48 **Churton, Paul M.**; July 31, 2009.
 '49 **Dorsey, Robert S.**; no details.
 '50 **Swagert, Everett D.**; February 17, 2010.
 '52 **Deminski, Richard M.**; no details.
 '52 **Huntley, Eugene V.**; February 23, 2011.
 OH E '60 **Joseph, Roy D.**; December 17, 2010.
 OH H '53 **Kepler, Harold B.**; August 24, 2011.
 OH Θ '67 **Cervay, Russell R.**; November 22, 2003.
 OH I '59 **Chiles, Emil E.**; August 11, 2011.
 OK A '37 **Pearce, Wilfred A.**; April 2, 2009.
 '49 **Hurley, Leo M.**; June 29, 2003.
 OK Γ '77 **Bair, David L.**; July 20, 2011.
 OR A '39 **Popovich, Milosh**; April 18, 2011.
 PA A '40 **Truchsess, Harold F. J.**; July 7, 2009.
 '54 **Westerman, William L.**; April 18, 2010.
 PA B '49 **Meisel, Donald D.**; December 30, 2010.
 PA Γ '36 **Dennison, Richard W.**; July 11, 2011.
 '37 **Briner, Lewis D.**; no details.
 '40 **Ralston, Thomas E.**; no details.
 '42 **Beckstrom, Wallace M.**; no details.
 '42 **Stulen, Frank L.**; no details.
 '46 **Sherman, Alex**; no details.
 PA Δ '48 **Wiegand, H.A. Arthur**; no details.
 '56 **Wolf, Jack K.**; May 12, 2011.
 '68 **Richardson Jr., Charles A.**; February 20, 2002.
 PA E '50 **Helman, Robert W.**; May 13, 2011.
 PA Z '46 **Turner Jr., Richard L.**; September 5, 2011.
 PA K '42 **Evans, Thomas P.**; no details.
 PR A '70 **Caban-Giovanetti, Reinaldo**; November 21, 2009.
 RI A '48 **Greis, Howard A.**; no details.
 '50 **Flack, Thomas M.**; October 27, 2010.
 RI B '63 **Devine, Maurice C.**; October 16, 2011.
 SC A '49 **Eskridge, Wilton**; September 26, 2011.
 SC B '47 **McCrary, Marvin L.**; June 28, 2011.
 '00 **Anderson, Steven C.**; April 28, 2011.
 SC Γ '61 **Wintzer, Louis A.**; July 12, 2008.
 SD A '94 **Swingholm, Lafette A.**; October 9, 2011.
 TN A '55 **Bunn, Robert F.**; May 5, 2010.
 '58 **Tylor, Richard R.**; January 23, 2011.
 '59 **Whitley, Grover C.**; November 4, 2011.
 TX A '39 **Headrick, James M.**; February 25, 2011.
 '43 **Miller, William E.**; April 9, 2011.
 '44 **Winsauer, Weldon O.**; no details.
 '51 **Ligon, Joe D.**; May 1, 2009.
 '68 **Johnson, Lawrence G.**; September 20, 2001.
 '69 **Ferguson, Richard F.**; no details.
 '91 **Barker, Phillip J.**; January 15, 2011.
 TX B '48 **Helmets, Donald J.**; October 18, 2004.
 '51 **Henderson, Joseph A.**; May 24, 2004.
 '52 **Crawford, Duane A.**; October 18, 2002.
 '67 **Cannon, Stephen L.**; May 29, 2000.
 '70 **Davis, Robert E.**; no details.
 '76 **Vaughn, Raymond C.**; October 4, 2004.
 TX Γ '39 **Morris, Henry M.**; February 25, 2006.
 '49 **Attwell, Leonard L.**; no details.
 '63 **Greene Jr., Ernest R.**; September 27, 2011.
 TX Δ '36 **Bovay Jr., Harry E.**; May 24, 2011.
 '63 **Shinn, Homer R.**; April 21, 2011.
 '68 **Odum, George A.**; no details.
 '76 **Clark, Richard A.**; September 7, 2011.
 TX E '47 **Motard, Rodolphe L.**; April 23, 2011.
 TX I '76 **Caswell, Richard S.**; September 7, 2009.
 UT A '37 **Borg, Grant K.**; February 15, 1999.
 '39 **Shilling, Richard D.**; no details.
 VA A '41 **Stringfellow, Charles S.**; March 6, 2011.
 '48 **Daniel Jr., John M.**; no details.
 VA B '42 **Pentecost Jr., Aubrey R.**; December 25, 2009.
 '47 **Wellborn, James C.**; no details.
 '50 **Wente, Hermann A.**; July 26, 2011.
 '51 **Edmonds, Garland T.**; no details.
 '60 **Anderson, James K.**; no details.
 WA B '33 **Reaugh, Orland H.**; June 16, 2011.
 '42 **Calkins, Myron D.**; September 15, 2011.
 '61 **Esvelt, Larry A.**; April 25, 2011.
 WV A '51 **Marsh, J. Myron**; August 23, 2011.
 WI A '46 **Sakols, D. James**; September 23, 2011.
 '49 **France, Richard H.**; September 18, 2011.
 '50 **Busby, Edward O.**; October 12, 2011.
 '67 **De Vor, Richard E.**; July 26, 2011.
 WI B '41 **Entringer, Ray A.**; April 2011.
 '45 **Risley, G. Frank**; September 27, 2011.
 '50 **Reddy, Joseph L.**; February 18, 2010.
 '69 **Leissner, William R.**; July 31, 2010.
 '70 **Sobczak, Nancy L.**; no details.
 ΣT A '54 **Vest, Glenn E.**; February 27, 2011.

LONG-TERM CARE EDUCATION

Because more than 60 percent of members age 65 and over will need some type of long-term care, it's wise to know options. A Long-Term Care Outreach and Education Program for members and families is offered through LTC Financial Partners. Learn more at — ltctbp.com.



ALUMNUS NOTES

Arizona Alpha

David J. Soukup, P.E., '76, who served as managing director of ASME's former centers sector, will now lead the governance area as managing director, governance, and will report to John D. Venneri, general counsel. Soukup served as Assistant Secretary-Treasurer of Tau Beta Pi during 1976-84.

Arizona Beta

Bridget A. Moorman, '85, has been promoted to colonel in the U.S. Air Force Reserve and is now senior reservist supporting the MILSATCOM system program office in Los Angeles, CA. In her civilian job, she is president of BMoorman Consulting, LLC, providing clinical engineering for both medical-device interoperability and remote monitoring. She also chairs the board of examiners for certification in clinical engineering.

Arkansas Alpha

Morris S. Arnold, '65, is a senior-status judge of the United States Court of Appeals for the Eighth Circuit. A Republican, he was nominated to the appeals court by President George H. W. Bush in 1992, assuming senior status in 2006. Arnold was judge for the U.S. District Court for the Western District of Arkansas during 1985-92.

Rebecca A. Logsdon, '09, was named by the American Society of Agricultural and Biological Engineers as recipient of the 2011 Robert E. Stewart engineering humanities award for academic accomplishments and creativity to help



change the world. Logsdon is a Ph.D. student in the ecological sciences and engineering graduate program in the agricultural and biological engineering department at Purdue University.

California Eta

Dr. Norman F. Schneidewind, '86, is professor emeritus of information sciences at the Naval Postgraduate School. He is a fellow of the IEEE and completed an IEEE USA congressional fellowship in the U.S. Senate in 2005. Dr.



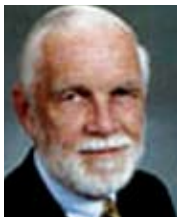
Schneidewind has worked on issues in homeland security, cyber security, defense, nuclear safety, information technology, space, and telecommunications.

Connecticut Beta

John L.C. Lof, '38, is still helping his *alma mater* well into his 90s. He worked as a professor and director of the University of Connecticut's computer center for 30 years. Now he is giving back with a \$1 million dollars bequest, which is equal to the sum total of his retirement benefits. The university plans to use the funds "to improve the vitality of graduate education."



Dr. Lee S. Langston, '59, is a professor emeritus of mechanical engineering at the University of Connecticut. He joined the school in 1977 after a decade in engineering positions with Pratt & Whitney Aircraft. With expertise in



heat transfer, fluid mechanics, and thermodynamics, his research on turbine-blade cascade/interactions, known collectively as the "Langston cascade," is widely regarded. He is a fellow of ASME.

Dr. Robert F. Leheny, '60, is assistant director, information technology systems division, at the Institute for Defense Analyses in Alexandria, VA. He was previously deputy director of the Defense Advanced Research Projects Agency after working for 25 years with Bell Communications Research.



Delaware Alpha

Dr. Robert C. Wetherhold, '74, professor of mechanical and aerospace engineering at the University at Buffalo's school of engineering and applied sciences, has been named a fellow of the American Society of Mechanical Engineers. This recognized his achievements in solving design problems by exploiting the unique symmetry properties of composites and their useful behavior in laminated structures.

Indiana Alpha

Mark N. Obergfell, '80, has joined Coastland Civil Engineering in Santa Rosa, CA, as supervising engineer. His 30 years of experience will apply to the design and construction of municipal projects, including transportation, drainage, and buildings.

Massachusetts Beta

Dr. Burton S. Kaliski Jr., '84, has joined Verisign, Inc., as senior vice president and chief technology officer. After completing his Ph.D. at MIT in 1988, Burt joined the RSA Data Security startup out of MIT. In 2006, RSA was acquired by EMC Corporation, and Burt became founding director of the EMC innovation network. Verisign was spun out of RSA and provides internet services. Burt and his wife **Michele, NY Δ '85**, met as graduate students at the institute.

Missouri Beta

Thomas R. Voss, P.E., '69, received the distinguished service award from the NSPE's professional engineers in industry interest group at its 2011 annual meeting in Las Vegas. He is president, CEO, and board chairman of the St. Louis, MO, based energy group Ameren.



science journalism from the American Geophysical Union for a cover story on climate change. Dan was a 2007-08 Nieman fellow at Harvard.

New Jersey Gamma

Martin Dvorin, '58, is an engineer and retired professor of optical technology living in Novato, CA. His career encompassed work at Bausch & Lomb, Inc., and teaching at a community college where he served as dean of engineering technologies. He later was chief scientist for Optical Sciences Group of Petaluma, CA.

Pennsylvania Eta

George J. Pierson, '84, is president and CEO of Parsons Brinckerhoff, a New York-based global firm assisting clients to design, construct, and operate critical infrastructure. He joined the company in 2006 as general counsel and secretary. The firm began in 1885. **William B. Parsons, NY A 1879**, whose earliest projects included the original IRT line of the New York City subway that opened in 1904, was co-founder.



Tennessee Beta

Dr. Zoran Vukic, '87, is a professor in the department of control and computer engineering at the University of Zagreb in Croatia and heads its laboratory for underwater systems and technologies. Dr. Vukic was a Fulbright fellow and visiting professor at Vanderbilt University.

Virginia Alpha

Karl R. Kahsar, '10, has won the overall triathlon title at the age group national championships in Burlington, VT. "Rudy" earlier won the collegiate national championships, becoming the first athlete to win both titles in the same year. He is studying chemical engineering as a graduate student at the University of Colorado at Boulder.



Ohio Epsilon

William C. Easterday, '97, has joined the research and development team of Uster Technologies in Knoxville, TN, as a senior mechanical engineer. The firm manufactures instruments for quality measurement and certification in the textile industry. He has experience in product development and the design of both industrial machinery and molecular imaging equipment.

Ohio Eta

Dr. Constantine H. Houppis, '47, is professor emeritus at the Air Force Institute of Technology, and his 15th textbook *Wind Energy Systems: Control Engineering Design*, of which he is a co-author, will be published in January 2012 by Taylor & Francis. The firm has requested that he and his co-author publish a 6th edition of their book entitled *Linear Control System Analysis and Design with Matlab*, which has been translated into Portuguese Spanish, and Chinese. Including the predecessor to this book, *Feedback Control System Analysis and Design*, published in 1960, his text is still in use after 51 years.

South Dakota Alpha

Tricia Mohrhauser Schwallier, '98, District 12 Director, and **Curtis D.**



Gomulinski, MI E '01, were married on December 31, 2010, in Roseville, MI. Thirteen

Tau Beta Pi members attended the wedding and 15 members attended the January reception in Denver, CO.

Virginia Beta

Camille M. DaDamio, '11, was named the 2011 Virginia Tech undergraduate woman of the year. The *magna cum laude* graduate in industrial and systems engineering works as a program ergonomist at the GM technical center in Warren, MI.



Pennsylvania Beta

Daniel C. Vergano, '90, is a science reporter at *USA Today*, where he has worked since 1999. Previous reporting stints included *Medical Tribune* and *HealthWeek* (PBS). He won the 2006 award for excellence in

Tennessee Alpha

Dr. Mark E. Dean, '79, is currently chief technical officer for IBM Middle East and Africa. He is an IBM fellow and was previously a vice president overseeing the company's Almaden Research Center in San Jose, CA. An inductee in the National Inventors Hall of Fame, he led the team that developed the ISA bus and the design team that created the one-gigahertz processor chip. He holds three of IBM's original nine PC patents.



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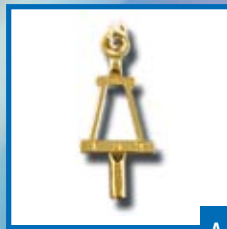
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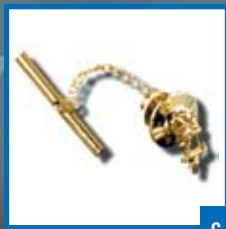
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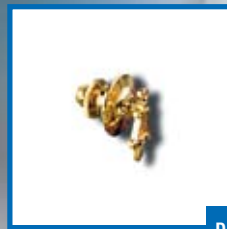
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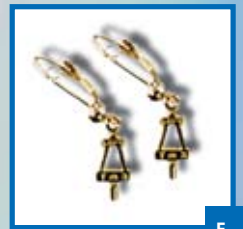
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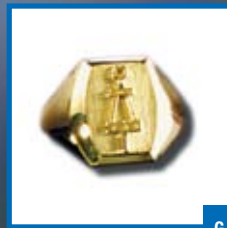
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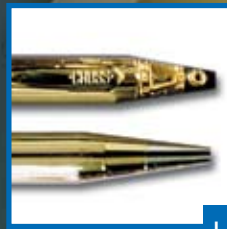
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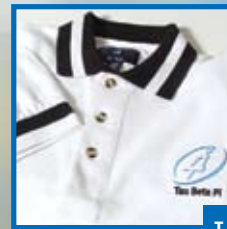
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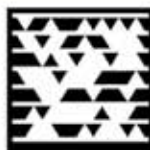
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