THE BENT

OF TAU BETA PI The Engineering Honor Society Summer 2020

Building Innovations for a Better Built Environment

Meet the 2020 TBP Fellows

The Bent of Tau Beta Pi
The Engineering Honor Society

Summer 2020
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Features

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Images from Bruce King's A New Carbon Architecture feature, including bioMASON bricks and the Metropol Station in Seville, Spain.
Cover artist: Dali Polivka

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Tau Beta Pi was founded at Lehigh University, South Bethlehem, Pennsylvania, on 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 and Trademark Office. Member, American Society for Engineering Education; co-founder Association of College Honor Societies; and Affiliate, American Association for the Advancement of Science.

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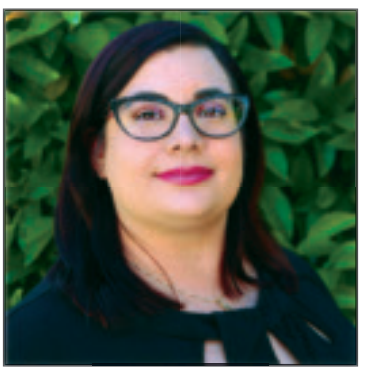
Perseverance through Change & Failure



Imagine standing at the edge of a ledge, your toes curled against the warmth of the stone beneath your feet, staring at the dark water below. Are there rocks lurking beneath the surface? What if the water is cold? What if you belly flop instead of swan dive? Or worse, what if you fall and everyone sees?

The fear of change and failure can hold us back from new opportunities and personal growth. Throughout our lives, we will encounter numerous situations that affect our careers and personal lives. Sometimes a change will have immediate positive benefits for us and is easy to make. Other times, it may not be clear which path to take or to identify what consequences may await. Regardless of the situation, each time it presents us with a choice. Do we stay with the solid, familiar thing or take the opportunity presented? We can work to mitigate some risks and plan ahead, but we also need the right mindset to approach change in order to succeed. Worrying about failure can consume us, limiting our ability to make forward progress. It can prevent us from making changes especially when under pressure. Our mindset, as we approach a challenge, is an essential element in how we prepare, react, and plan for the next step.

I'd like to share my own journey struggling with failure. Last October, I took the civil engineering P.E. exam for the third time. After failing the first time, I felt that I was a failure who wasted three months studying, only to have to repeat the process. I did not want to discuss the exam with anyone, and my self-confidence took a significant hit. When I failed the second time, I knew I had to change my approach because the additional time I spent studying did not achieve the result I desired. I sought advice from colleagues, friends, and coworkers on how I could improve. Not once did anyone tell me I was a failure — in fact, they all encouraged me and reminded me that many famous people failed repeatedly but kept working until they were successful. When I self-identified as being a failure, I was essentially focusing on my feelings rather than improving. I needed to analyze what could be changed in my approach and implement it. Like an athlete training to improve their performance, I needed to identify my areas of deficiency and focus on those areas of study to better prepare myself. When I received notice that the results were ready, I had a back-up plan already in place for how to prepare to take the exam again. This is a critical piece of strategy by planning how to react to failure, I kept my mindset that I was training to meet a goal. I passed the exam on my third attempt, and fortunately didn't need to utilize the plan. This experience was a reminder that we have to work hard to achieve our goals and that sometimes our goals take multiple steps.

As I write this, the Tau Beta Pi Association is operating to meet the challenges of the COVID-19 pandemic. The Executive Council (EC) and HQ staff are working diligently to ensure we meet the needs of the Association. Headquarters received numerous emails and questions from members regarding concerns about COVID-19. In early March, the EC and Program Directors discussed the possible impacts to Association chapter activities. The EC made the difficult decision to cancel the remaining District Conferences, Engineering Futures Sessions, and provided direction that collegiate chapters should follow guidance of their schools regarding in-person activities. At the time, our response was amongst the first to cancel in-person activities. As the month progressed, additional news came that schools were cancelling all in-person activities and local governments soon followed with social distancing orders.

The Executive Council, HQ, and Program Directors anticipated that initiations would be severely limited, cancelled, or postponed due to social distancing restrictions. Our collegiate chapters faced a crisis that without initiations of new members, they would risk a lack of continuity in chapter membership and leadership. Director of Rituals Ed D'Avignon, working with input from the EC and Executive Director Curt Gomulinski, tailored an online initiation ritual and script to provide to our collegiate chapters. The virtual ceremony maintains the spirit and secrecy of the in-person ritual. It is intended for a single initiation class with a limited time frame.

The end of March saw the HQ staff making the transition to work from home as they continue to serve the Association. The EC is meeting regularly via teleconferencing to work together on Association business and to address concerns as they arise. We have started a new social media campaign to share positive videos submitted by members and posted on Wednesdays. To learn more about the project, contact us at *media@tbp.org*.

ΤΒΠ is standing at a point in time where there are many changes in front of us and action must be taken to meet those challenges. Together, we will approach them as opportunities to grow and develop both ourselves and the Association. With the right mindset, each step we make together is one step closer to our goal. We may need to adapt our approach as we find obstacles, but we will do it together, and we will succeed.

Rachel K. Alexander, E.I.T.
California Upsilon '15
ΤΒΠ Secretary, CA Upsilon Advisor
Assistant Engineer II
Sacramento County Department of Airports

Making an Abrupt Left Turn

The COVID-19 pandemic has drastically changed our society. Some of us have personally been diagnosed with COVID-19 or know someone who tested positive; many of us have been struggling without work, adapting to a work from home environment, or facing the challenge of being deemed essential employees; and all of us have been adjusting to social distancing, grappling with limited interpersonal interactions, and learning every online meeting solution under the sun. COVID-19 has impacted Tau Beta Pi Headquarters (HQ) operations including the interactions with and support of our collegiate chapters.

As Secretary Alexander notes in her Council's Corner, HQ shifted to working from home in March. Fortunately, several changes to our operations over the past decade facilitated this, mostly, seamless transition:

- Implementing Google Apps for Nonprofits in 2012 enhanced our ability to collaborate with one another and our volunteers using Gmail, Drive, Groups, Sites, and most recently, Hangouts Meet.
- Employing a Major Gifts Officer in 2013 to work remotely required us to shift our mindset to provide the capability to access Headquarters' tools and systems outside our physical office using VPN software.
- Switching to an IP-based phone system in 2017 provided the flexibility for staff members to continue to answer the office phones from their cell phones at home.

Of course, there were bumps along the way, but I am pleased that HQ was able to shift from an all in-office environment to an all work from home operation in less than a week. We have continued to provide outstanding customer support to our chapters and members during this transition.

One of the challenges noted by Secretary Alexander was initiating new members into Tau Beta Pi during the pandemic. I am pleased to report that, to date, 118 chapters have initiated 1,566 new members with the new online initiation ceremony. While well below our normal spring numbers, numerous chapters have postponed their new member initiations to the fall while another 50 chapters have yet to hold their ceremonies or finalize their initiation paperwork.

Another issue facing chapters this term was the collection of initiation fees. While many chapters use PayPal, Venmo, or other online tools, a survey conducted in mid-March told us two thirds of chapters collect initiation fees by check or cash. Given the inability to collect fees in person, HQ implemented a new system through the TBP store to allow candidates to pay their fees directly to HQ. The chapter portion is then credited to the chapter's account or disbursed to the chapter on request. This new capability has been extremely popular with many chapters, and we are looking at tools to provide this to chapters in future terms.

In order to provide additional support to collegiate chapter leaders, we implemented a special Google Site (*www.tbp.org?resources*) and conducted our first "Chapter Chats" in April. The new resources page provides regularly updated documents and messages as well as a discussion board and information about the online initiations. The "Chapter Chats" reached over 125 chapter leaders and Association Officials and provided information about the status of Tau Beta Pi, the Online Initiation Ceremony, and tips for operating a chapter in an online world. These popular sessions will be continued over the summer to provide training and information to our new chapter leaders to aide them in operating their chapters this fall.

While the pandemic has created pain, suffering, and challenges for many across the country and world, I am heartened to see how the members and leaders of Tau Beta Pi have turned some of these challenges into opportunities to improve the Association. In addition to what I have highlighted above, I have been thrilled to see numerous virtual "happy hours" conducted by chapters across the country, District 16 leading a Picnic Lecture Series on Saturdays at 1 p.m. PT (email district16@tbp.org for info), and the first ever national Tau Beta Pi Trivia Night in May. We are finding many new ways to engage and support one another! Be sure to check *www.tbp.org/memb/alumni.cfm* to stay abreast of upcoming alumni events.

I hope all of you continue to stay safe and healthy as the country continues to re-open and adjust to this ever-changing situation. If you are interested in engaging with us through any of these new virtual avenues, email me at curt@tbp.org.

Until later,

Executive Director Curtis D. Gomulinski
Michigan Epsilon '01

The Bent welcomes letters from readers regarding recent articles or relevant matters of interest. Letters should be sent to dylan@tbp.org or Tau Beta Pi, P.O. Box 2697, Knoxville, TN 37901-2697. Please include your full name, ΤΒΠ chapter, and class year. Unfortunately, we cannot acknowledge or respond to all letters that are submitted. Letters may be edited for length and clarity. Thank you!

"Mysterious Errors" of the Bond Chronometric Expeditions

I just read with great interest your article on chronometers. But I am left a bit puzzled after repeatedly reading the section on "Mysterious Errors." It implies that the source of the difference between east & west readings was the temperature variation – however, unless I somehow missed it, I don't see that conclusion explicitly stated. Could you please clarify?

Charles E. Morris, M.D., MD B '81

[Response from author ***Trudy Bell****:*

Thank you for your kind response and for pointing out the omission. Yes, during the series of voyages undertaken in summer 1855 during the special thermometric expedition, the comparison of the regular marine chronometers with Bond's specially designed chronometer without temperature compensation convinced William and George Bond that the cause of the east-west discrepancy was due to certain temperature variations.

The real authority on the 1855 expedition is retired USNO astronomer Richard E. Schmidt – acknowledged several places in my article – who has intensively researched it and is preparing a paper that will discuss it to at least some degree, for publication this summer (COVID-19 not interfering).

[Response from ***Richard Schmidt****:*

Charles Morris asks an interesting question regarding the "Mysterious Errors" of the Bond chronometric expeditions. By 1851, William Bond recognized that the eastward and westward voyages differed by nearly three seconds of time in the measure of the span of longitude across the Atlantic, and in 1851 this difference grew slightly. As the transatlantic voyages lasted about 13 days, this amounted to a rate error of about 1/10th second per day, round trip. The rate of a chronometer varies as the square of the difference between its actual temperature and its compensation temperature. Thus, a chronometer may gain in its daily rate either when its temperature is higher than, or lower than, its compensation temperature. Until the 1855 expedition, Bond had no complete records of the temperatures at sea of each of the chronometers. During the winter months, he noted that the east-west difference could amount to as much as 5 or 6 seconds for particular chronometers, telling Hartnup that he "found many of them going rather wild at extreme cold."

As longitude increases going westward and decreases going eastward, the effect of a given rate error applies with reverse sign between the eastward and westward voyages, so there is no mystery about that, but only about the amount of the accumulated clock error at sea. Bond's use of the "thermometric chronometer" on the 1855 voyages produced the data he needed to calculate individual clock errors at sea, providing in effect the continuously accumulated temperature errors of rates. This, and the fortuitously milder seasons of 1855, removed the "mysterious errors" seen in prior years.

Chronometric Expeditions

Trudy, I want to thank you so much for your most interesting article.

I read every word. I'm very interested in marine chronometers and sextants.

I own four older sextants and a modern plastic one. I really appreciate the workmanship of the older instruments.

Leland P. Scott, MS A '62

North American Prime Meridian

I just finished reading your article and would like to have your full list of references. I read "Longitude" several years ago, but did not know until reading your article that the Harvard College Observatory was considered the prime meridian for North America at one point. I am a Harvard grad, and lived on the Radcliffe Quad, just down the hill from the observatory, for the last year and a half of my academic tenure there.

I contacted one of my classmates, Steve Willner, who is an astronomer at the Harvard Smithsonian Astrophysical Observatory, to ask him if the transit circle mentioned in the article is still there. He said it is long gone, but there is still the foundation of what must have been a reference point for the transit circle directly north of the observatory.

Jeffrey D. Gerken, OH Δ '76

Thank You Note

After going through the spring 2020 issue, I was absolutely thrilled to see the great update article on the Chapter Endowment Initiative, including mentions of OH Epsilon's full endowment, as well as OH Alpha's and OH Delta's challenge matches. Thank you, Sherry!

Next, the wonderful story about the late Stanley Korzep's full endowment of the Cleveland State Univ. chapter was excellent. It will mean so much to alumni, current OH E and Ohio's North Coast Alumni Chapter (ONCAC) members in the Cleveland area! Well done all!

I then remembered being asked to do a short thank you note about the Judy and Ron Pasadyn Endowed Scholarship for engineering students at CSU. What a pleasant and humbling surprise to see a full-page note about that scholarship, including a scary photo of yours truly. This also means a lot to both myself and the local members (OH A, E, K, and L, plus the ONCAC members), as it will encourage all of us to step up and to do similar good things for our local student chapters.

Finally, the photo of our new ONCAC officers was appreciated!

Ed D. Basta, OH E '82

Sangeeta N. Bhatia, M.D., Ph.D., *Rhode Island Alpha '90*, has been elected a Fellow of the National Academy of Medicine. A professor of engineering and health sciences & technology at MIT, her research includes developing micro- and nanoscale technologies to improve human health and treat diseases, including cancer. She has also founded biotechnology companies to further these technologies.

Ramalingam Chellappa, Ph.D., *Indiana Alpha '81*, has been awarded the 2020 IEEE Jack Kilby Signal Processing Medal "for contributions to image and video processing, especially applications to face recognition." Chellappa is a Distinguished University Professor, electrical and computer engineering at the University of Maryland. He received M.S. and Ph.D. degrees in electrical engineering from Purdue University.

Paul D. Dapkus, Ph.D., *Illinois Alpha '66*, has been awarded the 2020 IEEE Jun-ichi Nishizawa Medal "for the development of metal organic chemical vapor deposition and quantum well lasers." Dapkus is Chair and Distinguished Professor of Engineering at the University of Southern California. He obtained his B.S. degree in engineering physics from the University of Illinois at Urbana-Champaign.

Jen-Hsun Huang, *Oregon Alpha '84*, has been awarded the 2020 IEEE Founder's Medal "for visionary leadership of NVIDIA and the development of GPU fueling the Artificial Intelligence revolution." Huang founded NVIDIA in 1993 and has served since its inception as president and CEO. He holds B.S. and M.S. degrees in electrical engineering from Oregon State University and Stanford University, respectively.

Leah H. Jamieson, Ph.D., *Indiana Alpha '74*, has been awarded the 2020 IEEE James Mulligan Jr. Education Medal "for contributions to the promotion, innovation, and inclusivity of engineering education." The medal is the highest honor bestowed for achievement in education. She is a Distinguished University Professor of Engineering at Purdue and former dean of engineering (2006-17).

Asad M. Madni, Ph.D., *California Epsilon '69*, has been elected to the European Academy of Sciences and Arts and elected to Honorary Fellowship by the Royal Aeronautical Society (U.K.). He is a Distinguished Adjunct Professor at UCLA and retired President & CEO of BEI Technologies, Inc. He was initiated as a ΤΒΠ eminent engineer (2008) and was ΤΒΠ Distinguished Alumnus (2014).

James S. Peery, Ph.D., *Texas Delta '84*, has been named the 16th Director of Sandia National Laboratories, the country's largest national laboratory. Peery, who began his career at the Labs in 1990, previously served as associate laboratory director of National Security Sciences at Oak Ridge National Laboratory in Tennessee and holds a doctorate in nuclear engineering from Texas A&M University.

H. Vincent Poor, Ph.D., *Alabama Alpha '72*, has been awarded the Benjamin Garver Lamme Award from the American Society for Engineering Education, honoring more than four decades of contributions to engineering education. He served as Princeton's dean of engineering from 2006-16 and is currently interim dean and professor. Poor's B.S. and M.S. degrees are in electrical engineering from Auburn University. He is a ΤΒΠ Distinguished Alumnus (2005).

Tau Beta Pi Fellows for 2020-21

RECIPIENT	CHAPTER	FIELD OF ADVANCED STUDY	FELLOWSHIP
Mariia (Masha) Alibekova	CO A '18	Bioengineering	Record No. 26
Lauren V. Bartels	LA B '18	Environmental Engineering	Record No. 23
Subash Bhandari	KS B '20	Biomedical Engineering	Tau Beta Pi No. 830
Kevin M. Blum	IN A '13	Biomedical Engineering	Centennial No. 35
Christian R. Bolander	UT Γ '18	Mechanical Engineering	Anderson No. 16
Prerak Chapagain	LA E '19	Electrical & Computer Eng'g	Swalin No. 4
Emily K. Chase	TN Z '20	Chemical Engineering	Fife No. 228
Erika M. Chelales	LA B '18	Biomedical Engineering	King No. 59
Francisco D. Chitty Gozalo	FL Θ '19	Civil Engineering	Matthews No. 23
Arielle Marie R. Gamboa	NJ B '19	Mechanical Engineering	Stark No. 41
Kevin P. Greenman	MI Γ '19	Chemical Engineering	Williams No. 41
B.Volkan Gurses	GA A '20	Electrical Engineering	Forge No. 9
Eleanor G. Henson	AR A '20	Environmental Engineering	Fife No. 227
Jesse J. Hinricher	SD A '17	Materials Science & Eng'g	Record No. 21
Nicholas A.G. Johnson	NJ Δ '20	Operations Research	Nagel No. 23
Maria Kelly	NM B '18	Chemical Engineering	Record No. 25
Ryan E. Kelly	TN A '20	Aerospace Engineering	Hennis No. 1
Shreedevi Kumar	FL A '17	Biomedical Engineering	Record No. 28
Kevin H.Y. Leung	CA Λ '16	Biomedical Engineering	Dodson No. 7
Luke D. Neise	TN B '20	Aero. & Astro. Engineering	Record No. 24
Alexander T. Nguyen	KY A'20	Electrical Engineering	GEICO No. 5
Denislav P. Nikolov	CA N '20	Mechanical Engineering	Fife No. 226
Kendra K. Noneman	ID Γ '20	Computational Neuroscience	Spencer No. 65
James Obute	KY A '20	Chemical Engineering	Zimmerman No. 9
Abimbola E. Oluwade	DC A '20	Mechanical Engineering	Anderson No. 15
Jesse Schimpf	ID Γ '20	Materials Science & Eng'g	Fife No. 230
Kirk P. Smith	OK B '17	Electrochemical Engineering	Record No. 22
Robert W. Streeter	WY A '11	Electromagnetics	Sigma Tau No. 46
Erica K. Wagner	MA E '20	Bioengineering	Fife No. 229
Reed M. Yalisove	MI Γ '20	Materials Science & Eng'g	Record No. 27

The Fellowship Board has announced the selection of 30 engineering students from 408 applicants for graduate fellowships in 2020-21. All of this year's recipients will receive cash stipends of $10,000 for advanced study.

More than $7,600,000 in stipends will have been given by the Society when this 87th group of fellows completes its graduate work. All Tau Beta Pi Fellowships are awarded on the competitive criteria of high scholarship, campus leadership and service, and promise of future contributions to the engineering profession.

All fellows are members of Tau Beta Pi and may do their graduate work at any institution they choose. These awards bring the total to 1,706 fellowships granted since the program was inaugurated in 1929.

This year's recipients will study various fields of engineering, including five biomedical, four each in chemical and mechanical, three materials science and engineering, two each in bioengineering, electrical, and environmental.

The others have chosen to study aeronautics & astronautics engineering, aerospace engineering, civil engineering, computational neuroscience, electrical and computer engineering, electrochemical engineering, electromagnetics, and operations research.

The **Anderson Fellowships** are named for Mabel E. and Marshall Anderson, *MI Γ'32*, who was ΤΒΠ Fellow No. 19 and left a bequest to the Society in 2005.

Given for the 35th time, the **Centennial Fellowship** honors the Society's most outstanding fellow and commemorates Tau Beta Pi's 100th anniversary.

The **Dodson Fellowship** is sponsored by the late Charles R. Dodson, *MD B'30*, who made a gift to the Association in 1998.

The five **James Fife Fellowships** are presented in memory of the father of the late member William Fife, *CA A 1921*.

The **Forge Fellowship** is named for Charles O. Forge, *CA Γ'56*, who left a bequest in 2010.

The **Hennis Fellowship** is awarded for the first time thanks to a generous gift from Lee A. Hennis, *CA Δ'65*, to continue mentoring young engineers.

The **Harold M. King Fellowship,** awarded for the 59th time, honors the 1954-58 president of ΤΒΠ, Harold M. King, *MA A 1910*, and is given to that recipient whose participation in his/her technical society is judged worthy of special mention.

The **Matthews Fellowship** is awarded in honor of R.C. "Red" Matthews, *IL A 1902*, who served as Secretary and Secretary-Treasurer from 1905-47 and as Secretary-Treasurer Emeritus in 1947-78.

The **Nagel Fellowship** is given in honor of Robert H. Nagel, P.E., *NY Δ'39*, for his service as Editor and Secretary-Treasurer from 1942-82, and as Secretary-Treasurer Emeritus in 1982-97.

The **Record Fellowships** are awarded commemorating Leroy E. Record, *KS A'29*, whose generous bequest will provide earnings to support awards in perpetuity.

The **Sigma Tau Fellowship,** given for the 46th time, perpetuates the name of Sigma Tau, a national engineering honor society founded at the University of Nebraska in 1904 and merged with Tau Beta Pi in 1974. It also commemorates Sigma Tau's former national president and secretary-treasurer, Clarel B. Mapes.

The **Charles H. Spencer Fellowship** is given for the 65th time. Named for Tau Beta Pi's national president from 1936-47, Charles H. Spencer, *IL B 1913*, it is awarded to that recipient whose contributions to his/her collegiate chapter are judged worthy of commendation.

The **Donald A. Stark Fellowship** is supported by a gift from a charitable trust named for the man who contributed much to progress in the fluid-power industry.

The **Swalin Fellowship** is named in honor of Helen M. and Richard A. Swalin, Ph.D., *MN A'52*. Dr. Swalin and his wife left a bequest in 2015 to support TBP scholarships and fellowships.

The **Tau Beta Pi Fellowship** is supported by matching gifts from companies as part of the annual alumni giving.

The **Edward H. Williams Jr. Fellowship,** awarded for the 41st time, honors the founder of Tau Beta Pi. It is given to a recipient who plans to earn a doctoral degree and become a professional engineering teacher, as was Dr. Williams, *PA A 1875*.

The **Zimmerman Fellowship** is named for Marlin U. Zimmerman Jr., *MD A'44*, who left a bequest in 2010.

The **GEICO Fellowship** is supported through a partnership with GEICO Insurance.

With the large number of applicants, the Fellowship Board engages the services of additional members to review and rank applicants. The Board used this information to make the final Fellow selections in April. The Association is grateful to these members for their role in the selection process. Reviewers and volunteers are listed at www.tbp.org/fellowships.cfm.

Tau Beta Pi
The Engineering Honor Society

Record Fellow No. 26

Mariia (Masha) Alibekova

Masha is an M.D./Ph.D. student at the University of Pennsylvania. She conducts research in bioengineering focusing on a novel single-cell proteomics tool to study cell decisions in development and disease. Masha hopes to stay in academia alongside practicing by starting her own tissue and organ regeneration lab; she aims to advance science and use that knowledge to help her patients in dire need of innovative research. Masha, a Jack Kent Cooke Scholar, graduated *magna cum laude* in chemical and biochemical engineering from Colorado School of Mines where she served as CO Alpha Chapter service chair. She engaged in research in her sophomore year in analytical chemistry. Later, she found her passion at the intersection of medicine and engineering and spent most of her free time working in a hematology lab studying a promising novel therapy for strokes. Prior to Mines, Masha graduated with an A.S. in engineering science from Bergen Community College and was involved as VP of STEM club, VP of fellowship of her PTK society chapter, and a STEM tutor.

Record Fellow No. 23

Lauren V. Bartels

Lauren graduated *summa cum laude* from Tulane University in 2018 with a B.S. in chemical engineering. She competed on the NCAA Div. I cross country and track & field teams as one of the top long distance runners in Louisiana, and was named the 2017-18 AAC Cross Country Female Scholar-Athlete of the Year. She also served as LA Beta Chapter secretary and chemical engineering chair of Theta Tau, while actively volunteering with Tulane's Food Recovery Network. After graduating, she accepted a competitive two-year fellowship with the Science and Technology Policy Institute, where she conducts rigorous critical infrastructure and community resilience policy analyses for the White House Office of Science and Technology Policy. As an NSF Graduate Research Fellow, Lauren will pursue her M.S. in environmental engineering and hydrology at the Univ. of Nevada, Reno, researching sustainable water systems and practices in a policy-relevant context. Her professional goal is to analyze and inform water management policies at a local or regional level to promote resilient water systems.

Tau Beta Pi Fellow No. 830

Subash Bhandari

Subash is majoring in biomedical engineering with a minor in chemistry at Wichita State University. He is from Nepal and is the first in his family to attend college. Subash works as an undergrad research assistant in the WSU BioME Lab and tutors biomedical classes at GEEKS. He has been a part of many research papers and conferences starting his freshmen year. He is a recipient of the $7,000 semester and summer NIH KINBRE (Kansas Idea Network for Biomedical Research Excellence) and $5,500 NIH-KINBRE STAR TRAINEE Award. He is working to develop a non-invasive and wearable biosensor for the diagnosis of melanoma cancer. He was recognized with the 2020 College of Engineering Outstanding Graduating Senior Award. He serves as an executive member for the KS Beta Chapter, Biomedical Engineering Society, Nepalese Student Association, and Wichita State table-tennis team. Subash is a varsity table-tennis athlete and a proud Shocker fan. His career interests include obtaining a Ph.D. in biomedical engineering and contributing towards the field of academia.

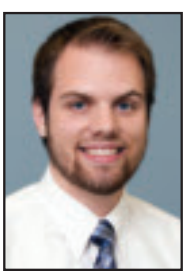
Centennial Fellow No. 35

Kevin M. Blum

Kevin graduated with honors from Purdue University with a B.S. and M.S. in biomedical engineering and a minor in psychology. Kevin performed research in microfluidics under Dr. Bumsoo Han, and graduate research on collagen-based biomaterials with tunable mechanical properties under Dr. Sherry Voytik-Harbin. He also worked as a product discovery intern at COOK Medical's MED Institute developing medical devices. Kevin has held leadership roles with the Biomedical Engineering Society, University Dance Marathon, and the American Physician Scientist Association. Kevin is an M.D./Ph.D. candidate at The Ohio State University, studying biomedical engineering under Dr. Christopher Breuer at the Center for Regenerative Medicine at Nationwide Children's Hospital. His research focuses on the creation of regenerative medicine strategies for the treatment of congenital heart disease and how tissue engineering products can develop into functional tissues within the body. Kevin will pursue a career as a physician-engineer with the goal of bridging the gap between research, industry, and the patient's bedside.

Anderson Fellow No. 16

Christian R. Bolander



Christian is pursuing a doctoral degree in mechanical engineering at Utah State University, where his research focuses include supersonic aircraft sonic boom mitigation and bio-inspired aircraft design and analysis. He has worked with individuals from groups such as NASA, Boeing, Texas A&M, and the Air Force Research Lab. He looks forward to graduating in 2022 and pursuing a position as a research faculty member before entering academia in hopes of continuing his research and acting as a mentor to future engineers. He was initiated into the UT Gamma Chapter in 2016 and served as president during the 2017-18 school year. He has enjoyed his ΤΒΠ experience immensely and it has offered him numerous opportunities for growth and development as an engineer. He wishes to thank his family, including his wife, Beth, and two children, Emma and James, for their constant support of his educational pursuits.

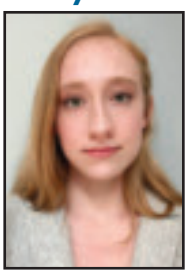
Swalin Fellow No. 4

Prerak Chapagain

Prerak, a native of Nepal, graduated from the University of New Orleans (UNO) with a major in electrical engineering and a minor in actuarial mathematics in May 2019 with university high honors. He was the only person in his class to graduate with a perfect 4.0 GPA in the college of engineering making him top of the engineering class at UNO. He is a 2018 ΤΒΠ Scholar, Phi Kappa Phi Fellow, and was also named royalty after winning the Homecoming King title at UNO. He was president of IEEE, LA Epsilon Chapter vice president, and of Toastmasters at UNO. He was also involved in the student government, honors council, Nepalese student association, and as an Ambassador at UNO. He is pursuing graduate studies at the University of Illinois at Urbana-Champaign (UIUC) with a focus in power systems. As a research assistant at UIUC, his duties involve researching the integration of renewables in the power system to assess the stability, reliability, and cybersecurity implications.

Fife Fellow No. 228

Emily K. Chase



Emily graduated *summa cum laude* from the University of Tennessee at Chattanooga with a B.S. in chemical engineering. She was a William E. Brock Scholar in the UTC honors college. In addition, she has held leadership positions in the UTC chapter of American Institute of Chemical Engineers and the ChemE Car team. For the past two years, she has been working to complete her departmental honors thesis, which focused on the synthesis and characterization of graphene foam as a thermal additive. She has completed an NSF Research Experiences for Undergraduates (REU) at the University of Kentucky, where she studied the interactions of lignin dimer grafted particles with lipid bilayers. She also completed an REU at the Georgia Institute of Technology, where she studied the growth modes of FCC metals nanoparticles on palladium seeds. Emily will be pursuing a Ph.D. in chemical engineering at Northwestern University.

King Fellow No. 59

Erika M. Chelales

Erika graduated *summa cum laude* with a B.S.E. in biomedical engineering and a minor in Spanish from Tulane University. In addition to her academic pursuits, Erika was named student athlete of the year when she was on the cross country and track teams at Tulane. She is an NSF Graduate Research Fellow pursuing a doctoral degree in biomedical engineering at Duke University. Her research focuses on the development of a low-cost ablation method as a drug delivery mechanism for use in low resource settings. Also, Erika is passionate about teaching. She is completing the Certificate in College Teaching and plans to pursue a career in academia and research as a professor. Erika is an executive member of the TBP Research Triangle Alumni Chapter and serves as vice president and events coordination officer. She organizes social networking, student advising, and alumni outreach events. Erika is also an active member of her community and advocates for children petitioned into the NC court system as a Guardian ad Litem volunteer.

Matthews Fellow No. 23

Francisco D. Chitty Gozalo

Francisco graduated from the Universidad Catolica Andres Bello in Venezuela with a B.S. in civil engineering in 2014. He graduated from Florida International University with an M.S. in civil engineering in 2016 and is currently pursuing a Ph.D. in civil engineering structures. During his master's studies, Francisco worked with collected data about people's behavior during evacuation environments, and studied evacuations applying multi-scale methods for agent-based simulations. As a Ph.D. candidate, he is working on the development of a modified design detail for a standardized slab-beam bridge superstructure, which utilizes ultra-high-performance concrete joints between beams to accelerate construction times. He is the ACI student chapter president, chair of the ASCE-SEI graduate student chapter, and secretary of Chi Epsilon at FIU. In 2018, Francisco and colleagues founded an NGO called American Association of Venezuelan Engineers, which offers a networking hub for Venezuelan and other Latin American engineers in the U.S. Ultimately, he plans to make a significant knowledge contribution in bridge infrastructure.

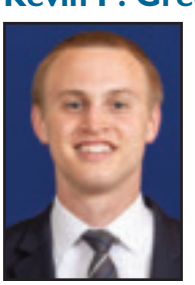
Stark Fellow No. 41

Arielle Marie Gamboa

Arielle earned her B.S. (2019) and M.S. (2020) in mechanical engineering at Rutgers University, where she was elected the NJ Beta Chapter president for 2017-18. She was committed to improving her chapter's service efforts by increasing community involvement and strengthening the MindSET K-12 program. Arielle also served as secretary of ASME and vice president of the Rutgers mechanical and aerospace engineering student association, where she led the peer mentoring, outreach, and social media programs. She conducted research in the hybrid micro/nanomanufacturing lab, working on projects focused on thermocapillary dewetting and electrospray deposition for rapid fabrication and materials processing. Her thesis combined these techniques to develop a method to direct electrospray using dewetted insulating templates. She then shifted her focus to using electrospray deposition to control the morphology and chemical structure of hybrid sol-gel films. Arielle will begin her Ph.D. in mechanical engineering at UIUC, where she will study interfacial fluid mechanics and heat transfer in the energy transport research lab. She plans to pursue a career in academia.

Williams Fellow No. 41

Kevin P. Greenman



Kevin graduated *summa cum laude* from the University of Michigan with a B.S.E. in chemical engineering, minor in mathematics, and concentration in materials science and engineering. As an undergraduate, he conducted computational research on the properties of nitride semiconductors that resulted in a first-author publication. He also developed a new tool for computational research and education on catalysis while working at Purdue University. Kevin served as an instructional aide in fluid mechanics for two years. As a senior, he led the development of the computational curriculum for a new undergraduate chemical engineering class and co-authored a publication discussing a novel approach for integrating research into undergraduate curricula. His involvement in ΤΒΠ included terms as professional development officer and president of the MI Gamma Chapter, and was a 2018 ΤΒΠ Scholar. Kevin is pursuing a Ph.D. in chemical engineering and computation at MIT. He ultimately aspires to a career in academia to make a positive impact through teaching, mentorship, and research.

Forge Fellow No. 9

B. Volkan Gurses

Volkan graduated from the Georgia Institute of Technology with a B.S. in electrical engineering. In the low-frequency (LF) radio group at Georgia Tech, he developed an unprecedentedly sensitive remote sensing instrument, which has formed the basis of a global LF receiver network. In the Georgia Tech electronics and micro-system lab, he devised novel approaches to design integrated mm-Wave ultra-compact passive structures and mm-Wave/sub-THz frequency-reconfigurable hybrid couplers, for which he was awarded the 2020 IEEE MTT-S undergraduate-pregraduate scholarship. He also served as editor-in-chief of *The Tower Undergraduate Research Journal* and held leadership positions on the board of student publications and student activities board for undergraduate research. Volkan was the recipient of the 2020 Georgia Tech ECE Undergraduate Research Award, 2020 IEEE-HKN Innovation Scholarship, 2020 Radio Club of America Scholarship, and 2017, 2019 Georgia Tech President's Undergraduate Research Awards. Volkan will pursue a Ph.D. at the California Institute of Technology as an EAS Division Fellow and will pursue a career in academia.

Fife Fellow No. 227

Eleanor G. Henson

Eleanor graduated with honors distinction from the University of Arkansas with a B.S. in biological engineering, an environmental engineering concentration, and a minor in sustainability. As an undergraduate, Eleanor worked at the Arkansas Water Resources Center as a research assistant, which led to publishing an article in the *Journal of Agrosystems, Geosciences & the Environment* (August 2019) on phosphorus cycling in streambed sediments. She simultaneously conducted research as an Arkansas Department of Higher Education Student Undergraduate Research Fellow evaluating the hydrologic impact of an on-campus green roof. She was selected as the College of Engineering Outstanding Senior and one of the top 10 female graduates from the Univ. of Arkansas. She was awarded a nationally competitive Fulbright Research Award in Canada and will begin her master's degree in environmental engineering at Colorado State University in the fall. Eleanor is passionate about sustainable practices concerning hydrologic resources and envisions herself finding a career in research and academia.

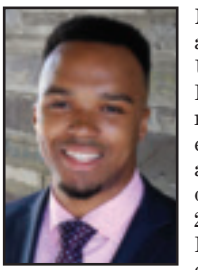
Record Fellow No. 21

Jesse J. Hinricher

Jesse graduated from the Massachusetts Institute of Technology in 2019 with a B.S. in chemical engineering and a minor in chemistry. As an undergraduate, he worked in Professor Fikile Brushett's lab researching novel chemistries for redox flow batteries, a promising grid-scale energy storage technology. Inducted into ΤΒΠ at the South Dakota School of Mines and Technology before he transferred to MIT, Jesse serves as MA Beta Chapter student advisor, xFair co-director, and volunteer co-chair. He completed an NSF Research Experiences for Undergraduates at Princeton University and internships at the NASA Kennedy Space Center and PLANT PV, a solar technology startup. He is pursuing a Ph.D. in materials science and engineering at MIT where he joined Professor Jennifer Rupp's group and is researching solid-state electrolytes for next-generation batteries. Based on his life changing experiences at PLANT PV, Jesse has hopes of founding his own startup focused on advanced battery technology industry.

Nagel Fellow No. 23

Nicholas A.G. Johnson



Nicholas will graduate from Princeton University with a B.S.E. in operations research and financial engineering in June as the Valedictorian of Princeton's Class of 2020. He served as NJ Delta Chapter president in 2019. Johnson's research has focused on sequential decision making under uncertainty, optimization, and the ethics of algorithmic decision making systems. His thesis focused on developing high performance, efficient algorithms to solve a network based optimization problem that models a community based preventative health intervention. As a junior, Nicholas developed a machine learning system to more robustly anonymize datasets than existing alternatives. He previously interned at Oxford University's integrative computational biology & machine learning group, developing a novel optimization technique, worked as a machine learning engineer at Google in summer 2019, and has previously interned at the Montreal Institute for Learning Algorithms. He will intern as a quantitative developer at the D. E. Shaw Group during summer 2020 before beginning Ph.D. studies in operations research at MIT.

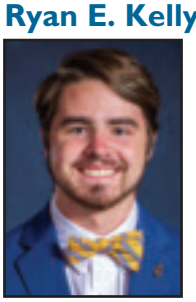
Record Fellow No. 25

Maria Kelly

Maria graduated *summa cum laude* from the University of New Mexico with a B.S. in chemical engineering and concentration in materials processing and served as NM Beta Chapter corresponding secretary. Maria is motivated by research in renewable energy technology and spent three years at Sandia National Labs developing new catalysts for fuel cells and studying alkaline rechargeable batteries. This work resulted in five co-authored publications, and she plans to pursue similar research in electrochemistry as an NSF Graduate Research Fellow. Outside of the lab, Maria is passionate about supporting women in engineering and encouraging girls to pursue STEM careers. She served as the treasurer and president of UNM's SWE section and has helped plan several STEM outreach activities with local Girl Scout troops. Maria will pursue a Ph.D. in chemical engineering at the University of Colorado at Boulder, where she plans to continue volunteering in her community through ΤΒΠ and SWE. After her Ph.D., she hopes to join the research staff at a national lab.

Hennis Fellow No. 1

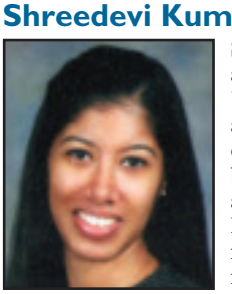
Ryan E. Kelly



Ryan graduated *summa cum laude* from the University of Tennessee Knoxville with a B.S. in aerospace engineering and a minor in mathematics. He worked as an undergraduate teaching assistant for three years and has participated in undergraduate research studying graphene quantum dot technology, fracture mechanics, and synthetic turbulence modeling. His senior year, Ryan served as TN Alpha Chapter vice president and welcomed 50 new members to the chapter. He will be pursuing a Ph.D. at the University of Texas at Austin using computational fluid dynamics to study how to delay turbulence in low-speed incompressible flows. Ryan has a passion for teaching and research, so his career goal is to be a professor at a prominent university. In 2019, he was also a ΤΒΠ Scholar and AIAA Scholarship Award recipient. In his free time, Ryan likes to relax by playing video games and guitar.

Record Fellow No. 28

Shreedevi Kumar



Shreedevi graduated from Cornell University with a B.S. in chemical engineering and a business minor. As a researcher in the Putnam lab, she investigated lipid microparticles for encapsulation of a hydrophobic dye. Following graduation, she worked as a strategy and operations consultant at Deloitte Consulting, primarily in the healthcare and biopharmaceuticals sectors. She returned for her Ph.D. in biomedical engineering, specializing in biomaterials and regenerative medicine, at University of Florida. Shreedevi's doctoral research focuses on drug delivery vehicles with therapeutic payloads that are site-specific and targeted at different inflammatory pathways in osteoarthritis. She is the recipient of a UF Graduate School Preeminence Award, a Pittman Institute Fellowship, and is a co-inventor on a patent. She served as FL Alpha Chapter vice president and vice president of electees. Shreedevi plans to continue focusing on the use of biomaterial properties and cell-material interactions for delivery of drugs being translated into in vivo mechanistic studies and therapeutic evaluation.

Dodson Fellow No. 7

Kevin H.Y. Leung

Kevin graduated with highest honors from the University of California, Davis, with a B.S. in biomedical engineering (BME). Kevin performed research in developing nanoparticle imaging probes resulting in two co-authorship publications. He developed a point-of-care medical device to measure blood coagulation in trauma patients for his senior design project which received the Sandia Engineering Design Award from Sandia National Labs and the UC Davis BME Dept. Distinguished Achievement & Highest Innovation Award. He was a 2014 ΤΒΠ Scholar. Kevin is pursuing a Ph.D. in BME at Johns Hopkins University, where his research focuses on medical image analysis. His works include developing machine learning (ML) methods for tumor localization, segmentation, and classification in cancer patients, and for prediction of outcome and disease detection in Parkinson's disease patients. These works were presented at international academic conferences and resulted in a first-author journal publication. Kevin plans to pursue a career as a scientific researcher to develop ML algorithms for clinical applications.

Record Fellow No. 24

Luke D. Neise

Luke is graduating from Vanderbilt University with a perfect GPA and a double major in mechanical engineering and classical civilizations. During his senior year, he served as TN Beta Chapter president. The majority of his work as an undergraduate has been with the Vanderbilt Aerospace Design Laboratory (VADL); as the payload lead for VADL, he worked with a small team to investigate and demonstrate how air-based drone sampling missions could allow for more challenging, inaccessible extraterrestrial environments to be better accessed and studied. This coming fall, he will begin his pursuit of both M.S. and Ph.D. degrees from Stanford University in the aeronautics & astronautics program. Supported by an NSF Graduate Research Fellowship, he plans to study dynamics/controls for spacecraft or space robotics and go on to work on the next generation of in-space engineering challenges.

GEICO Fellow No. 5

Alexander T. Nguyen

Alex graduated from the University of Kentucky with a B.S. in computer engineering and minors in mathematics and computer science. He was elected as KY Alpha Chapter vice president and selected as a 2019 ΤΒΠ Scholar. Throughout undergrad, he held various leadership positions with Alpha Phi Omega AZ chapter and UK Alternative Service Breaks on top of summer internships with Lexmark International, Inc. Alex will attend the University of Texas at Austin as an M.S./Ph.D. student in integrated circuits and systems with broad interests in circuit design for energy efficiency, machine learning, and security. His future aspirations are to work in industry research and development and later bring industry connections with him to the academic setting.

Fife Fellow No. 226

Denislav P. Nikolov

Denislav will graduate from Cal Poly Pomona with a B.S. in mechanical engineering and a minor in mathematics. He was a 2019 ΤΒΠ Scholar and served as CA Nu Chapter vice president and student council representative. He has been involved with various campus organizations, including the engineering student council, martial arts sports club, and the National Association of Engineering Student Councils. He performs research at Cal Poly Pomona exploring the mechanics and materials science of vertebral fractures to better understand the effects of bone disease. Additionally, he has performed summer research at the University of California, Santa Cruz, studying bioelectronics, and at the University of Michigan, studying the biochemical composition of mineralized tissue and its mechanical properties. He has also worked on engineering projects with NASA JPL and Safran. Denislav will begin pursuing a Ph.D. in mechanical engineering at the University of Michigan. After graduation, he hopes to make a meaningful impact in the field of tissue mechanics.

Spencer Fellow No. 65

Kendra K. Noneman

Kendra graduated from Boise State University with a B.S. in materials science & engineering and an applied mathematics minor. She participated in a wide array of internships and research endeavors with the NASA Ames Research Center, Applied Materials, Carnegie Mellon Univ., and the computational materials engineering lab at Boise State. Her research interests include data science, modeling, statistical mechanics, and self-assembly. Kendra served as ID Gamma Chapter president, chaired a committee at the 2019 ΤΒΠ Convention, and was honored as a ΤΒΠ Laureate for her dedication towards engineering and athletics. Kendra is also an NCAA Div. I track & field athlete where she competes in the hammer throw. Next up, she will move to Pittsburgh, PA, to pursue a Ph.D. in neural computation and machine learning from Carnegie Mellon. She hopes to eventually work as a project manager in the private research industry, using quantitative models to understand the great complexities of neurobiological systems.

Zimmerman Fellow No. 9

James Obute

James graduated *summa cum laude* with a B.S. in chemical engineering from the University of Kentucky (UK), where he served as KY Alpha Chapter president. He also re-established the UK energy club and was an active member of the American Institute of Chemical Engineers, the National Society of Black Engineers, and the student government association. James was a dedicated researcher and received fellowships to work at Washington Univ. in St. Louis and MIT. At these schools, he worked on developing and understanding advanced materials for energy storage devices such as supercapacitors and redox flow batteries. For his scholastic achievements and service to the University of Kentucky, James was given the Outstanding Junior in Chemical Engineering Award and the Joseph P. Kennedy Philanthropy Award. In the fall, he will attend the University of Texas at Austin to pursue a Ph.D. in chemical engineering. James plans to continue working on material science & energy research, pursue a career in academia, or become an entrepreneur.

Anderson Fellow No. 15

Abimbola E. Oluwade

Abimbola was born in Lagos, Nigeria. He graduated *summa cum laude* with a B.S. in mechanical engineering from Howard University, where he served as DC Alpha Chapter recording secretary. He also served as a mentor for the chapter's MindSET program, mentoring K-12 students in preparation for the 2019 First Lego League Robotics Competition. At Howard, Abimbola studied the effects of Re and Ri numbers on flow reversal and heat transfer in heated rectangular ducts with an aim to improve the design of solar collectors for developing countries, co-authoring a conference paper in the process. Abimbola has had research internships at SLAC and Fermi National Accelerator Laboratories. At SLAC lab, he won the best poster award for developing a novel X-ray reconstruction algorithm for the LCLS XTCAV diagnostic system. Abimbola is passionate about employing computational tools in modeling and designing components such as solar collectors, airfoils, and heat exchangers, and will obtain a Ph.D. in fluid mechanics and thermal processes. He intends to remain in academia as a researcher and educator.

Fife Fellow No. 230

Jesse Schimpf

Jesse graduated *summa cum laude* from Boise State University with a B.S. in materials science & engineering and minors in physics and computer science. He served as ID Gamma Chapter treasurer and conducted research all four years of his degree in surface characterization. He became a co-author his sophomore year for work characterizing electropolished titanium and niobium. Jesse has contributed to a wide range of research, including corrosion-resistant coatings, DNA cross-tile and triangular nanostructures, solid electrolyte interfaces in batteries, pore-forming proteins for targeted drug delivery, and mechanical responses of mesenchymal stem cells. Through the lab, he participates in STEM outreach activities for local schools and STEM clubs. Jesse plans to attend the University of California, Berkeley, for a Ph.D. in materials science and engineering. There, he will research materials for sustainable, efficient energy production, because they are essential in enabling future technological advancement. After school, he hopes to continue this research at a national lab or university.

Record Fellow No. 22

Kirk P. Smith

Kirk, a Ph.D. candidate in Professor Charles Monroe's group at the University of Oxford, works on nonaqueous redox flow batteries. His thesis work aims to clarify the performance tradeoffs inherent in electrochemical reactors that use porous separators instead of ion-exchange membranes and demonstrate the utility of this design choice in benchtop-scale flow batteries with novel electrolyte formulations. A Rhodes Scholar, University of Tulsa graduate (B.S., mechanical eng'g '17), and captain of Tulsa's NCAA Div. I cross country team, he is broadly interested in (photo)electrochemical and mechanical engineering as they apply to grid-scale energy storage and power-to-X technologies, he strives to accelerate the transition to a clean energy economy through his technical research while advocating for policies that enable fair competition between energy technologies. Kirk plans to help establish an academic/industrial research consortium that focuses on replacing petrochemical processes with their electrochemical counterparts and is actively seeking collaborators for this effort.

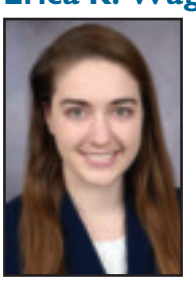
Sigma Tau Fellow No. 46

Robert W. Streeter

Rob graduated from the University of Wyoming with B.S. degrees in electrical and computer engineering and an M.S. in electrical engineering. His research at UW focused on analog signal processing and biomimetic vision sensor design. Following graduation in 2013, Rob spent time as a research engineer at the U.S. Air Force Academy, where he helped develop a decentralized, distributed, and robust decision-making algorithm for small UAS task allocation. He then returned to Wyoming to join a small technology firm focusing on land-mobile radio systems. Rob worked to expand the business to include commercial UAS operations. He also joined the volunteer fire department and rural ambulance service. In 2017, Rob was selected to join the winter-over team at the Amundsen-Scott South Pole Station as a science support engineer. After nearly 13 months at the South Pole, Rob returned to academia at the Univ. of Colorado at Boulder to pursue Ph.D. studies in RF and electromagnetics. Teaching and inspiring young engineers is his passion, and he looks forward to joining academia as faculty.

Fife Fellow No. 229

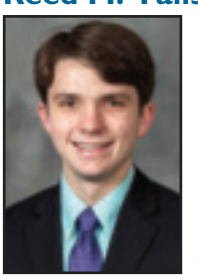
Erica K. Wagner



Erica graduated *summa cum laude* from Northeastern University with a B.S. in bioengineering and a minor in entrepreneurial engineering. Starting freshman year, Erica became heavily involved in research resulting in numerous publications and presentations. She received grants to research biomaterials for drug delivery to target low back pain and she developed a chemical conjugation technique that can be used to crosslink collagen for tendon and ligament repair for her capstone project. She also completed two co-ops where she discovered antibodies targeting the complement component 3 pathway at Visterra Inc. and differentiated human induced pluripotent stem cells into muscle tissue in the Pourquie Lab at Brigham and Women's Hospital. For excellence in research, she was awarded a 2019 Goldwater Scholarship. She is also a member of SWE, the Biomedical Engineering Society, and was a teaching assistant for the college of engineering for two years. Erica will pursue her Ph.D. in bioengineering at Cornell University. She plans to pursue a career conducting research in the field of biomaterials and tissue engineering.

Record Fellow No. 27

Reed M. Yalisove



Reed graduated from the University of Michigan with a B.S.E. in materials science & engineering with minors in math and physics. Since joining the MI Gamma Chapter in 2017, he has served in several leadership roles, including president and vice president. Reed's undergraduate research at Michigan focused on creating an analytic model of information collection in electron tomography to characterize materials in 3D at the atomic scale. In the summer of 2018, Reed worked in the chemical and biomolecular engineering department at Cornell University as an NSF REU participant. Reed will continue his electron microscopy research as he pursues a Ph.D. in materials science and engineering at the University of California, Berkeley, as an NSF graduate research fellow. After completing his Ph.D., Reed hopes to pursue a career in research at a university or a national lab so that he may continue the STEM outreach that he enjoyed as an undergraduate. Reed also enjoys hiking, backpacking, and running with the Michigan running club in his free time.

CAPTION CONTEST

GET CREATIVE AND SEND US your finest caption(s) for this photo from the Winter 1981 *Bent* archives. If yours is one of the judges' favorites, and you *have not* been a previous winner, we'll send you a ΤΒΠ t-shirt of your choice.

This issue's contest image, right, was taken at the 1980 Convention in Tulsa, OK. Wanting to stand out in a crowd, the District 4 delegates, led by Director Russ Werneth, *MD B '64*, center, "capped off" the Convention in a distinctive way.

Submit your entries to pat@tbp.org or mail them to HQ by Monday, August 3, 2020.

Thanks again for the captions and congratulations to the winners. Keep the clever captions coming!

All 41 entries, including captions and results from recent contests, can be viewed online at: *www.tbp.org/pubs/captionContest.cfm*

TELL US YOUR TAKE ON THE TALE... WIN A T-SHIRT!

In the Spring 2020 contest photo, left, which first appeared in the Winter 1981 issue, Patrick R. Turner, *MI B '81*, and Michigan Beta advisor Gary P. Agin, Ph.D., *KS A '63*, attempt to locate themselves in the group photo of the 1980 Convention held in Tulsa, OK. Our panel of judges worked with 41 entries from 27 different members, and the winners are:

1) "HMM... SO WHERE'S WALDO?"
from a previous winner, Yi-Hsien Doo, P.E., *MI Z '81*.

The remaining, who are all first time winners, will recieve a t-shirt!

2) "I'M SURE I CAN FIND MYSELF. I REMEMBER I WAS STANDING BEHIND THE WOMAN."
Janet L. Schexnayder, Ph.D., P.E., *LA A '87*

3) "IN 2020 YOU WILL LOOK LIKE THAT OLD GEEZER AND I WILL PROBABLY BE DEAD!"
Steven P. Catanich, *CA R '83*

4) "DON'T WORRY, PAT. I SPENT THE BETTER PART OF MY CAREER TRYING TO FIND MYSELF."
Alec G. Richrdson, *PA L '87*

Send your graduation images to *media@tbp.org*, we'll post them.

A New Carbon Architecture

By: **Bruce T. King, P.E.,** *Colorado Beta '78*

> This would be easy if it weren't so hard.
> —Yogi Berra

Recently I was driving in America and pulled up at a stop light behind a Tesla. You know Tesla, right? The latest and most talked about electric car, renowned for its power, handling, and just overall coolness. I drove one once and can attest: it was great!

This particular Tesla had a license plate that read ZEROCARB — meaning, presumably, that the owner was proud of his zero carbon emissions car. No climate villain here! There's no way to know for sure, but I'd guess that this owner believed his claim, believed that his driving had no effect on the climate, unlike the rest of us bozos in our gas-powered stinkers.

Bruce T. King

As I sat there pondering behind that license plate, I was thinking what you maybe thinking: "Huh?" Because that Tesla doesn't get recharged by twinkle fairies, and didn't appear by magic in the world — and neither do ovens or shoes or buildings. By some estimates the energy required to make a smartphone, just for one example, is more than 70 times the energy it takes to charge it for a year — not to mention all the waste products, water, and emissions of many sorts that are involved. There is work and energy and rearrangement of some stuff into other stuff to make a Tesla — or a building. To believe otherwise is ignorance, to pretend otherwise is disingenuous and even somewhat dangerous. That Tesla moment sparked me to focus even more on the so-called *embodied or up front carbon* of buildings, and on the many emerging technologies that will turn buildings from climate villains (which they now very much are) into climate champions that can safely store carbon that was soaked out of the air: imagine a building made of sky.

> *The primary task of any good teaching*
> *is not to answer your questions,*
> *but to question your answers.*
> *—Adyashanti, The Way of Liberation*

As long as we're imagining, imagine:
Walking into a brand new building and immediately sensing that something is different. The structure is all exposed wood — columns, beams, even floor and roof are all great curving slabs of timber elegantly joined together from smaller pieces. The skin and insulation, which you can also see, are straw bound into shapes that shed rain and insulate walls. The foundation is soil from the site transformed by invisible microbes into strong concrete to hold everything up, and the warm, leatherlike floors need no additional covering. It should look and smell like a barn but doesn't, and feels more like an inviting bedroom or an elegant museum. It's nicer than any building you've ever been in before.

And it's not a handmade house in the woods — it's a new downtown office building, nine stories high, full of people, and filling half a city block. It gathers all the power and water it needs, is elegantly lit by daylight, and processes all of its own water and wastes into soil for the courtyard gardens. And, though you can't see this, compared to what might have been built a decade earlier, its construction put thousands of tons less carbon into the air — and pulled thousands more tons out of the air to serve as its walls, floors, and roof.

The New Carbon Architecture: buildings made of sky. For the first time in history, we can and should build pretty much anything out of carbon that we coaxed from the air. We can structure any architectural style with wood, we can insulate with straw and mushrooms, we can make concrete — better concrete — with clay, microbes, smoke, and a careful look in the rearview mirror and the microscope. All of these emerging technologies and more arrive in tandem with the growing understanding that the so-called *embodied carbon* of building materials matters a great deal more than anyone thought in the growing movement to halt and reverse climate change. The built environment can switch from being a problem to a solution. (And it doesn't really matter whether or not you accept that climate change is anthropogenic: all the technologies of a new carbon architecture make sense for a host of reasons, not least that they are much nicer buildings to occupy, and just happen to pull carbon out of the air.)

But to back up a bit . . .

Human beings started building about eight thousand years ago with the dawn of the agricultural revolution, and that extended worldwide moment was arguably the most disruptive in history for us and the rest of life on Earth. Rather than hunt and forage about the landscape for our food, we grew it in one spot, and next thing you know there was architecture, political states, wealth and poverty, Gutenberg and Einstein, global tension, Lady Gaga, and drive-thru WiFi-enabled hamburger stands in Cairo.

And billions more of us.

We've been developing the art and science of building for these thousands of years, mostly learning from trial and error, but as of the last few centuries also learning and developing via science. We know an awful lot more about how things work than we ever did, but can also dimly see how much we still don't know, such as what most of the universe is made of.

Speaking of what things are made of, in many ways the history of architecture follows the development of materials — the history of people messing around with things they found in the landscape to get bricks, then boards, then toilets, then building-integrated photovoltaic roofing tiles. People learned to fire clay to make pottery and bricks, and when the kilns were made of limestone they discovered that the intense heat also changed the rocks: lime plaster, concrete, Pantheon. In some places the potters saw shiny metal come oozing out of certain heated rocks: copper, bronze, iron, Golden Gate Bridge. Two hundred years ago, the predecessors of modern structural engineers in England placed iron bars in newly invented Portland cement concrete, and architects went wild like they never could before: the Sydney Opera House and every downtown skyline in the world with lights, plumbing, and comfort hundreds of feet in the air. In some places people saw oil oozing out of the ground, then drying to tar: vinyl siding and the interstate highway system, not to mention plywood and air conditioning. And so on. Seems like the party would never stop, but of late the many large and hidden costs have come due, and we have to change not just the way we build, but what we build *with*.

Every modern industrial society has codified systems and materials of construction that are based on abundant fossil fuels, and on having an "away" where we can throw things. All the laws, standards, and codes are still rigidly based on doing things that way, even penalizing and inhibiting those who seek better ways to build. For the past century, it has been increasingly easy and cheap to extract, process, assemble, and transport everything we use in construction, but that won't last much longer. The climate is definitely changing, and the effects are arriving harder and faster than we expected even ten years ago. The "heat, beat & treat" approach to making and processing materials is killing us, as is the notion that we can throw anything we want into landfills, water, soil, or air, because building materials account for about 10 percent of global carbon emissions and 25-40 percent of solid wastes. That just has to change. We have a new ball game.

Some of us who design and build have lately started noticing that nature builds all sorts of things, and has been doing so for the four billion years of life on Earth. She has a hell of a head start on the trial-and-error path; maybe we can and should peek over her shoulder and see if we can't cheat a bit. How does a mussel build its shell? How do spiders spin their webs? How does a redwood tree stand and remain very much alive at 120 meters — and why doesn't it grow higher? How do birds stay warm and dry at night?

When facing design challenges from the small (How can I illuminate a surface or keep out rain?) to the large (Can nine billion human beings live on Earth without wrecking everything for themselves and the other critters, maybe even be a welcome presence?), we might ask: *What would Nature do?*

Some simple and semi-obvious things come right to mind: Nature runs on solar and geothermal energy with no other external energy inputs, and Nature uses what is at hand either by growing it like a clam grows its shell, or harvesting nearby resources as birds do for their nests. She doesn't bake rocks, ravage landscapes, or poison air and water to get shelter for her citizens. There's no FedEx, there's no power grid, there are no artificial chemicals to worry about.

Metropol Station in Seville, Spain. Image courtesy of Arup.

Wood structure + straw insulation – the Europeans are leading the way. Image courtesy of EcoCocon.

But you and I live in a highly interdependent industrial society, where the sudden disappearance of FedEx, the power grid, a huge multitude of problematic chemicals, and all the other trappings large and small of modern life, would make for a whole lot of suffering for a whole lot of people. We've built a better life for more and more of us, but at the same time made quite a mess, so can we clean it up? Can we wean ourselves off of the fossil fuel habit? This ship doesn't turn very fast, but can we plot a course to a world that works for everybody?

Sure. Technologically, we're scarily clever creatures. It took less than two and a half years between Franklin Roosevelt authorizing the Manhattan Project and the first atomic explosion in the New Mexico desert (for better or worse). It took only eight years between John Kennedy's proclamation and Neil Armstrong's foot stepping onto the Moon's surface. And both of those projects were designed and executed by men and women using slide rules, unreliable wire telephony, and computers far less powerful than the average laptop of today. When we collectively set ourselves to do something, for better or worse, we tend to get it done. Of late, there's been plenty of the better but also far too much of the worse. How about let's change that, and get more better and less worse.

We can already see a path to a fantastically better built environment, a new palette of materials for a new century. "Net Zero" buildings that use less energy than they generate are a good start, but don't go nearly far enough. Imagine buildings that not only protect people but also heal the damage done to the world around us. Imagine buildings and cities made of sky, a New Carbon Architecture.

What kind of difference might this make? Various and multiple studies assign to building materials 5 to 15 percent of global emissions, there being no consistent methodology nor data sets to draw from. Call it 10 percent of global emissions, and there's your impact. We propose to reduce that number to zero — and then beyond by a new "carbon positive" architecture that builds with the carbon enticed from sky. We are in technological reach, within a generation, of a global construction industry that is not only "Net Zero," generating more energy than it needs to operate, but in its materials pulls more carbon out of the air than it puts up. We can reverse the emissions engine that construction now is.

The materials of architecture are not the only component of climate-friendly design, much less of climate work writ large. But we do want to make clear that carbon sequestering architecture is an essential component among the many emerging technologies and strategies for climate *cooling*, from energy to transportation to agriculture to waste management to water. In particular, we have a keen eye on agronomy and the study of soils, and all the gazillions of amazing little creatures therein, for it's starting to look like that's where we will find real wealth and the wisdom to grow food, clothing, and shelter in fantastic, lovely, and healthy new ways — not to mention sequester stupendous amounts of carbon.

It's a whole new and lovely, not to mention essential, ball game. Most of this article was written before the COVID-19 pandemic of 2020, and is here being amended from the middle of the worldwide lockdown of March/April, when we don't know how bad the damage will be to people or economy, not to mention political freedoms or stability. By the time you are reading this, you know more about that than anyone knows now. But one thing is certain: COVID-19 will run its course while the climate keeps cooking to the detriment of every human being and most every other living creature on Earth. The task before us is clear and will be with us for our lifetimes even as other emergencies, no matter how large or compelling, come and go. We are each called from our own personal stories to take an active part in the unfolding of the global story of humanity. It's one hell of a time to be alive!

A word about "Carbon"

I know you believe you understand
what you think I said
but I'm not sure you realize
what you heard is not what I meant.
—Richard Nixon

Carbon. It's a good thing. Right up there, Number 6 in the periodic table, and one of the most common elements on Earth. Carbon is here because a very, very long time ago uncounted millions of first-generation stars created it by nuclear fusion in their cores, then offered it by supernova explosion to the universe. Along with all sorts of other elemental fusion dust, it floated around, eventually to condense by gravity into planets and the world we know. And, as many have noted, it is the party animal of elements: it loves to bond with things like nitrogen, iron, hydrogen, and oxygen to make all sorts of interesting delights such as giraffes, redwood trees, poodles, and you. You read these words with carbon eyes, and hold this book with carbon hands. Please enjoy; not every blob of stardust gets to be conscious for a brief few moments under the sun and run around on a lovely planet with all sorts of other delightful carbon blobs. Congratulations, you lucky dog!

Carbon is a good thing, but too much of anything in the wrong place becomes pollution, or even poison. A new carbon architecture is but part of the effort to reverse the increase of gaseous carbon in the air, which is disrupting the climate in ways that we can't fully predict, and so far mostly don't like. So we enthusiastically join the growing conversation for climate solutions, but must first be clear about the terms we use. *Carbon* is bandied around a lot, but people often mean slightly different things by it.

Carbon and carbon dioxide (CO_2), for example, are two different things, though they get interchanged quite a lot in climate conversations. The fraction of carbon in carbon dioxide is the ratio of weights: the atomic weight of carbon is 12 atomic mass units, while the weight of carbon dioxide is 44 because it includes two oxygen atoms that each weigh 16.

You switch from one to the other with this formula: one ton of carbon is equivalent to 44/12 = 3.67 tons of carbon dioxide. (Methane, or CH_4, another major greenhouse gas with 86 times the warming potential of CO_2, has an atomic weight of 16, so the ratio is less pronounced: a ton of carbon in your building equals 16/12 = 1.33 tons of methane in the air.) Plants like straw (about 35-50 percent carbon) or softwoods (about 50 percent carbon) *sequester* (that is, durably store) carbon by absorbing carbon dioxide and releasing the oxygen.

They feed us oxygen with their respiration, and we oxygen-breathing creatures feed them CO_2 with our respiration. Cool deal, huh? A ton of carbon in the forest or field — or as part of a building — represents or simply is 3.67 tons of carbon dioxide absorbed from the air.

Also, following convention, we sometimes use CO_2e to denote carbon-*equivalent* emissions from carbon and other gases such as methane, calibrated according to each one's *global warming potential* (GWP) because some gases have ten or a hundred or even thousands of times the heat-trapping effect of carbon dioxide.

Finally: *embodied energy* and *embodied carbon*. Be warned that terms like *zero energy* (aka ZE), *net zero energy* (aka NZE), *zero net energy* (ZNE) are all increasingly tossed about in loosely interchangeable ways in conversation around building energy efficiency. Even more confusing, their close cousins *zero carbon* and *zero net carbon* are also appearing more frequently. This is a rather complex matter in itself, as terms change meaning with scale (product, building, community, nation, or globe?), with grid efficiency (coal, hydro, nuclear, wind? etc.), time frame (daily, annualized, or lifetime?), and other factors. Generally, those terms move in tandem; that is, though the units for measurement are different, they rise or fall roughly in parallel. (Sometimes they do diverge, as when products are manufactured with electricity from a coal-dependent grid vs. a hydropowered grid.) The growing consensus is that zero carbon (vs. zero energy) should be our societal goal across all industry, and so we must develop a *carbon positive architecture* defined by more carbon sequestered than is ever emitted.

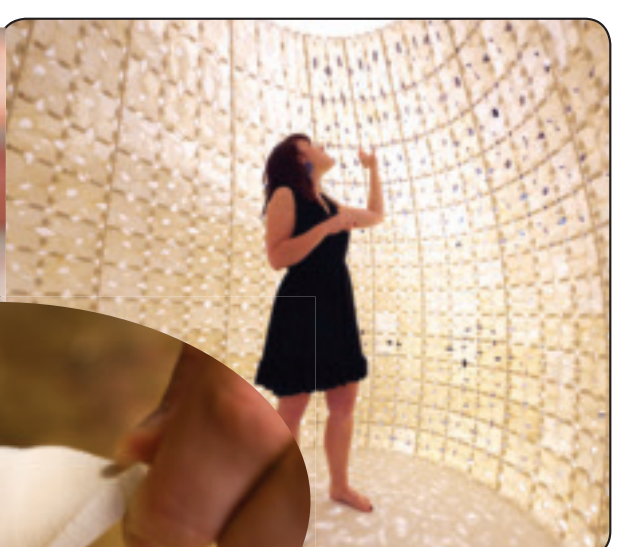
A few thoughts on carbon, written by a lump of carbon for other lumps of carbon, on how to build carbon shelter to protect us from a sometimes hostile carbon planet.

Shall we dance?

Excerpted from "The New Carbon Architecture" *by Bruce King, New Society Publishers, 2017. A registered structural engineer with 30 years of private consulting experience and 25 years of leadership in the green building movement, Bruce has served as a Green/Clean Tech advisor to numerous startups, worked on high-rise structures in San Francisco, and passive solar designs all over the world. He has lectured and taught ecological building practices in international settings and is co-founder and Director of Ecological Building Network (EBNet) a non-profit coalition of engineers, builders, and architects developing and disseminating best technologies for the built environment He is also co-founder of Green Building Press, a small publishing enterprise and author of three books.*

(Above)
bioMASON makes bricks using only enzymes from natural bacteria. Image courtesy of bioMASON.

(Right)
Flexibility of Ecovative mushroom insulation. Image courtesy of Ecovative.



(Above)
"Saltygloo" – an igloo made of 3-D printed salt. Image courtesy of Rael-San Fratello Architects.

Why do we call it a ... Farad?

By: **Lyle D. Feisel, Ph.D., P.E. (Ret.),** *Iowa Alpha '61*

This is the seventh in a series of articles that explore the history of science and engineering. One way in which this history has been preserved is in the names of the scientific units that we commonly use. Those units will serve as starting points for these articles as we explore "Why do we call it a...?"

Clearly, the men and women who populate the history of science and engineering were all very intelligent and talented and they all made significant contributions to our understanding of the physical world. Choosing any one individual who stands out among such an illustrious group is a difficult task, but, if forced to do so, I would choose Michael Faraday, whose long career covered more than half of the 19th century.

To my knowledge, Faraday (1791-1866) is the only person for whom two physical units were named. One, the faraday or faraday constant is — per Encyclopedia Britannica — equal to the amount of electric charge that liberates one gram equivalent of any ion from an electrolytic solution. That is equal to the charge of Avogadro's Number of electrons or roughly 96,485 coulombs. The unit was named the faraday in recognition of Faraday's contributions to the science of electrolysis, which we will explore further in a bit.

The second unit named for Faraday is the farad, his name with the last two letters removed. Interestingly, the farad was proposed as a unit of charge in 1861, but was soon adopted for its current use, a unit of capacitance. By definition, a one farad capacitor charged to one volt will have, on each plate, one coulomb of charge, positive on one plate, negative on the other.

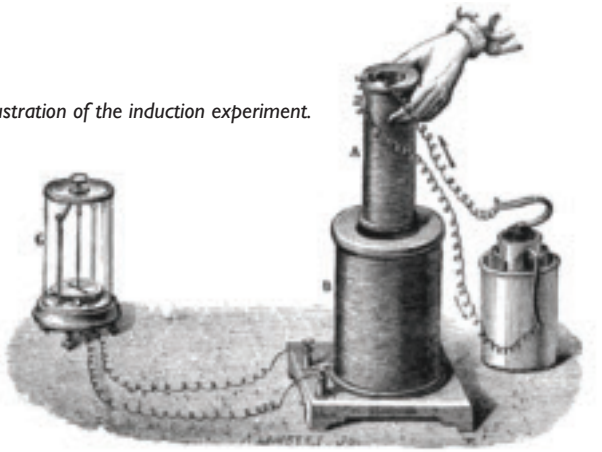
But enough about units. Let's talk about the man. Michael Faraday was born on September 22, 1791, in the village of Newington, which is now a part of London, England. His father was a tradesman with poor health and rather limited income, so there was no money for tutors or private schools. Faraday learned the basics of reading, writing, and mathematics in a church school, but if he learned any science at all, it is likely that it was very basic. At that time, it was much more important to learn a trade so, at the age of 14, he was apprenticed to a bookbinder. This leads us to the first stage of his long and varied career.

The Bookbinder. In the 18th century, books were generally sold "in boards" which meant they were just loose paper or held together in some kind of temporary binding. These pages were then taken to a bookbinder who put them in a more permanent, secure binding. Located in central London, the Ribeau shop, where Faraday worked, received many new manuscripts to be bound as well as some classics for rebinding. Faraday was quick to observe that this river of knowledge flowing through the bindery would not be diminished if he took a few sips.

So, he started to read some of the books that he worked on binding. As he read, he took copious notes, creating his own collection of scientific knowledge and philosophy. He was educating himself.

As his interests expanded, Faraday learned about a series of scientific lectures being offered to the public at the Royal Institution of Great Britain. He attended these lectures by leading scientists including the great chemist, Sir Humphry Davy. Again, Faraday kept careful notes about all that he learned. Eventually, he dared to contact Davy and applied for a job. In 1812, Davy did science a great favor by hiring Faraday as a laboratory assistant, thereby beginning the next phase of Faraday's career.

Michael Faraday, oil on canvas by Thomas Phillips, 1841–42; in the National Portrait Gallery, London.



An illustration of the induction experiment.

The Bottlewasher. As he started his employment with Davy at the Royal Institution, Faraday worked as an ordinary laboratory assistant, cleaning the lab and doing simple tasks such as washing glassware. As he became more proficient, he became more involved in conducting experiments, serving as the eyes of Davy who had been partially blinded in a laboratory accident. In 1815, Sir Humphry Davy invented the Davy lamp, a safety light for use in mines. By this time, Faraday had been sufficiently integrated into Davy's work that he made significant contributions to the development of the lamp, which Davy recognized publicly. With this and other recognitions, Faraday started to work independently and eased into the next phase of his career. As we will find, these next three "phases" overlap considerably.

The Chemist. The first decade of the 19th century was a time of great advances in the field of chemistry and Humphry Davy was at the center of the activity. By 1810, he had used the process of electrolysis to isolate several elements, thereby advancing the understanding of matter. After hiring Faraday in 1812, Davy continued his chemical investigations with Faraday's assistance, with Faraday becoming increasingly capable of working independently. Electrolysis was of special interest to Faraday and he advanced both the theory and practice of the process. In 1834, he published a report on electrolysis, giving us the words electrode, electrolyte, cathode, anode, cation, and anion.

In addition to his experiments in basic chemistry, Faraday was also involved in various projects of an applied nature. For instance, a major problem for the Royal Navy was "bottom fouling" wherein marine plants and animals attacked or attached themselves to the hulls of ships, drastically reducing their speed and maneuverability. To combat this, ship's hulls were lined with sheet copper, but the copper soon corroded and made another kind of mess. Davy and Faraday were enlisted to solve this problem. They were partially successful, and the Royal Navy sailed royally on.

Faraday's interests continued to broaden. In 1821, he was asked to review the work of Hans Christian Oersted and he added studies in physics to his considerable accomplishments in chemistry.

The Physicist. Ever since the 1800 invention of the voltaic pile — what we now call a battery — scientists had been looking for a connection between electricity and magnetism. Finally, in 1821, Oersted, a Danish physicist, observed that a current-carrying wire would cause a magnetic compass to deflect. He had discovered electromagnetism. Upon reading Oersted's description of his discovery, Faraday immediately repeated the experiment and, in short order, conducted other experiments that advanced the theory of electromagnetism. I can imagine him asking, "If an electric current can cause a magnet to move, might not a moving magnet cause an electric current?" He answered his question by plunging a magnet into a coil of wire and observing the deflection of a galvanometer. He had discovered electromagnetic induction.

Faraday being Faraday, he didn't stop there. He substituted an electromagnet for the bar magnet and got the same result. He then concluded that what induced the current was a changing magnetic field and recognized that he could change the field either by moving the electromagnet or by changing the current that energized the electromagnet (*see image above*). A further leap of reason and/or intuition led him to put two coils of wire on an iron ring, change the current in one, and observe a changing current in the other. He had invented the transformer. He also built rudimentary generators and motors, foreshadowing the practical use of electromagnetism.

The Public Scientist. I list this as a phase of Faraday's career but really it spanned most of his professional lifetime. As his scientific talents became recognized, his fame grew, not only among fellow scientists but among the general public as well. One of his contributions to the public was his creation in 1825 of the Royal Institution Christmas Lectures. Except for a brief hiatus during World War II, these lectures — actually a series of several related lectures — have been delivered every year since. Faraday himself delivered 19 of these series. His 1848 lectures, "The Chemical History of a Candle," were published as a book in 1861 and have never been out of print. The book can be purchased in either print or electronic format. I recommend it highly, especially for the chemically inept such as yours truly.

There is much more to tell about Michael Faraday, but I hope this gives the reader some sense of how brilliant and creative he was. He contributed to many fields but is especially well known for adding to the understanding that electrolysis involves the transfer of charge. A capacitor — its size measured in farads — stores charge. And that's why we call a farad a farad.

Lyle D. Feisel, Ph.D., P.E. (Ret.) is dean emeritus of the school of engineering and applied science and professor emeritus of electrical engineering at Binghamton University. Following service in the U.S. Navy, he received B.S., M.S., and Ph.D. degrees in electrical engineering from Iowa State University. From 1964-83, he was a faculty member of the South Dakota School of Mines and Technology, serving as head of EE from 1975-83. Feisel was a national visiting professor at Cheng Kung University in Tainan, Taiwan, during 1969-70, and served as the founding dean of engineering at SUNY Binghamton from 1983-2001. He was named Tau Beta Pi Outstanding Alumnus in 2002. Feisel is a life fellow of the IEEE and a fellow of ASEE and NSPE.

Due to COVID-19, District Conferences scheduled after March 12 were either cancelled, postponed, or held virtually. Only 7 of the 16 conferences were held in-person before this date. The following are summaries and images from 4 of the 2020 District Conferences held this spring.

District 3

Drexel University was the location for the **District 3 Conference** hosted by the Pennsylvania Zeta Chapter February 14-15 in Philadelphia. In addition to standard chapter operational and transition best practices, District 3 Director Chris C. McComb, Ph.D., *CA P'12*, facilitated a Design Thinking workshop over the weekend on how to make ΤΒΠ a more diverse, inclusive, and meaningful organization. Six industry and academic guests participated as interviewees in the workshop. Excellent discussions and ideas emerged from the cross-chapter teams which were presented to the guests and Association Officials at the conclusion of the conference. Actionable next steps were identified and follow ups were scheduled with each collegiate chapter in attendance.

District 9

At the **District 9 Conference** in Lawrence, KS, hosted by the Kansas Alpha Chapter, attendees participated in a variety of programming to benefit the growth of collegiate chapters and the individual growth of the students involved. Presentations were given on the roles of Association Officials, chapter reporting, and benefits of membership. There was also an alumni panel, where six engineers from the area with a variety of career paths spoke about their industry and academic work. Ideas that came out of the group meetings included creating a Kansas City Alumni Chapter, expanding the Univ. of Kansas engineering formal, sharing the Univ. of Arkansas career fair benefits, and working with initiated university deans to advertise chapter activities and initiation invitations.

South Dakota School of Mines and Technology (SD Alpha) hosted the **District 12 Conference** on February 29 with more than 50 students in attendance. The day began on campus with introductions by SDSM&T President James Rankin, Ph.D., *SD A '78*, and longtime SD Alpha Chapter Advisor Larry A. Simonson, Ph.D., P.E., *SD A '69*. Conference highlights included: an alumni panel, a trip to nearby Mount Rushmore National Memorial, and attending a collegiate basketball game the night before.

District 12

District 16 held its annual Conference on February 29 and March 1, hosted by the California Xi Chapter at San Diego State University. More than 60 members from 13 collegiate chapters and delegations from all three district alumni chapters, along with the D16 Directors, met in historic Hardy Memorial Tower to exchange ideas for chapter improvement and leadership development. Departing from the traditional format, the bulk of the sessions over the two days were presented by members and teams from the collegiate and alumni chapters. Six alumni presented sessions on topics concerning leadership, chapter communications, budgeting, eliciting volunteers, and activity planning.

District 16

2020 Alumni Giving Program February-April Contributors

The names of 2,802 Tau Beta Pi alumni and others who made donations to the Association in the 2020 Alumni Giving Program appear in two separate sections on the following pages. Their gifts totaling $495,458 arrived between February 1 and April 30, 2020. Names preceded by SPEC denote gifts from non-members. **Gifts received after April 30 do not appear here but will be published in the Fall 2020 issue of *The Bent*.**

The generous support of each member is deeply appreciated by the Executive Council and other Association Officials. 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.

Recognition Club Donors are listed alphabetically within their chapters and appear in the first section below. Pre-Club Member-Contributors appear in the subsequent section. 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 gifts acknowledged here, several were made anonymously and are also deeply appreciated.

Donor Recognition Clubs

The names of 2,360 Tau Bates and others appear in this first section. They made donations to the Alumni Giving Program between February 1 and April 30, 2020, AND they have also made CUMULATIVE contributions (in some cases including matching gifts) and bequests to Tau Beta Pi through the years totaling from $250 to more than $1,000,000.

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 us, with confidence in our financial resources, to plan for 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	Founders Club	250
Heikes Club	50,000	Zeta Club	2,500		

WILLIAMS CLUB

NY Δ Wright, Peter A. '75
NY E Anonymous '58
VA A White, Dudley '76

Dudley White: TBP HQ staff, thanks for the pickup off the Appalachian Trail last year.

HEIKES CLUB

GA A †Stowell, Robert L. '60
IN Δ Koller, David Christ '62

ALPHA CLUB

CA Γ Levin, Robert Edmond '53
IN A Clements, David '80
Newcomb, Robert W. '55
IN E Dausman, Alan Vernon '77

Alan Dausman: It is an honor to support the engineering leaders of the future.

MA B Quick Jr., Roy F. '70
NJ A Forslund, Donald C. '60
NJ Δ Lim, Yung Bong '87
OH Γ Beans, Bill '53
OH Δ Robe, Richard '55
PA Z Abriola, Linda Marie '76
RI B Brennan Jr., John F. '81
WV A Clutter Jr., James H. '70

BETA CLUB

AK A Stella, Damien F. '82
CA E Case, Daniel Keyte '87
CA N Steenhoven, Jerry C. '77
CA T Fable, Scott Edward '96
DE A Gutshall, Thomas Lee '60
Sharp III, Rodney '60
FL B Robert, Raymond W. '66
IL B Clewett, Thomas Alan '88
IL Γ Rasmussen, Warren '53
IL Z Allendorfer, Robert K. '83
IA A Burmeister, Jon Barth '68
Peterson, Michael L. '89
LA E Champagne Jr., Pierre '76
MA H Sin, Chi-Kai '88
MI A Colbry, Dirk Joel '06
Colbry, Katy Luchini '99
LaFrey, Raymond R. '61
NY Γ De Groot III, Ward W. '54
NY E Maniscalco, Thomas L. '67
NY Ξ Denning, Peter James '64
OH A Ferencz, Robert Mark '80
Salamon Jr., Peter F. '71
OH Γ Mahaffey, Jack L. '54
OK A Morris, Jay Kevin '81
PA B Klingensmith, Rick L. '82
PA Δ Harker, Patrick T. '81
PA Λ Anonymous '90
TN A Cook, James Michael '72
Holmes, Sammy S. '78
Hopkins, John A. '88
King III, Philip W. '66
TN B Abriola Jr., Joseph L. '80
TX A Kothmann, Richard E. '59
Mickelson, Kent B. '77
VT A Brand, Ronald Parsons '60
VA B Friar, Billy Wade '58
WV B Payne, Michael E. '81
WI A Beutler, Arthur Julius '48

DELTA CLUB

SPEC Anonymous
AL A Griffith, Gordon H. '57
AL Δ Fogle, Frank Risher '80
CA H Crotchett, Denton R. '71
Noble, Gary D. '96
CA N Erickson, Ralph E. '71
Lytle, Scott K. '86
CA Y Idenmill, Ethan M. '04
Mukhar, Marwan J. '93
FL A Biasco, James Randal '78
Lewis, Becky Ann '04
Shacter, Philip '79
Uhler, Robert Bruce '74
Vice, William Eugene '70
IL A Luzbetak, Paul Daniel '96
IL B Bernhardt, John E. '89
IN A Davidson, Charles D. '72
McDonald, John D. '73
Vosteen, Louis F. '52
IN Δ Brandt, Daniel Melvin '74
IA A Ask, Andy C. '64
KS A Powell, Ricky Steven '80
Reid, Jack Powell '57
KS B Mueller, Robert Lynn '67
Patton, Robert E. '70
LA Γ Baldwin Jr., George A. '78
MD B Burgio, Robert Blake '87
Sabio, Vincent Joseph '86
MA Z Lewis, Nelson David '73
MI Γ Hopping, William D. '71
Tielking, Tom '62
MI Δ Stanczak, John S. '70
MI E Schmuhl, John Curtis '71
Strebendt, Richard E. '65
MI Z Dymale, Raymond C. '70
Quaid, Richard C. '65
MN A Stanley, Steven F. '84
MS A Nelms, Larry Thomas '63
MO A Edgington, Bobbie G. '69
MO Γ Taber, Norma J. '80
MT A Carlson, Gene Stewart '64
NE A Walcott, Gwen Sharyn '82
NH A Dycewicz, Vickie Sue '96
NM B Modrall, David R. '91
NY A Elwell, Bill Edward '78
NY B Fleisher, Richard S. '72
NY Θ Bauer, Richard C. '66
NY K Muller-Girard, Otto T. '52
OH A Markuson, Donald M. '80
Oran, William Alex '63
Rasbold, James C. '83

Chuck Rasbold: Enjoys reading the Brain Tickler's column in each issue of the magazine.

OH B Zureick, Elizabeth A. '73
OH Δ Penko, Paul Frank '67
PA A Brunner, Thomas M. '63
PA Z Walter, Donald K. '53
PA Λ Schuler, Joseph J. '80
SC B Daley, Leslie N. '71
TN A Romer, Michael C. '04
Rosser, Howard Ward '70
Wilson, Wayne '77
TN B Thomas, James Louis '77
TX A Tran, Tan Dai '87
Wells, Roger Murray '71
TX E Sitton, Randal Warren '85
UT A Endo, Thomas Minoru '62
VA A Agosti, Steven J. '81
WA A Gunter, Robert Arnold '62
WV A Fourney, Michael E. '58
WI B Smith, John Gerard '87

ZETA CLUB

AL A Stone, Jeffrey Ira '79
AL B Mosley, Talmadge M. '65
AL Δ Selby, Michael W. '96
AK A Usibelli, Joseph Emil '59
AZ B Berry, John Bradley '89
AR A Newtown Jr., Glenford '69
CA A Fong, Kirby William '67
CA Γ Fowle, Mark C. '76
Fuller, Robert O. '51
Hillier, Frederick S. '58
Holmen, Bob R. '85
Parker, Henry W. '45
CA Δ Zehrbach, Bill Ernest '69
CA E Brunton, Daniel W. '78
Dobbs, Michael Wayne '66
McCandless, Roger J. '65
Schurr, Hermann D. '82
Simsarian, Gregory G. '82
Warner Jr., John H. '63
CA Z Pham, Alexander H.N. '88
CA H Van Zwol, Jason '77
CA Θ Anonymous '84
CA M Tucker, Naftalia F. '89
CA N Shimokawa, Reyn Y. '95
CA P Kraft, Lyle David '87
CA Y Alexander, Joseph W. '06
Alexander, Rachel K. '15
CO A Anderson, Arvid Neil '54
Maurer, Mike Allen '87
CO B Franchino, Robert A. '60
CO Γ Mead, Richard Wilson '63
Pearson, Larry '64
CT A Livingston, Robert M. '57
Yamachika, Thomas '80
CT B Leib, David Bernard '61
Pitkin, Edward T. '52
FL A Lewis, Lee Conley '91
Passman, Alan Joseph '06
FL Γ Lyons Jr., Thomas F. '76
FL Δ Nugent, James C. '95
IL A Beanblossom, Todd M. '80
Robertson, John Allen '65
Tomasic, Michael G. '66
IL B Carter, David William '68
IL Γ Dixon, David Allen '63
IL Z Glait, Scott Steven '84
IN A Beal, Dick H. '49
Bodemuller, Robert A. '70
Ginter, James Lee '67
Houze Jr., Gerald L. '58
Ihlenfeld, Jay V. '74
Novy, Robert Alan '85
Renner, Arnold E. '54
Weigand Jr., Karl R. '66
IN Γ Jackewicz Jr., Joseph '75
Kelly, Robert A. '65
IN Δ Epperly, Michael P. '65
IA A Berkholtz, Nicholas E. '56
Hammar, Kelly Jean '89
Manning, Thomas W. '64
Snyder, Merrill H. '68
KS A Conrad, Kenneth F. '74
Meyer, Leslie D. '65
KS Γ Hefty, Keith William '87
KY A Davis Jr., Lewis B. '66
LA Δ Lejeune, James Joseph '73
ME A Blaisdell, John Robert '66
CA Γ Hamilton, Wayne A. '58
MD A Gutsmuth, Henry R. '56
MD B Beard, James L. '67
De Oms, James H. '68

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Joseph, John Hamilton '85
Morgan, Anne F. '87
MA A Alley, Christopher P. '85
Descoteaux, Kenneth '89
Lescoe, James T. '05
MA B Dettmer, Robert G. '55
Hirsch, Alan Robert '66
Mandell, Gordon Keith '69
McInnes, Harold A.B. '49
McKim, Thomas Francis '75
Petrofsky, Alfred M. '50
MA Δ Sullivan, Gerard Francis '68
MA E Bittner, Douglas E. '83
MA Z Boraski, Nicholas '50
Strzegowski Jr., Joseph '67
MA I Musiak, Ronald E. '68
MI A Chamberlain, Adrian R. '51
Chiti, James D. '71
Gardner, John Albert '77
MI B Ojala, William Keith '54
Saccany, Richard J. '71
Vukovich, Robert James '83
MI Γ Frederick, Frank T. '71
Gromer, John David '74
Johnson, Kalin Shaw '46
Karl, Donald Edward '71
Seidel, David Allen '81
Smithies, Henry '49
Stewart, Steve Russell '66
Subramanian, Suresh '88
Wackenhut, Thomas C. '69
MI Δ Dietrich, Robert W. '57
Rose, Jonathan Douglas '81
Wall, Raymond J. '50
MI E Boileau, James Maurice '87
Sluchak, Thomas John '77
Szafranski, Joseph Paul '66
MI Z Pettiford, Steven D. '72
Slovesko, Shawn M. '97
MI H Hill, Scott S. '83
Obudzinski, Gary T. '76
MS A Black, Howard Wayne '95
Boozer, Drayton Daniel '66
Coley, James William '61
MO A Sandfort, Robert Melvin '64
MO B Elliott, Joseph Oscar '71
Miller, Michael John '74
MO Γ Chambers, David Hugh '80
Gillespie, Charles K. '57
MT A Brown, Lloyd Robert '72
NE A Schmidt, Wayne W. '70
NJ B Carey, Mark '77
Dougherty, Steven P. '64
Rodgers, Douglas Noss '67
Schelke, Joseph Anton '51
Sharkey, John Michael '84
NJ Γ Mandle, John Bauer '52
Mauermeyer, Henry A. '72
Weibrecht Jr., Edwin H. '68
Wojslawowicz, Jack E. '70
NM A Smith, Jeffrey A. '84
NM B Menako, Jack Allen '84
NY B Leader, Jeffery James '85
Newman, Michael '84
Wedlake, Raymond A. '73
NY Γ Anderlik, Jeffrey David '89
Geschwindner Jr., Louis '67
Ordway III, Fred D. '69
Smith III, George Earl '80
Thal Jr., Herbert L. '53
NY Δ Dougherty, Jack W. '59
Nelson, Arnold Stanley '50
Zises, Matt Scott '96
NY E Freier, Otto Albert '70
NY H Arminski, Leslie M. '75
Pasquarelli, Louis Ralph '73
NY Θ Foell, John Daniel '77
NY K Coleman, Thomas G. '62
Gaul, Michael Arthur '76
NY Λ Kern, Peter Leonard '62

Peter Kern: Graduated from Regis High School alongside Dr. Anthony Fauci in 1958.

Kuras, John Edward '69
Moon, Monte Lee '75
NY M Czuba, John Stanley '78
NY N Sherman, Lawrence J. '74
NY Ξ Kmetzo, John Liston '63
O'Keefe, Luke Francis '80
NY O Froeschl, Gary George '71
Ribuffo, Michael Rocco '75
NY Π Cole, David Michael '88
NY T Olenik, Anthony M. '08
NC A Hunter, Stuart '47
Ma, Robert Ping-Chung '88
ND A Herbold, Frederick Jon '69
OH A Goralski, Christian T. '64
Gropp, William Douglas '77
Hamilton, Joshua J. '09
Ikeda, George T. '54
Linsalata, Frank N. '63
OH B Totten, James Ernest '56
Yost, David Brian '87
OH Γ Clum, James Avery '60
Cowan II, Robert Lee '66
OH Δ Wuerdeman, Robert C. '69
OH Z Armstrong, Chris Kent '00
Armstrong, Ellie R. '01
Bliss, Douglas Paul '75
Panning, Daniel Wayne '79
Pyers, Dean Hale '84
Rose, John David '82
Tenney, Thomas H. '67
OH H Campbell, John Joseph '76
Senyk, Joseph Michael '67
OH K Yannayon, Benjamin C. '05
OH Λ Nicalek, Richard Allan '76
Kovacs II, William '74
OK A Blackener II, Dave L. '83
Johnson, James '59
OK B Bobo, James Edward '77
OR A Cantwell, Gary K. '80
McCormick, Gary Allen '74
Milton, Stuart W. '84
Paynter III, W. Burton '74
PA A Berglund, Thomas A. '82
Leitch, Donald George '56
PA B Cirota, Marcie Dale '95
McGivern, Patrick John '90
Sterner, George R. '62
PA Γ Shaffer, David Bruce '68
PA E Kuhn, William L. '67
PA Z Pechulis, Michael John '97
PA I Salyers, John Marshall '01
PA Λ Reedy, Herman Earl '75
RI A Nielsen Jr., Carl Ernest '56
SC B Pinckney, Charles P. '77
SC Γ Hanes, Richard Michael '67
SD A Johnson, Jerry Allen '92
TN A Baker, Jon Pankey '74
Bounds, John Alan '80
Lillard Jr., James D. '75
Massimini, Michael Ian '76
Moore, Robert Monroe '66
Shafer, Robert Weldon '47
TN B Casson Jr., Walter A. '56
Kepper III, James H. '71
Shackleford III, James '60
TN Γ Denny, Hugh Wayne '60
TN E Smith, Craig '80
TX A Kuenemann, Wesley B. '59
Lancaster, David C. '61
TX Γ Dobbins, James Roy '74
Griswold, Ronald Kent '71
Turvey, Harry Douglas '73
TX Δ Barger, David Carl '71
Clinton Jr., Daniel D. '52
Johnson, Dennis Ray '74
Kaminski, Bryan J. '84
Porter, Larry Gene '64
TX H Falk, Nathan Max '75
Nicholson, James Eric '75
TX Θ Alvarado, Ruben A. '72
UT A Lyman, George Randall '79
VT A Kellogg, David Holt '62
VA A Johnson, W. Reed '53
Wadsworth, Robert M. '82
VA B Dirling Jr., Raymond B. '64
Lovell, Matthew Bruce '96
Lovell, Lale Gokbudak '96
Marcus, Larry Allen '72
Shearer, Richard Lee '70
VA Γ Abbott, Terence S. '75
Labelle Jr., William '89
Richmond, Mark D. '98
WA A Ross, Robert Bruce '61
Williams, Donald S. '66
WA B Bowers, Jack W. '80
WV A Rockenstein, Richard '63
WV B Ashman, Michael D. '84
Dehart II, Robert E. '72
Hughes II, Paul K. '71
WI A Crooker, Thomas W. '60
Derusha, James R. '55
Wolff, James F. '59
WI Γ Klos, Timothy Allen '88
WY A Davidson, Steven Lee '80

CHI CLUB

AL A Glover, Martin C. '70
Henderson, Phillip R. '62
Wear, A. Wesley '92
AL B Andrzejewski, Joseph '90
Bell III, Willis Vincent '78
Hopper, Jeffrey Clark '78
Slaughter, Charles Jeff '82
AL Γ Braden, James Michael '76
Gilbert, Rodney C. '67
Haggard, Warren O. '94
AL Δ Appleton, Robert S. '90
AL E Zozulin, Alexander J.'91
AK A Keeney, Joseph Harry '78
Keiser, Jan Ann '76
AZ A Bell, Edward Anthony '72
Kennedy Jr., Thomas '59
AZ B Forster, Karl David '86
Latta, David Raymond '89
Leach, David Robert '76
Marchand, Jean M. '68
Wong, Jack Onc '81
CA A Butner, David Norman '61
Dietsche, Laura Jean '81
Figueira, Michael R. '73
Hoe, Albert '92
Mar, Wing Jong '79
May, Howard Russell '51
Panichelli, Paul Albert '83
Secor, Kenneth E. '55
Wing, Jimmie '52
CA Γ Barnum, James R. '65
Hamilton, Willard E. '48
Kwong, Michael Y. '95
Rasmussen, Nicholas '68
Reneau, Leon R. '58
Root, Steven Dale '75
Taniguchi, Brian Y. '77
CA Δ Barr, Juliana '80
Fernandez, Ferdinand '58
Griffith, Glen Arthur '72
Johnson, Wesley W. '66
Katin, Robert A. '74
Koppany, Charles R. '63
Moretti Jr., Vincent C. '78
Moulton, James R. '54
Nakatani, David T. '63
Roof Sr., Dwight Ellis '57
CA E Holzman, Eric Louis '84
Ohgi, Frank '60
Reichert, Ralph J. '67
CA Z Jacobberger, Donald '58
Lampe, Fred Paul '79
Nulk, Robert Anthony '58
Perrin, Michael Elton '67
Wagner, J. Arthur '61
CA H Clark, William Charles '72
Rossow, Terry Lynn '66
CA Θ Bach, David P. '69
Berg, Jeffrey A. '84
Blanco, Catherine E. '97
Hinker, Fred L. '68
Hoekstra, Gerben N. '66
Slater, Eric Kent '67
Thabault, Charles W. '91
CA I Haan Sr., George T. '69
CA K Moncsko, George E. '68
Ramirez, Marvin J. '82
CA Λ Johnson, Lowell H. '65
Verbrugge, John Allen '77
Young, Jeffrey W. '69
CA M Clark, David James '99
Freeman, Karl Allen '89
Lafontaine Jr., William '85
CA N Armstrong, Lorrie A. '84
Armstrong, Robert A. '81
Harenberg, Donald D. '61
Howard, Robert S. '80
Jordan, Patrick A. '87
Mayer, Robert James '85
Newberry, Conrad F. '57
Ortiz, Janet M. '82
Veit, Brian Richard '98
CA Ξ Baxley, Paul Alma '81
Curry, Monica G. '92
Curry, Robert Stanley '94
Doeing, Brian James '81
Patterson, Richard H. '74
CA O Elliott, Pamela Ann '88
Mulvihill, Michael E. '60
CA Π Mullen, Merritt David '70
Steinberg, Dennis P. '72
CA P Hoffmann, Kevin Von '80
Koehn, Calden Ray '81
Koehn, Lisa Renee '82
Mandrell, Nathan K. '92
CA Σ Radasky, William A. '81
CA T Breneman, Kenneth P. '89
CA Y Davis, Sean Thearon '94
CA Φ Shelly, Ronald W. '62
CA Ψ Chiu, Corinna Jane '93
CO A Grandey, Gerald W. '68
Peters, Richard Duane '80
Rense, John A.L. '74
CO B Austin, Stephen Coe '74
Brooks Jr., Lowell W. '62
Cormack, Christopher '82
Herhold, Mark K. '80
Hidahl, Jerry Paul E. '77
Solomon, David '49
Talcott Jr., Noel A. '73
Watry, Michael Owen '86
CT A Bennett, Beth Anne '91
King III, C. Judson '56
Kucera, Daniel Jerome '61
Troutman, John Leo '65
Verges, Hugo Ponce '49
CT B Devin, Maurice Roger '73
Fappiano, Michael D. '87
Hurley, John Frank '66
DE A Cercy, Michael James '81
Hahn, Charles Rodney '73
Packard, Lawrence B. '88
DC A Hull, Wayne Kenneth '59
DC B Delgado, Antonio J. '93
Ratto, Christopher R. '07
Roberts, Carol Ann '63
Roberts, John Paul '62
DC Γ Grassel, Herbert Hans '77
Mitchell, Reginald S. '65
Whitham, Charles L. '61
FL A Flewellen Jr., William '50
Giolma, J. Paul '69
Higgins, Adam Steven '03
Iwens, Ralph Peter '62
Mennes, C. Martin '68
Traverse, Richard S. '71
Vande Walle, Robert J. '72
Walton, Ray '77
Woodward, Michael B. '85
FL B Alvarez, Vicente '64
FL Γ Ball, Arthur Morley '70
Brookins, Thomas M. '81
Chenkin, Joseph Alan '82
Emerson, Michael J. '83
Paugh, Wayne Bruce '93
Stagner, Ralph Scott '82
FL Δ Jayne, Darnell M. '90
FL Z Hatfield, Thomas A. '87
FL H Baran, Thomas V. '93
GA A Barber, Brian Robert '81
Busbin, Steven J. '83
Crapps, David K. '62
Crawford, David W. '61
Dixon, Daniel B. '63
Faulkinberry, David '77
Hair, James Graham '59
Hirth, Roy Michael '78
Kaduck Jr., William W. '76
Kuniansky, Eve L. '81
Lorenzo, Donald Kevin '77
Northington, Peyton '78
Tundermann, John H. '63
Ware Jr., Clyde Lee '59
Wetenhall, Paul David '73

Paul Wetenhall: Still using engineering analysis…now for coronavirus dynamics.

ID A Ahlschlager, Alan D. '87
IL A Bein, Robert Walter '56
Benzinger, Leonora A. '86
Buboltz, Lisa Ann '01
Clark, Elliot Andrew '83
Jonas, Steven Geza '66
Kasik, Phillip Mark '68
Lanzerotti, Louis John '60
Le Blond, Peter Carl '75
Schilson, Robert Earl '50
Sorenson, Gregory E. '03
Szumski, Daniel R. '80
Tatara, Richard M. '78
Thompson, Marshall R. '60
Vogel, Rick M. '80
Waranauskas, Amy L. '85
IL B Anderson, Robert F. '62
McCormick, Thomas J. '60
Sodoma, Mark Thomas '82
IL Γ Gubisch, Roland W. '64
Handel, Gene Melvin '68
Miner, Warren Philip '59
Pineault, Wayne '79
Wilsak, Richard Allen '78
IL E Chen, Juh W. '53
IN A Binash, Irene Marie '79
Bower, William Walter '67
Brinson, Robert James '60
Brodie, Bruce Rogers '65
Clodfelter, Donald G. '55
Cripe, Duane Byron '82
Cross, Perry Gregory '74
De Poy, Phil Eugene '57
Dries, David James A. '76
Edwards, Deborah J. '85
Hall, Thomas Wayne '67
Harvey, James Alan '81
Johnson, David Harley '63
Lambert, Ralph E. '68
Maloney, Eugene D. '64
Middendorf, David P.J. '71
Moeschl, Stanley F. '57
Montgomery, Stephen '71
Mosier Jr., Andrew C. '78
Muehlbauer, James H. '63
Risa, Kristen '69
Satterly, Paul Benson '82
Sommer, Dianna Marie '83
Sosnay, Richard G. '66
Stokes, Ronald Blaine '60
Travis, John Charles '47
Warren, Scot William '83
Wright, Ronald R. '71
Yoder, Norman E. '71
IN B Friel, Leroy '57

CHI CLUB CONTINUED

Graham, James Henry '72
Rosenbarger, Donald '78
Schipper, Michael J. '82
IN Γ Drnevich, Raymond F. '70
Farrow, Michelle D. '83
O'Connor, Brian T. '72
IN Δ Dietrich, Jay Michael '80
McAlear, Hugh M. '64
IN E Liechty, Douglas Lynn '73
IA A Amos, L. Lyeal '69
Carosella, Sandy L. '88
Cerwick, Joel Alan '66
Coffman, Vance Dean '67
Cosgrove, John D. '56
Hicks, Roger Dale '57
Keene-Mason, Alice F. '05
King Jr., Maurice A. '67
McGinnis, Bryan John '63
Owens, David Andrew '91
Pedersen, Robert D. '62
Puffett, George E. '83
Smith, William James '66
Van Zante, Dale Eugene '90
IA B Boldt, Donald Bernard '57
Lawson, James T. '70
KS A Conner, Harold Wayne '54
Harmony, Marlin Dale '58
Hinton, Robert Allan '61
KS B Hockett, James Keith '66
KS Γ Erickson, Larry Eugene '60
Tracey, Deborah S. '86
KY A Anderson, Lee Roy '71
Bittle, David F. '59
Congleton, Stephen D. '79
Cook, Robert Henry '74
Craig, Joe Lockett '50
Halloran, Stephen R. '75
Heckrotte, Rita Warren '72
Hord, Jesse '56
KY B Hauenstein, Bruce R. '76
Meyers, James Frank '69
Raderer, Thomas Kerry '73
LA A Armistead, William T. '71
Capell III, Robert L. '70
Corripio, Armando B. '63
Nelson Jr., George Gus '52
LA B Rogers, R. Bradford '79
LA Γ Jenkins, James S. '80
Thomas, Robin Carol '92
ME A Havey, Mark Douglas '73
Henderson, Wallace D. '58
Ouellette, Alfred David '76
Petherbridge, David F. '56
MD A Gitomer, Steven Joel '64
Linaweaver, F. Pierce '55
Lu, Stanley '95
Monmonier, Mark '64
Winter, George William '48
MD B Amtmann, Louis Gerard '66
Antony, Roger William '71
Birkmire, John C. '95
Ewing, R. Alan '67
Himes, Doug Lamar '82
Iacangelo, Gerard Felix '80
Moorcones, Joseph John '67
MD Γ Dickson, Brien Wayne '93
Quint, John H. '84
MA A Auclair, Jared Robert '01
De Andrea, Paul John '75
Mangiarelli, Christopher '96
MA B Ball, Norman Addison '60
Bishop, Peter B. '70
Broughton, William J. '61
Butkus, Lawrence M. '85
Charpie, David Wayne '82
Ferguson, Keith M. '62
Honke, James Kazuo '63
Isnardi, Michael A. '82
Klein, Harrison John '71
Koehler Jr., Richard F. '67
Marks, Lloyd Alan '71
Martel, Philip Omer '72
Maskrey, Robert Harley '63
Patterson, John Bryan '68
Simpson, Richard Allan '67
Spradlin, Louis Woodson '57
Vlahakes, Gus John '71
Wrinn, Joseph Francis '75
MA Δ Adams, Randolph Keith '70
Babaian, Peter Martin '99
Brown, Linfield Cutter '64
Buffinton, Keith William '79
Flaherty, Joseph C. '84
Hildebrant, Eric Michael '92
Milauskas, Ronald J. '62
Russell, Jack Hesseltine '54
Savage, Paul David '77
Smeglin, Anthony M. '76
Stark, Lucius Dickinson '64
MA E Williams, Charles R. '53
MA Z Brindis, Samuel B. '80
Ewell, Kenneth Albert '68
Flynn, John Callahan '59
Philbrook, T. Varnum '73
Rainville, Robert F. '68
MA Θ Allen, Karen M. '89
Burns, Nancy E. '84
Gregg, John Edward '84
MI A Beck, Maureen E. '03
Chaffee, Stanley W. '74
McIntosh, Carl L. '70
Regenstreif, Joyce '78
Suszko, Andrew M. '73
Watanabe, Gerry Torao '72
Woelzlein, Wilmar M. '51
MI B Bekins, Randell Lee '80
Bentley, James Herbert '57
Bohrer, Timothy Henry '71
Dejonge, Michael Kent '65
Glidden Jr., Harry J. '65
Maki, Steven Michael '76
Mattson, James Arthur '70
Plutchak, Raoul Edward '62
Stehulak, Edward S. '86
MI Γ Ardis, Robert Boyd '46
Baxter, John Edward '57
Boesiger, Edward A. '82
Bonfanti, Giovanni '62
Campbell, John A. '62
Capelli, Ronald B. '73
Davies, John Richard '50
Delgass, William N. '64
Fertel, Howard Kevin '79
Finnegan, Patrick M. '57
Goodell, Charles E. '43
Grossman, Michael Alan '88
Hansen, Peter Ernest '61
Leeds, Thomas Murray '85
Macika, Raymond E. '86
Margolese, Kate '84
Maugh, Roger Edward '55
Nobunaga, Alan Shizuo '83
Othman, Roger M. '74
Pearl, John Christopher '61
Schoenhals, Robert J. '56
Sheets, Alan '81
Snyder, Robert Joseph '77
Stewart, David Mark '76
Walker Jr., H. '58
Washburn, John Robert '69
Wentzel, Richard D. '60
Wingard, Joseph '80
Winter, Steven D. '81
Zechel, Gary Michael '62
MI Δ Caste, Richard Alan '68
Elward, Bob M. '75
Rossi, Nicholas Michael '63
Wojciechowski, Matthew '71
MI E Benci, John Edward '83
Chudd, Richard Alan '66
Doughty, Robert Earl '65
Mertz Jr., Harold J. '61
Sigler, David Rudolph '76
Zickafoose, Michael W. '97
MI Z Foraker Jr., David E. '58
Gillham, Gregory V. '83
Haines, John Gregory '72
Kovacs, Robert Lewis '86
McEwen, Stephen N. '54
Reardon, Robert W. '74
Roth, Maureen Lynn '91
Sadlo, Thomas George '77
Wright, Hugh Douglas '55
MI H Nelson, David Arthur '85
MI I Flowerday, Andrew J. '02
MI K Seymour Jr., Richard L. '97
Sikkenga, Chad Douglas '98
MN A Christensen, Thomas M. '79
Lapakko, Kim Alan '76
Larson, Michael Lane '59
Maus, Brian Wayne '81
O'Leary, Stephen H. '69
Petrich, Gale Sean '86
Polacek, James Hills '52
Van Essen, John Scott '74
MS A Dixon, Charles James '56
Hibbard, Janet C. '86
Hibbard, Michael Joseph '78
Hilkert, James Michael '71
McKay Jr., Frank Fay '60
Seitz, Thomas Bingham '63
Wachs, John Jay '71
MS B Woody, Marvin David '79
MO A Caruthers, James R. '69
Gritzo, Ludwig Adam '58
Haferkamp, Jeffrey John '76
Hammar, Phillip Carl '65
Hea, James Peter '68
Kehoe, Martin James '72
Sprouse, Loren V. '73
Zimmerman, Mary M. '87
MO B Arnoldy, Richard R. '69
Buenemann Jr., Morris '82
Hardebeck, Harry E. '57
Horstmann, Paul W. '73
Mahin, Clifford Alan '76
Scherrer, Paul Keith '71
Schwent, Dale Gerard '84
Sedovic, Pete Stephen '81
Steinman, Rebecca Lee '96
Unnerstall, James A. '56
Voss, Thomas Robert '69
MO Γ Apanel, Anna Maria '80
Fisher, John William '56
Galambos, Theodore V. '53
Goldring, Stanley '64
Salman, Naif Diab '56
Shomber, Henry Rolan '78
Standridge, Charles R. '75
MT A Courville, George E. '59
Jellison, Gabe Lee '98
Kolb, Robert C. '61
Whitcomb, David L. '64
NE A Cowling, Edgar Charles '75
Fuerst, John M. '82
Kaminski, Wayne Alan '79
Plummer, Scott Royce '81
NV A Jones, Keith Alan '85
NV B Nietling, John J. '90
NH A Amazeen, Bruce E. '65
Greene, Prescott '57
NJ A Compton, Joanne B. '79
Hoyt III, John George '76
Osborne, Scott Reynard '70
Turgyan, Terrence J. '75
Waricka, Peter Thomas '71
NJ B Babb, John Everett '71
McCord, William Fred '64
Rabin, Dan E. '73
Regazzi, John Robert '76
Shelestak, Larry J. '75
NJ Γ Andrus, James '02
DeWaal, Johannes '70
Dooley, Ronald M. '64
Furtado, Victor Cunha '58
Husson III, Matthew A. '66
Moeller, Peter Allan '78
Pecca Jr., John Anthony '87
Pinto, Dick Cunha '56
Puhan, Robert '75
Reitsma, David '65
Szebenyi, Thomas A. '69
Tubello, Jeffrey '76
Zierau, Siegfried Max '61
NJ Δ Coco, Elizabeth Halliday '87
Meyer, John Edward '81
NM A Havens Jr., Kenneth H. '78
NM B Andrews, Mark Jay '91
Salas, Thomas M. '85
NM Γ Rocco, Jim Robert '85
NY A Au, Peter Yuk Tak '93
Cohen, Adam Barrett '85
Croll, John W. '12
Kundakci, Vace '73
Morgan, Thomas Arthur '78
NY B Chandler, George D. '70
Poulsen, Neils Ray '57
Stanton, James William '61
Yabroudi, Abdallah H. '78
NY Γ Bergenthal, Jon Francis '75
Bond, Paul William '72
Dowgwillo, Robert M. '75
Dupier, Dennis George '61
Hirschman, Gordon B. '78
Huie, Joseph Albert '52
Mucher, Craig Allen '82
Natale, Michael Robert '02
Schrier, Steven Brett '82
Schultz, Stephen Parker '70
Veldman, John Peter '70
Wadsworth Jr., W. '76
Zmroczek, Leon A. '78
NY Δ Bauer, Douglas Cufford '61
Carino, Nicholas Joseph '69
Elko, Michael Joseph '89
Frantz Jr., Rolf A. '66
Heineman, Duane T. '58
Humphrey, John M. '67
Klepeis, John Emrich '85
Livingston, Laura Jane '73
Reynolds, David Allen '71
Roseman, Ann Lynn '81
Schwenker, David W. '67
NY E Dobbins, Bob Mark '73
Febesh, Melvin '47
Grace, John Thomas '55
Koehler, George Richard '63
McConnell, Donald P. '71
NY Z Gersten, Marvin Charles '60
Kaczmarek, Richard '73
Keller, Norman Kurt '58
Labianca, Frank M. '61
Sindel, Fred Hans '59
NY H Bergh, Gerald Kenneth '58
Filipek, Stephan John '82
Goodman, Alvin S. '44
Kern, Frank John '70
Wu, Randall '75
NY Θ Cornett, Dean Leo '71
Suran, Jerome J. '49
Thomas, John Anthony '86
Tracey, Michael Steven '86
Ziki, Ann Louise '86
NY I Cassella, Judith Ann '71
De Fazio, Michael J. '67
Grant, Richard Joseph '88
Levy, Rami C. '92
Teitelbaum, Howard A. '79
Trentacosta, Joseph D. '69
NY Λ Petsche, Frank '78
NY M Meader, Lyla Rebecca '86
Montgomery, Michael E. '75
Rest, George B. '75
NY N Barnes, Robert Edward '84
Humphrey, David K. '67
Kuberka, Gregory '80
Mann, Michael '77
NY Ξ Byrnes, Richard Dennis '83
Machuca, Luis Arthur '69
Murphy, Vincent Gerard '65
NY O Hofmann, Linda '79
Jankowski, Cecelia '81
Lumish, Stan '78
NY Π Hill, David Alan '77
Turner, Clayton Phillip '90
NY P Wong, Wai Kin '85
NC A Allen, William Dowell '88
Blair, John Ramsey '77
Capps, Dickson Michael '75
Franke, Deborah A.L. '85
Frierson III, J. Lawrence '66
Morton, Rodney Eugene '84
Teague, Lisa Jones '81
Weirs, Gregory '91
NC Γ Hovis, John Garrison '78
Prevatt III, Richard M. '77
NC Δ Daemer, Gary G. '92
ND A Fay, James Maurice '82
ND B Jesh, Mark Steven '86
OH A Beach, Robert Chester '56
Hoh, Ka-Pi '84
Koch, Carl Conrad '59
Kownacki, Edward J. '67
Oblak, John Michael '62
Schuerger, Thomas R. '50
OH B Allspach, Eugene R. '70
Dobashi, Harry Hideo '68
Olt, Richard A. '80
Robinette, Lisa Marie '03
Ruebusch, Robert J. '70
Spires, Richard Andrew '84
OH Γ Carr, Stephen J. '70
Frey, Mary Ellen '89
Heath, J. Allen '78
Johnston Jr., Robert P. '67
March, Michael Ross '85
Marsolo, Keith Allen '02
Pladars, Valts '56
Price, Ted Walter '59
Riedel, Nelson Andrew '67
Risch, Gary Allan '76
Robinette Jr., William H. '68
Schroeder, Michael Alex '95
Stumbaugh, Gary Allen '66
OH E Derkaschenko, Alex '74
Duscha, Rudolph Albert '59
Evans, John Arthur '59
OH Z Babula, Maria '89
Busbey, Bruce C. '84
Dembrow, David Alan '82
Folgate, Kent Roland '58
Herman, Madison R. '13
Rober, Kenneth Jerome '68
OH H Breuder, Andrew J. '70
Clarke III, DeFrance '81
Freyer, Gustav John '60
Hager, Douglas Scot '85
Kelso, Thomas Sean '88
OH Θ Evanzia, Gregorio P. '64
Kramer, Lawrence J. '62
Usleman, Robert T. '71
OH I Larson, William Jed '75
Schilling Jr., Walter W. '97
OH K Carver, Robert Michael '87
Maki, Luke Richard '78
Wielopolski, Richard J. '76
OH Λ Chegar, John Thomas '90
Gwin, Russel W. '85
Suhar, Richard Allen '83
Tirpack, Mark Andrew '81
OH M Montgomery Jr., W. Lee '86
OK A Brown, Leslie Wray '70
Burton, Donald O'Neil '71
Dotson, Neil A. '84
Hardy, William C. '53
Hysinger, T. '63
Wustenberg, John W. '84
OK B Sherrill, Shirley W. '82
OK Γ Dean, Philip Maxwell '74
OR A Buxton, Charles Edward '62
Miller, George Edward '77
Sato, Ben '57
Sias, James Frederick '57
Stranahan, Chapman A. '65
PA A Hughes, Michael Rice '87
Knox, Robert Seiple '53
Lasser, Howard Gilbert '50
Lynch, Sarah Hayward '89
Marshall, Steven John '82
Melvin, William Larkin '89
O'Hara, John James '73
Ortlieb, John Richard '53
Pondo, Fredric '75
Vosseller, Kenneth F. '62
PA B Andrichak, Stephen M.'58
Gibson, John Parke '64
Kardos, John Louis '61
Kolivosky Jr., John E. '92
Matthias, Tracey Dawn '89
McNair Jr., Irving M. '54
Smith, Randy Earl '84
Weston, Matthew W. '93
PA Γ Chang, Yue Cathy '00
Marietta, William Grey '68
Riedel, Frederick W. '68
Rudolph, Anna Jane '79
Wierzbicki, Jeannette M. '80
PA Δ Black, David L. '83
Lewis, Timothy '64
PA E Amman, Richard Walter '64
Coffey, James M. '75
Cook Jr., Eugene M. '58
Guest, Frederick C. '59
Kulicki, John Milton '65
Rodite, Robert R.R. '64
Ryan, Richard Edward '86
Yoder, Paul Eugene '49
PA Z Aepli, Theodore Carl '62
Mergel, Joseph John '72
Anonymous '84
Silvasi, John J. '70
Thomas, Jeffrey R. '65
Weggel, John Richard '64
PA Θ Dever, Patrick Brian '94
Diener, David E. '67
Fozo, Geza '63
Girondo, Dominic Peter '70
Kneidinger, Carl F. '70
Lacz, Walter '69
Ryan III, Arthur Peter '65

CHI CLUB CONTINUED

Threston, Joseph T. '57
Warczyglowa, Clarence '76

PA I Dehoff, Gregg Alan '86

PA Λ Anselm, Gregory Alan '81
Fitzpatrick, Anthony R. '03
Janocko, David Jeffrey '81
Musselman, Thomas A. '73
Taylor, Thomas Ray '73

PR A Hilerio Sanchez, Josuan '07
Perez, Juan A. '78
Ramirez, Miguel Angel '73
Sanchez, Hector Luis '76

RI A Clarke, Edward Nielsen '45
Foster, Nigel John '81
Fradkin, Henry Edward '68

RI B Aubin, Timothy Francis '94
Hurdis, David Albert '62
James, Charles Franklin '58
Lamoureux, Suzanne M. '82
Lieberman, James '67
Verrier, Donald Charles '54

SC A Brown, David A. '66
Di Lapi, Christine Marie '87
Drennan Jr., Robert F. '70
Gray Jr., Blaine Edward '72
Hunter, James Richard '85
Mims Jr., Paul Wilson '71
Rast Jr., Heber Edward '63

SC B Lang, Christine Marie '80
Massey, Kristina Logue '71
Walden, Gary R. '81
Wilson Jr., Robert L. '69

SC Γ Gooley, Thomas Joseph '55
Gustafson, Richard A. '63
Marbois, Matthew C. '81
Reed II, Henry M. '60

SD A Beck, Carl William '83
Case, Robert Howard '75
Kroetch, Christopher '06
Shoup, Heather Zarie '95

TN A Davis, Wayne Thomas '73
Evans, Colby Russell '94
Hunt, Roy Joe '67
Jackson, Karen E. '81
Layman, Ronald Terry '77
Meriwether, George H. '74
Moore, Terry M. '67

TN B Burnett Jr., Wilton W. '67
Morton, Wayne King '63
Pulley, Debra Domino '78
Zabriskie, Kenneth A. '80

TN Γ Dooley, Joseph Brooks '70
Thompson Jr., W. W. '68

TN E Nolte, Jennifer Jan '77
Nolte, Paul Allen '77

TN Z McGlumphy, Jonathan '02

TX A Abad-Fitts, Carmen B. '80
Courtney Jr., Lonzo C. '58
Crippen, Robert L. '60
Edgar, Arlen Lewis '57
Garrett, Darrel Wayne '70
Hogan, David William '69
Horton, Larry Earl '83
Howerton, Lloyd F. '51
Kassler, Harlan Larry '91
Peet, Ed '69
Peterson, Robert A. '80
Stanley, William Robert '94
Whitesides Jr., John L. '65

TX B Boyd, Suzanna Ruth '81
Hoiberg, John Arnold '64
Johnson, Mark Sheldon '74
Nall, Albert Arnold '81
Newkirk, Todd Leland '87
Rossler, Steven Wayne '73
Soules, James Gregory '79
Walter, Kevin Carl '88
Williams, David Charles '47

TX Γ Fisher, John David '70
Horn, Kenneth Porter '61
Lodal, Jan Martin '65
Maxfield, Robert Roy '64
Smith, Fred Lewis '62

TX Δ Armstrong, Bryan M. '95
Brittan, Charles Laury '65
Fink, Tami Neal '91
Herring, Robert Lee '65
Kramm, Robert C. '81
McGinnis, Charles I. '49
Muldrow, Grady M. '89
Smith, Manning DeWitt '64
Wilson Jr., Edmon D. '57

TX E Hillegeist, Reynold Ben '63
Lim-Smith, Yee Lan '82
†Power, L. Douglas '66
Smith, Kevin George '81

TX Z Broussard, Lance A. '97
McCaleb, Jesse Earl '64

TX H Godwin, Albert Eugene '84
Hightower, Janice M. '67
Hoffman, Heather B. '92
Schaeper, Wilfred H. '76

TX Θ Chee Fong, Maria D. '91
Fong, Keith Batchelor '88

TX K Daniels, Jerry D. '79

TX Λ Carter, Jason Oliver '87
Carter, Norhanani B. '87
Garcia, Danny '85

UT A Malmquist, David A. '62
Patrick, William Moss '74

UT B Thompson, James R. '76

UT Γ Torgesen, Greg Lau '80

VA A Conway Jr., George F. '70
Mac Glashan, Donald '57
MacKay-Smith Jr., A.'59
Mizelle, Peter Privott '60
Roesch III, Maurice A.'78

VA B Bucklen, Okley Bert '59
Detterman, Robert L. '53
Hanley, Thomas R. '67
Mann, Richard Jeffrey '75
Powell, James Davis '77
Smith Jr., Sidney C. '63

VA Δ Brenner, Joseph R. '55
Michael, Glenn P. '66

WA A Brewer, Brian J. '82
Bullock, Dennis Eugene '76
Chandler, Alan Scott '77
Hulsizer, Stephen A. '69
Kinell, Donald Karl '64
Larkin, Robert Semple '61
Orr, Peter Courtney '71
Otteman, Lloyd Gilbert '54
Strickland, Elizabeth A. '77

WA B Hyde, Gary M. '64
Large, Robert William '60
Nemitz, Rodney E. '86

WV A Lilly, Larry Joe '64
Skujins, Margaret S. '69
Skujins, Ojars '68
Spence, Peter Larkin '80
Tompkins, Joseph A. '77

WI A Cattoi, Robert Louis '50
Goba, John J. '66
Hoffman, Carl A. '85
Johnson, Joseph W. '79
Martell, Donald Louis '60
Schuh, Peter O. '63
Senty, James Anton '60
Shimko, Darl Vann '79
Stickles, Kenneth '67
Thomas, Richard H. '63
Trnka, John Thomas '69

WI B Bauer, Kurt Walter '51
Delgado, José Manuel '69
Donovan, Dennis M. '67
Dschida, Linda Maria '82
Erftmier, Roger Alan '63
Marcouiller, Roger A. '60
Wolf, Thomas Francis '59

WI Γ Formella, John Patrick '81
Stachowicz, Robert W.'70

WY A Dwan, Terrence E. '68
Riley, Robert Hugh '82
Simon, Ronald Wayne '81

SECOND CENTURY CLUB

AL A Essing, John Earl '67
Grantham, Ronald Joe '77
Malseed, Robert Allen '77
Shivers, Charles H. '75

AL B Carr, Emily Corinne '77
Sparks, Dina Lou '80
Vickers, William Korth '88
Wood, Megan Renee '18

AL Γ Guest, James Mark '89
Jacobs, James Ralph '86

AZ A de Shazo Jr., Thomas E. '62
Mahr, Eric Michael '97
McSpadden Jr., William '56
Smith, William G. '78
Tretschok, Cody D. '89

AZ B Harary, Robert Mark '82

AR A Magness, Joe Donald '55
Moody, Charles Roger '58
Reed, John Lee '68

CA A Rae, James William '52

CA B Andelin Jr., John Philip '55
Lalli, Stephen John '86
Scandella, Carl John '66

CA Γ Brown, Stephen L. '58
Holsinger, Kevin Karl '84
Miller, William C. '50

CA Δ Bolliger, James E. '71
Kester, Larry Arthur '78
Rey, Daniel '66
Van Der Laan, William '62
Yamashiro, Keith Kotsu '79

CA E Argabrite, A. Hugh '53
Axt, Robert Donald '66
Forman, Barry Joel '60
Satorius, Edgar Harry '70
Ssutu, Louis '65
Walker, David Allen '78

CA Z Blaney, Timothy John '86
McGuire, John Patrick '58
Sabbatini, Julian '68
Sako, Mitchell E. '79

CA H Blythe, Kelly Richard '93
Costa, Michael '88
Lopez, Jeffrey Asuncion '06
Thurston, Jeannie Lynn '77

CA Θ Asahina, David Takashi '78
Carpenter, Gordon Lee '49
Gilman, Larry '73
Nguyen, Tam Thanh '81
Stone, Ronald E. '66
Wiering, Larry Arthur '77

CA I Dembegiotes, Pantele '84

CA K Taylor, Robert Derek '82

CA Λ Fujitani, Paul Edward '79
Reynolds, Hugh M. '69

CA M Empey, Daniel Martin '82
Sass, Forrest Lee '73

CA N Caballero, Luis Alberto '85
Darlington, William E. '66
Johnson, Michael R. '86
Rheinhardt, Mark E. '84

CA Ξ Smith II, Gordon F. '97

CA O McGuire, Phyllis Ann '80

CA P Sullivan, C. Bart '86

CA T Lotocky, Daniel A. '84

CA Φ Bobbitt, Kelle Allen '92

CO A Devoe, Tracie Kay '82
Gibbs, Julie Forrest '80
Ralph, Pierson M. '48
Stratton, Joan Victoria '74

CO B Castleman, Curtis H. '67
Joselyn, Jo Ann '65
Kannolt, James Rodger '58
Trimbell, Thomas S. '70
Velazquez, Jose F. '78

CO Γ Conway, Kent Waldo '52
Ton, Scott Marshall '74

CT A Hoffmann, William H. '50
McEligot, Donald M. '52
Shank, Richard Ralph '48
Zydney, Andrew L. '80

CT B Barnsbee, Clive Dennis '56
Dembiczak, Gerald J. '74
Gareau, James Peter '93
Greene Jr., Joseph Fred '53
Grossman, Richard L. '69
Sobol III, Anthony J. '70

CT Γ Godbout, Louis Francis '72

DE A Rae, Kirk Alfred '88

DC A Amisial, Wilfrid Jean '71

DC Γ Laguarda, Leonel '79
Lintner, William Anton '82
Potterton, Richard Lee '60
Wilhelm, Eugene Bailey '86

FL A Gunter, Alan Dale '79
Hines, John Stanley '63
Marko, Paul David '81
Militello, Sam '61
Pitt, Gary Alvis '70
Wabbersen Jr., William '90

FL B Berman, Gerald Adrian '55
Holmes, Martin E. '82
Nunez, Ramon Luis '75

FL Γ Pennington III, John '71
Suter, Bruce Wilsey '72

FL Δ Bradshaw, Robert H. '77

FL E Sinibaldi, John Claude '85

FL Z Seip, Ralf '90
Stewart, Robert Glenn '84

FL Θ Leon, Felipe Antonio '99

GA A Curry Jr., John Charles '58
Flegal, William Malcolm '66
Glover, Edmund Cook '60
Gumm, Milton Sherman '67
Hedrick, A. Fred '69
Jaklitsch, James Joseph '80
Priest, Anthony James '88
Schueler, William F. '72
Tyler, Stephen M. '84

ID A Harris, Walter John '82

IL A Baumgartner, Richard '69
Davis, Stephen Robert '63
Fisher, Robert Lee '80
Kraft, Donald Edward '52
Miller, David Archer '61
Mueller, Vernon C. '59
Picus, Joel '79
Reichelt, Karl L. '68
Rosenthal, Mark Alan '81
Tonelli, Arthur Duane '57

IL B Thomas, Robert James '82
Ziomek, Arkadiusz '10

IL Γ Christopher, James M. '84
Puscher, Wilfried Alex '74
Rauh, Donald Albert '70
Rivera, Angel Luis '80

IL Δ Kraatz, Roland Lee '65
Toon, James Bertram '87

IN A Alexander, John Albert '56
Bein, Thomas W. '80
Beuchel, Patrick T. '81
Brumund, William F. '64
Cunny, Robert William '46
Dillard, James Orland '77
Eykamp, G. Richard '56
Hedegard, Alan Harald '64
Hibbard, George Lewis '65
Horneys, David Chris '53
Karrenberg, Hans Karl '54
Kawaguchi, Ray S. '69
Lee, Robert Edward '67
Lin, Jeffrey Eugene '97
Monical, R. Duane '48
Moore, Darrel Daniel '64
Mucha, Thomas Jerome '60
Newby, Karl Eugene '82
Peak, Steve Charles '71
Rieter, Robert F. '65
Smigielski, Thomas S. '65
Walker, Neil Renz '69

IN B Galler, Stephen F. '05
Jones Jr., Thomas G. '49
Matsuda, Fujio '49
Pauls, Jeffrey Dale '79
Stant, George Robert '76

IN Γ Bajura, Richard Albert '62
Bongiovi, Robert Paul '69
Schanning, Brian Peter '68
Yogan, Thomas James '82

IN Δ Zendzian, Daniel D. '95

IN E Hasbrouck, Christie R. '16

IA A Anders, Bryce Leroy '67
Brunk, James Everling '48
Gallagher, Richard F. '59
Haack, Leland Arthur '53
Irvine, Alexander John '79
Matheson, Harold M. '55
Rush, David Grant '85
Ryken, Mike Jon '96
Watson, Stephen Louis '67
Weiss, Verne Eugene '59

IA B Braet, Ronald Lee '63
Sears, Larry Mac '61

KS A Gerren, Donna Sue '90
Lovitch, Dinah '88
Peters, Paul Eugene '57
Struble, Philip William '79
Tackman, Norbert Ellis '61
Taylor, James Theodore '52
Vaughan, Charles F. '77

KS B Barkell Jr., James W. '74
Stuart Jr., James F. '67

KS Γ Roberts, Thomas Carrol '70

KY A Blevins, Parker Ray '64
Freeman, Richard E. '73
Goerz, Jerry Walter '75
Patton, Bradley D. '76

KY B Moore, Richard William '71

LA A Champagne, Sidney A. '68
Chenevert, Edward L. '67
Comardelle, Jeremy N. '01
Miller Jr., Frank C. '62
Slade Jr., Bill Ernest '61

LA B Lazarus, William B. '79

ME A Johnson, Philip Martin '55
Laskey, Henry Lindon '51
Mortenson Jr., Victor '70
Whitten, Donald Lee '57

MD A Aaron, Nelson Harris '80
Beatty Jr., Millard F. '59
Burroughs, Matthew O. '63
Cummings, Lori Lynn '83
Dryden, Thomas E. '79
Gift, Elwood H. '54
Gormley, Paul Edward '68
Hartlove Jr., Charles L. '76
Levine, Jeffrey Scott '85
Piedrafita, James L. '78
Sutera, Salvatore Philip '54
Ver Valen, Henry Clay '73

MD B Cederman, Candace A. '82
Deschere, David S. '82
Errera, David R. '75
Galloway Jr., John P. '73
Gillum Sr., Michael J. '91
Kulstad, Erik Benjamin '92
Leasure Jr., William A. '66
Lenhoff, Carl Edward '65
Mitchell, Reginald H. '72
Ornett, William S. '59
Poulter, Harry David '88
Richman, Howard Ross '91
Sacks, Herbert K. '64
Stewart, Larry Edwin '60
Tracy, Anita Lynne '89
Wahl, Bill Floyd '82
White, Anthony Albert '95

MD Γ Hauge, Todd Allen '83

MA A Andel, Robert Matthew '73
Brown, Mark William '82
Burgarella, John Paul '50
Cannon, Lewis Stephen '82
Haringa, Glenn E. '74
Proulx, Thomas Joseph '92
Wielk, Michael C. '86
Wright, Neal Timothy '76

MA B Buncher, Charles Ralph '60
Colavita, Michael Mark '81
Delagrange, Arthur D. '62
Hui, Anthony Y. '00
Liepins, Atis A. '57
Mleziva, Matt Louis '65
Nelson, Percy Lyon '47
Rogers, Peter Todd '82
Smith, Kenneth Alan '58
Smith, Thomas L. '67
Weinberg, Marc Steven '70
Woolling Jr., Kenneth '71

MA Δ Blesso, Thomas Neal '73
Day, Anthony Frank '65
Fifer, William Clifford '57
Ingalls, David Peabody '51

MA E Chiodo, Richard A. '71
Fernald, Wayne D. '70
Le Rette, William E. '92
Riccio, Michael Joseph '70
Sarafinas, Aaron '82
Soulis, Wilbur Taggart '72
Thompson, John W. '72
Truxel, George Henry '68
Vesce, Paul James '64

MA Z Beliveau, Thomas J. '69
Benwood, Bruce Robert '69
Cooper, Perry A. '62
Costa, Bruce A. '79
Stumpf, Christian R. '82
Vivaldi, Isadore Louis '52

MA H Daniels, Susan Carol '81

MA Θ Furlong, Kim Marlene '87

MA I Schreiner, Steven '86
Smith, David Robert '87
Walczak, Raymond '74

MI A Brewer, Frederick E. '57
Cameron, John Howard '68
Lowry, Peter A. '60
Othmer, Hans George '65

MI B Dykema, Adrian Henry '44
Knutilla, Robert Lloyd '51
McNeil, Michael T. '86
Rom, David Bruce '56
Sauer, Daniel Michael '05
Stamm, John Andrews '61
Weber, Scott Charles '88

MI Γ Bigelow, Wilbur C. '44

SECOND CENTURY CLUB CONTINUED

Blair, David John '57
Gerdes, Walter '58
Harris, Frederick Allan '64
Hensel, John Charles '52
Lambert, Thomas J. '77
Lempke, James Donald '83
Pace Jr., George Donald '61
Pulley, Craig Martin '78
Vaughn, Wayne Allen '73
Williams, Dean Stanton '61

MI Δ Brining, Dennis Wayne '68
Dauerer, Walter Peter '60
Gallagher, James A. '68
Kaunelis, Pranciskus S. '69
Kelly, Gary Michael '64
Schalk, Eugene N. '55

MI E Billion, Godwin Paul '75
Capraro, Michael A. '70
Czarnota, Paul Steven '86
Jerome Jr., George G. '94
Klaetke, George H. '55
Sieg, Mary Henderson '77

MI Z Lenz, Ronald Lee '81
Ricker, Jonathan Bruce '97
Verhoff, Stephen John '00

MI Θ Kanfer, Marvin Eliot '71

MI I Maue, Susanne C. '92

MN A Halladay, Henry E. '64
Hess, Craig Allen '72
Lucking, Rachel Mary '85
Magney, Mark Charles '79
Oss, Don Gordon '58
Sanders, Ivar '68
Smits, Talivaldis Ivars '59

MS A Bell, Charles Vester '56
Bui, Tuan Thanh '90
Clements, Nathan Scott '96
Douglass, Thomas E. '58
Dowdle, Walter Lynn '67
Freeman, L. Michael '71
Young, Matthew Jared '11

MO A Adams, Charles Ray '65
Baker, Gerald Marion '63
Fairbanks, Robert W. '62
Kuehnel, Charles George '62
Potter, Charles Jarrett '71

MO B Elfrink, Lindell Herman '62
Hendrickson, Richard C. '53
Lytle Jr., Glenn Alden '66
McJimsey, Edward Clair '71
Rosser, Robert Jeffrey '85
Saperstein, Lee Waldo '64
Steele, James Dean '66
Willoughby, Ronald D. '73

MO Γ Eddy, James Dale '80
Lingren, Terry Dale '80
Swallow, Louis John '54
Weber, Walter Herman '48

MT A Ausmus, Guy Howard '78
Kujawa, Stephan T. '73
Peck Jr., Delbert Emery '77

NE A Iwan, Russel Ray '81
Shanmugam, Alagappan '83
Van Skiver, Max Alan '75

NV A Ericksen, Spencer Lee '99
Reynolds, Roger Smith '65
Van Horn, Michael D. '76

NJ A Barrese, Anthony Louis '70
Carucci, Vincent A. '69
Denzer Jr., George C. '61
Newton, Thomas Joseph '58
Swanson, Frederick J. '68

NJ B Andre, Gerald R. '75
Emmons Jr., Harry L.R. '40
Feder, Gerald Lewis '86
Masaryk, Joseph S. '67
Renkart, Brandon M. '08
Richards, John Reed '76
Valk, Stephen B. '77
Viechnicki, Dennis '62

NJ Γ Balma, Peter Michael '75
McWilliams, John Paul '65
Paone, Charles Joseph '66
Reznak, Frederick John '69
Spinnler, Gerard Francis '75
Tabor, Vincent Joseph '75
Thompson, Susan M. '92

NJ Δ Adrignolo III, Anthony '89
Cole, Peter Preston '72
Nash Jr., Raymond A. '60
Shaw, Michael Miller '82
Whitesides Jr., Lawson '68

NM A Aragon, Frank Garcia '77

NM B Gallegos, Floyd Richard '82

NY A Lawson, Derek Michael '09
Mullervy, John '00
Paparis, Bill '75
Seader, David '67

NY B Baleno, Anthony Paul '66
Demyanovich, Sara E. '85
Glaser, Anthony Joseph '51
Gorey, Anthony George '84
Leader, Margaret Ellen '85
Prykull, Cory James '15
Ragonese, Louis John '56

NY Γ Brenneman, Scott A. '83
Diefenbacher, Robert H. '59
Jennings, Robert Edgar '63
Krause, Alfred Frank '52

NY Δ Goldstein, Steven Mark '81
Hodgson Jr., Edward W. '68
Johnson, William C. '54
Logan, Joseph Skinner '56

NY E Barto, Thomas Peter '70
Einson, Stephen Edward '59
Jaasma, Edward George '59
Lokenberg, John A. '69
Markatos, Louis G. '65

NY H Filippi, Allan John '72
Welk, William '79
Wolf, Murray '48

NY Θ Berlat, Norman Robert '62
Dec, Eugene Bernard '72
Godlove, Katie Ann '02
Grubb, Michael Alan '78
Harris, Everette C. '76
Newman, Mitchell James '81
Periard, James Richard '81
Powelson, David E. '78
Randall, Paul William '92
Thiemann, Peter Ernest '79
Wells, Eugene Francis '50

NY I Boehm, Robert Andrew '79
Gallo, Anthony Michael '76
Hartmann, Hans Gustav '70
Le Mée, Jean '59
Millman, David Seth '72
Weinberg, Aaron '69

NY K Bailey, David Alan '84
Muller-Girard Jr., Otto '89
Saucke, Alfred William '60

NY Λ Mizzi, John Vincent '63
Novakoff, Alan K. '74

NY M Bunk, Donald Samuel '55
Charlton, John William '62

NY N Feldman, Scott '75
Irwin, Christopher J. '92
Anonymous '91
Pardini, Thomas John '77
Theoclitus, David T. '86

NY Ξ Boyle, Charles J. '76
Defelice, Nicholas James '77
Taylor, Maryanne B. '80

NY O Fleming-Dahl, Arthur N. '80
Kadysiewski, Stephen J. '76
Lamberg, Michael Jay '83

NY P Lau, Soon '85

NY Σ Smith, Jason Stephen '95

NY T Venable, Richard Robert '95

NC A Bishop, Ernest A. '73
Cline, Arthur Austin '49
Cutchin IV, James M. '62
Norville, John Albert '58
Olds II, John Robert '87
Palmer III, Jacob A.'69

NC Γ Behnken, Kenneth C. '67
Leo, Perry Howard '81
Peters, William Thomas '59
Wine, Charles Joseph '59

NC Δ Clark, Michael J. '75
Dempsey, Gary Lee '82

ND A Kallis, Adrian G. '88
Sack, Larry Elroy '59

OH A Bracy, Kevin Norman '93
Cares, William Ronald '63
Diederich, Norman F. '64
Erdelsky, Philip John '66
Kimmel, Paul Robert '69
Proctor, David George '52
Triznadel, Norman T. '60

OH B Avellano, Michael A. '85
Bach, Wayne Stephen '72
Bulcher, Thomas J. '76
Henderson, H. Thurman '58
Lockard, Chad William '01
Mayer, Robert L. '69
McCune, Larry Clinton '63
Nilsson, Nils Eric '71

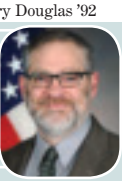
OH Γ Chadwick, Harold E. '65
Choyke, Wolfgang J. '48
Milder, Nelson Louis '59
Shade Jr., W. Norm '70
Zelasko, Stanley J. '74

OH Δ Miller, Rodger Kinnear '65

OH E Boulter, Brian Thomas '91
Dirks, Douglas Alan '83
Harrold, James Leon '91
Kuczmarski, Maria Ann '84

OH Z Enderlen, Jeffrey R. '80
Levey, Gary E. '74

OH H Gilbert, John Ellis '70
Hahn, Danny A. '83
Hartman, Dean H. '99
Merkle, Larry Douglas '92



Larry Merkle: Inherited his love of Tau Beta Pi from his father, Douglas H. Merkle.

Niemeyer, Joseph B. '85
Piske Jr., Andreus A. '61
Wolfe, Stephen A. '85

OH Θ Decker, John William '65
Keller, Robert Lee '63
Mikalauskas, George A. '86
Sero, Raymond James '67

OH I Bennett, Dan A. '73

OH K Brattoli, Mark A. '79
Dudek, Scott Andrew '90
Stimler, Jeff Joseph '84
Volosen, John '77

OH Λ George, Thomas E. '87
Hallochak, Andrew John '77
Selak, August John '79

OH M Huff, Richard Keith '94

OK A Duke, Chris '83
Patterson, John L. '85

OK B Camacho, Roger A. '82
Hand, Ronald Wayne '72
Miller, Michael Joseph '81

OK Γ Chastain, James Curtis '07
Hanes, Larry Lewis '76

OR A Shaw, James Walter '70

PA A Bakis, Charles Emanuel '81
Donley, Shawn Thomas '71
Edwards, Alfred B. '71
Flaherty, Robert E. '68
Heffernan, Robert Booth '70
Jonas, Cynthia Joy '82
Megerle, William Georg '86
Midkiff, Alan Haywood '85
Moser, George M. '67
Muller, Eduardo E. '87
Shapiro, Michael Henry '70
Tomkiel, Stanley A. '72
Wismer, David Arthur '59

PA B Bova, Francesco Antonio '05
Bridge, David Lee '71
Fetchen, John Howard '69
Good, Michael L. '78
Harvey, John William '95
Mathason, Brian Keith '92
Mayers, Douglas L. '74
Ruth, Donald Lee '70
Sonsteby, Jon Michael '95
Wanenchak, Michael J. '69

PA Γ Chong, Jike '01
De Paul, Louis Anthony '73
Flaminio, Herman '62

PA Δ Lang, David R. '85
Yaccarino, Robert G. '85

PA E Cimei, A. Kevin '84
Cottrell, Martin M. '67
Cross, David Wilson '67
Gentilucci, Joseph A. '53
Hartman Jr., Harold F. '56
Johnson, David Banks '83
Manoway, Dina Marie '83
Murgas, William Joseph '53
Ott, Timothy Ray '86
Schroeder, Karl Richard '49
Steel, Henry William '58

PA Z De Maio, Michael '76
Hunt, Thomas Robert '84
Kirsch, Paul Andrew '75
Wagner, William A. '89

PA H Hackman, Timothy B. '68
Noble, John William '72

PA Θ Addotta, Robert Frank '77
Braun, James Francis '84
Norris, Clinton Joseph '61

PA Λ Christian, Rob Francis '07
Domhoff, Edward Scott '91
Hovanec, Andrew S. '58
Kulik, David Benedict '83
Tjader, William Stephen '79

PA M Nicholas, Kathleen Sara '12

PR A Archilla, Joaquin '68

RI A Garrett, Scott Lee '57

RI B Kolb, Robert Allen '66
Mastrostefano, Vincent '75
Palmer, Robert Perry '59
Sirois, Herbert Joseph '71

SC A Hill, James C. '61
Marley, Brian Lee '89

SC B Hidlay, Charlene Marie '96
Lesto, Kenneth Reed '58

SC Γ Barton Jr., Robert H. '62
Guaigua, Mike Vicente '13
Lucas, William Ray '84
Watkins, Terry Leonard '73

SD A Byg, Jerald Norman '72
Eisenbraun, Daniel Dale '75
Kerk, Carter J. '81
Stieha, John Kevin '80
Zehrung, Roderick Scott '94
Broome, Joseph Carroll '65
Cashion, Gregory Lee '79
Dobrodziej, Kristen L. '08
Fee, Gordon Gray '56
Lundy, Ted Sadler '54
Moore, James Arthur '77
O'Bryan, Lynda K. '62
Pitts, Robert E. '69
Scott, Bobby Glenn '59
Sewell, John Ike '54
Taylor, David Richard '69
Utsman, Forrest Mckae '95
Whaley, Christopher L. '94
Wheatley, Hubert Carl '70

TN B Casson, Leonard Walter '81
Cummings, Becky G. '76
Hawkins, Kenneth E. '88
Kammerud, John Eric '70
Lippert, Michael John '86

TN Γ McCormick, Jack R. '64
McDonald, Gary H. '77
Moyers, Robert Lewis '05

TN Δ Halsema, Paul Bernard '81
Luttmann, Lisa M. '82
Luttmann, Mark Joseph '82

TN E Funderburk, Rodger M. '89

TN Z Keck, Christopher Clark '95
Pyle, Angela Diana '91

TX A Felton, Charles Ronald '73
Foerster, Paul Adolph '57
Huang, Lawrence Peter '81
Krieg, Raymond David '60
Lambert, Rhonda Ellen '81
Melton, Walter Curry '56
Nix Jr., Cecil Anson '57
Wales, Robert Curtis '65
Weirich, Robert Edward '66

TX B Kiesling, Ernst W. '55
Krauss, Kerry Len '72
Moss, Michael William '83

TX Γ Cronin, Robert Hillsman '65
Hobbs, William Edward '65
Wolfram Jr., William R.'68

TX Δ Bohlmann Jr., Willy F. '50
Boutte, Jennifer Lynne '89
Chaput, Armand Joseph '63
Eng, Ronald Wey '71
Johnson, Vance Clay '78
Pechacek, Ronald David '78
Skoczlas, Kenneth A. '72
Sullivan Jr., Samuel L. '57
Tipton, Dewey Ross '64
Vaden III, Frank S. '56
Wornat, Richard Oscar '49
Wright, Charles Eugene '62

TX E Brown Jr., Thomas B. '72
Smith, Nancy Crummett '74

TX H Collins, Clyde Williams '69
Johnson, Richard Leon '63
Loper, Thomas Lee '81
McBay, Michael R. '73
Tepper, John C. '82

TX Θ Goolsby, Tommy D. W. '84
Karlsruher, John C. '77

TX K Alexander, Craig Steven '88
Jolley, Lawyer Curtis '79

UT A Dommasch, Alex '90
Gehmlich, Dietrich Karl '53
Jarrell, Reese Patkin '79
Stewart, William '60

UT B Ashby, Delroy '64
Craig, Donald Dean '82
Paxton, Thornton S. '63

UT Γ Esplin, Robert Barton '04

VT A Bouchard, Donald Raoul '81
Garno, Douglas Thomas '58

VT B Melzar, Jonathan P. '85

VA A Cosby, James Gordon '61
McGhee, Kenneth H. '64
McNair, Grayson E. '62
Stansell Jr., Thomas A. '57
Sussman, Theodore D. '81

VA B Blankenship, Charles P. '60
Boward, Jill Kathleen '87
Brockenbrough, Thomas '42
Massie, Fred F. '78
Parsons, Jerome S. '66

VA Γ Lashomb, Susan Marie '83
Youssef, Mennatoallah '04

VA Δ Bunch Jr., Jennings B. '50

WA A Grant, Patrick William '75

WA B Groat, J. Everett '94
Johnson, Jeffrey M. '92
Peters, Janna Jill '99
Turi, Michael Allen '07

WV A Deakins, Ralph Richard '58
Easterling, W. Samuel '81
Johnston, John Walter '73
Schuler, Arthur Kurt '71

WV B Capozzoli, Brent S. '84
Cox, William Keith '62

WI A Cleasby, John L. '50
Cress, David Roger '63
Davis, Scott Paul '78
Devoe, Michael James '78
Flakas, Gerald Kenneth '66
Horn, Robert William '68
Jens, Barry Lee '64
Kiesling, Dean Arthur '69
Rozek, John Stanislaus '52
Suess, Manfred Edward '64
Thompson, Kenneth G. '77
Williams, Lynn Edward '67

WI B Barone, Frank J. '62
Koester, Fred William '59
Kriofsky, Tom Allan '60
Penlesky, Richard J. '73
Sommerville, Martin G. '94
Svihla, Edward Bert '61

WI Γ Beckley, Linda Kristine '88
Figurski, Mark Anthony '83
Griffin, Michael M. '93
Jendrzejek, Gary Steven '75
Otto, Michael John '76

WI Δ Sullivan, Shawn Francis '02

FOUNDERS CLUB

AL A Fitzsimmons, Timothy E. '80
Holloway Jr., Coley M. '94
Jones, Win Eugene '75
Reilly, Patrick Francis '93
Strickland, John Curtis '55

AL B Elmore, Gregory David '97

AL Γ Ingram, Eddy Lee '80
Jones, Larry Lloyd '79

AZ A Berry, Robert Lee '67
Coxon, Moran '54
Heires, Daniel John '86
Higbie, John Jacob '59
Whitlock, Charles N. '79

AZ B Ivan, William Thomas '92
Roberts, Jackson Harris '69

AR A Price, Ralph David '83
Ryles, Gary Wayne '67
Tarini, Michael James '97
Walton, Trent Avery '81

CA A Silva, Christopher P. '82
Whisler, William D. '59

CA B Bejmuk, Bohdan I. '64

CA Γ Cummings, Alan George '76
Guo, Minggang '07

FOUNDERS CLUB CONTINUED

CA Δ Thorne, Douglas Boyd '61
CA E Brenner, Mayer Alan '78
Georgeson, Duane L. '57
Hitz, Jerre Allen '58
Hritz, John Thomas '73
Mishkin, Andrew H. '80
Riggert, Eric Floyd '91
CA Z Grau, Judith M.L. '83
CA H Kolber, Gregory J. '02
Price, J.B. '63
CA Θ Hill, Lyle Eugene '69
CA I Farley, Robert P. '68
Gaz, Richard August '67
Hovland, Larry Eilers '72
CA K Gero, Jason Leon '11
CA Λ D'Albora, Emanuel Guy '77
Khalaf, Marwan Adel '92
CA M Hermanson, Glenn E. '87
Kirkpatrick, Steven E. '80
CA N Melton, Richard D. '72
CA Ξ Akers, David James '75
Munsch, William Michael '88
CA Π Chhouk, Bounmy N. '92
Moran, H. Dana '60
CA P McComb, Chris Carson '12
CA Ψ Chu, Vincent Shu-Lai '99
CA ΑΓ Rubick, Jondavid Henry '08
CO A Hodgson, Richard A. '65
O'Conor, Andrew Joseph '79
CO B Chavez, Greg Thomas '87
Okamitsu, Gregg Kimo '82
CO Δ Dallemand, Barbara L. '91
Gonzalez, Julio Jorge '91
James, Miller Boyd '92
CO Z Teigeler, Andrew Karl '07
Weingart, Margaret E. '12
CT A Sheffield, George V. '62
Watson Jr., Richard B. '73
CT B Perreault, Gregory J. '84
DE A Shade, Patrick Joseph '76
DC A Dugger, W. Emmanuel '82
Lee, Calvin '79
FL A Caraway, Sean Lee '93
Geiger, John Robert '77
Hackett, David F. '71
Rathkopf, James Arden '79
Smith, Daniel J. '87
FL B Hardin, Jake Harvey '94
FL Δ Smith, Shaina Maryann '99
FL Θ Suarez, Eduardo M. '90
GA A Allison, Patton Manuel '08
Church, Billy Ray '63
Cleveland, Paul H. '82
Hill, Stephen D. '94
Newberg, George E. '84
IL A Highland, Steven D. '68
Jansen, Mark Allen '85
Schneider, David Ray '72
Steinkamp, Diane Merna '96
IL B Burnley, Robert Todd '89
Staschke, Ralph Arthur '50
IL Γ Gamble, Robert Blount '53
Lieske, John Charles '82
Moore, Jeffrey Austin '73
IL Δ Yerby, Joel Talbert '56
IL E Hainke, Kristofer J. '96
Silich, Bert Allen '79
IN A Ayers, Peter Graves '66
Dix, Rollin Cumming '57
Harrer, Robert Daniel '70
Kerber, Ronald Lee '65
Kercher, David M. '58
Koskie, R. Edward '52
McKinney, Leon E. '82
Richeson, Dale Eugene '84
Rude, Ronald Gregory '63
Sufana, Charles R. '74
Trickle, Chris Michael '13
Vanderheyden, Greg P. '80
Wolber, Raymond W. '80
IN B Roll, Richard Russell '81
IN Γ Geer, Ivan Daniel '94
Geist, John Michael '66
Zavesky, David J. '80
IN Δ Bolur, Adam Reza '02
Kretzmann, John Albert '73
IN E Hosack, Mack B. D. '88
IA A Bridges, Harold Ray '65
Hegg, Bob Allen '66
Kurr, Amy Catherine '18
Milliman, Mark Lance '86
Rockne, Allan Kert '66
Romig, Bernard Edwin '59
Schebler, Michael John '69
Stratmoen, Todd Noel '88
Tekippe, George L. '69
IA B Mitchell, David James '94
KS A Barr, Deborah Susan '81
Batchman, Theodore E. '62
Simpson, Trent Alan '89
KS Γ Hayter, Sheila J. '90
Miller, Laurence F. '64
KY A Buemi Jr., Joseph M. '74
Cates, Terry Duane '83
Heaberlin, James Leslie '56
Walker, Roger Denton '70
KY B Fleischer, Donald M. '79
Gray, John H. '75
Reynolds, Joseph C. '48
LA A Evans Jr., Alfred W. '51
Gautreaux, Paul Joseph '91
Petitbon, John B. '86
Shoemaker, Harry L. '69
Vora, Suresh M. '73
Wolf, Henry Bernardo '67
LA Γ Mercer, Audley A. '59
Nugent, Larry Edward '61
Whittekin, William D. '63
LA Δ Gautreaux, Craig A. '79
Hoffman III, William C. '84
LA E Diliberto, Marcella D. '03
ME A Hackett, John Arthur '59
Lamoreau Jr., Earl B. '86
MD A Horowitz, Harvey Allen '63
Kotrosa Jr., John E. '92
Pribitkin, Edmund '82
Witten, Louis '41
MD B Brouns, Daniel Robert '83
Brundrett, C. Phillip '66
Cascio, Horace Eugene '77
Freedman, Earle S. '50
Shearman, Randall J. '85
Zukor, Dorothy Jean '80
MD Γ Ernst, Charles M. '61
Weinert Jr., William E. '83
MD E Igwulu, Ifeanyi '07
MA A Carlson, Ronald Arthur '60
Goodhue, William D. '71
Irwin, Michael Joseph '75
Menard, Paul Russell '75
MA B Dessner, Herbert '52
Fuhrman, Linda Robeck '86
Lim, Pean '85
MA Δ Curless, Richard Walter '66
MA E Laios, Takis '78
Lynch, Robert Thomas '61
Marzetta, Aldo L. '68
Root, Christopher E. '82
MA Z Fennessey, Neil Merrick '83
Jeanes, David Charles '73
MA Θ Craven, McCharles A. '91
McNally, Michael W. '85
MI A Amar, Jack Joseph '73
Lipsitt, Harry Allan '52
Moravek, Michael J. '78
Suchyta, Paul Joseph '08
MI B Campbell, Edwin H. '64
Gosling, Christopher D. '79
Hupy, Craig Allan '83
Johnson, David Norton '66
MI Γ Harris, Peter V. '58
Hubbell, Thomas W. '71
Robbins, Robert R. '64
MI Δ Cerquone, Peter F. '61
Sommerfeld, Jude T. '58
Williams, William Brown '55
MI E Klotz, James C. '01
Walton, Gregory Francis '71
Yarne, Victor Carl '68
MI Z Forest, Thomas Michael '87
MN A Brasket, Richard G. '58
Han, Keesook Julia '91
Koch, Lynn Janette '83
Lemke, John David '88
Malin, Wendell R. '59
Prickett, Gordon Odin '58
MS A Chou, Teri Gale '02
Cleveland, William P. '10
MO A Bade, Darrell Dean '73
Carlock, Jon Marion '71
Vetter, Louis Hugo '62
MO B Etling Jr., Norman G. '73
Hord, William Eugene '59
Spirk, Donald Edward '65
Underwood, Mark Lee '91
Weinkein, Katie Mae '03
White, Kimberly E. '94
MO Γ Favre, Mark Edward '98
Kline, Samuel Aaron '94
Payne, Bradley A. '87
Rittmann, Bruce Edward '74

Bruce Rittmann: No organization is better at promoting engineering excellence than Tau Beta Pi.

MT A †Jeffries, William Raine '42
Penberthy, John Thomas '75
NE A Cox, John Dean '85
Matthews, Deborah Jo '82
Silver, Harry Irvin '71
NH A Gitschier, Herman J. '68
Morash, William Angus '77
NJ A Amato, Corrado '76
Daugert, Richard David '88
NJ B Rocca, Jeffrey John '78
NJ Γ Budzyn, Ludomir A. '90
Gumann, Ronald John '76
Hampel, Daniel '53
Kuchner, Robert A. '69
Lepore, Lawrence J. '74
Loney, Norman W.'77
NM A Dietzman, W. Bruce '71
NM Γ Johntony, Jason Paul '10
NY B Tucci, Patrick Anthony '72
NY Γ Buell, Richard Edward '72
Canavan, Kevin Joseph '92
Kellis Jr., Robert F. '78
Peltz, Adrienne Nicole '07
Raphael, David Victor '00
NY Δ Schumacher, Raymond '48
Willis III, William T. '66
NY E Ambrosini, Ronald F. '70
Lemp, Ronald Alan '73
Torigian, Andrew '60
NY Z Gold, Harris '58
Levine, Howard Stanley '63
NY H Fautale, Charles '63
Marino, Anthony Louis '77
Palazzo, Cosimo J. '60
NY Θ Adair, James Leonard '83
Atkinson, William Clark '70
Saviz, Camilla Margaret '87
NY I Sullivan, Roger Kent '63
Wilkowski, Stephen '80
NY K House, Mary Anne '93
Leidig, Carl Frederick '85
NY Λ Leonardi, Thomas S. '72
Schirripa, Robert Rocco '70
NY N Dressing, Thomas G. '90
Dristy, Mark Edward '85
Markunas, Justin K. '01
Prosser, Neil M. '81
Roe, Kevin Peter '94
Sunday, Bonnie '84
Watkins, Matthew Ace '05
NY P Ferreira, Antonio M. '97
NC A Ellington, Barry Todd '86
Fox, Bruce Martin '76
Skipper, Julie '81
Skipper, Lee Roy '82
Troxler, Robert Ernest '83
Willis, John Keith '78
NC Γ Lemel, Page Howe '84
NC Δ Goodwin, Edward C. '89
Sanders, Miriam Louise '80
ND A Connelly, Donald P. '64
Gerogeorge, John G. '85
Kittock, Mark Joseph '85
Nelson, Lyle David '58
Wahlgren, Jon Michael '96
OH A Andersen, Kayla Brooke '17
Herman, Zelek Seymour '67
Lesco, Daniel James '62
OH B Curless, Richard A. '68
Guckian, John E. '77
Russ, Daniel Joseph '73
Schoo, Donald Clarence '60
Shoger, Kristen Todd '97
Steiger, Gene Paul '57
OH Γ Jordan, Sarah Elizabeth '99
Neal, Richard L. '64
Yates, Glen Bernard '52
OH Δ Ballinger, Charles W. '72
Felton, Stephen Scott '70
OH Z Kristie, Frank Martin '72
Sattler, David Vincent '69
Steinmiller, Robert C. '67
OH H Heaton, Mark Campbell '90
Spinelli, Chris John '05
OH Θ Beach, Nathan '03
Kamm, Irmin Otto '54
Marks, Steven James '85
Rose, Thomas John '56
Trovato, Joseph A. '71
OH I Chelmins, David Thomas '08
Lehnert, Andrew B. '63
Liesner, Kevin Ralph '84
Matsick, Stephen Welsh '73
OH K Schwendeman, John Leo '88
OH Λ Repko, Raymond '77
Slovasky, Mark Stephen '85
Smith, Michael Angelo '92
OK A Bley, John Howard '73
OK B McKinley, Gordon S. '90
OR A O'Brien, Robert Merle '56
PA A Barnett, Bob Coulson '64
Godshall, H. Lynn '62
Irwin Jr., Richard Webb '51
Lucadamo, Gene A. '71
PA B Deluca, Bob Michael '70
Hemler, Robert Joseph '70
Kalasheh, Amir Samuel '09
Lawrence, Ann I. '82
McNally, Dianne Jean '85
Strickler, Daniel B. '57
Trautz, Todd Joseph '07
PA Γ Fugate, David W. '84
Kaplan, David Seth '03
PA Δ Lucas, Jay Philip '69
Silnutzer, Norman Roy '67
PA E Frabizzio, Michael A. '96
Stibitz, Mark Carl '87
PA Z Daly, Thomas Patrick '85
Robinson, William A. '62
Strieffler, Frank H. '91
Wagman, Sander Robert '61
PA H Cooper, Robert Hewitt '53
Sweetman, Denman J. '60
Waldner, Harold E. '58
PA Θ Capuzzi, Angelo Michael '71
Capuzzi, Lynda Ann '71
McMahon Jr., William A. '63
Sawyer, Stephen Gerard '65
Stilley, Thomas E. '83
PA I McClellan, Karl R. '80
Meixner, Henry Martin '67
PA Λ Matey, John Gerald '78
Needy, Kim LaScola '84
PR A Bird, Hector Manuel '79
Ortiz-Casasus, Manuel '92
Vazquez, Veronica '87
RI B Vandeputte, Richard M. '69
SC A McMullan, Richard J. '91
SC B Steudel Jr., Edward M. '64
SC Γ Marcuson III, William F. '63
SD A Baker, Gary Allen '72
Mead, S. Edward '62
Pirner, Steven Mark '72
Weinacht, Daniel Joseph '84
Wiesner, Brady Neil '09
SD B Oster, Zachary James '07
TN A Jackson, Robert Harris '59
Kaley, John Straud '01
Lambert, William Mark '91
Ottinger III, Aurelious '87
Rochat, Raymond A. '57
Smith, Larry Gene '64
Smith, Robert Kenneth '63
Stanfill, Ira Colon '61
TN B Myles, Jennifer Lee '94
TN Γ Clark, Tony Lee '89
Robertson, Franklin Lee '64
Ross, Anthony Dwayne '72
Walker, Robert Earl '71
TN Δ Hamby Jr., Sidney R. '74
TX A Johnson, Mark Edward '78
Mills, Denver L. '57
Reynolds, A-Lan V.H. '91
Sommer Jr., Walter F. '65
Thomas, Kurt Otto '79
Vaverek, Gavin Nicholas '81
Wilson, Arthur Eugene '65
TX B Dunn, Luci Ann '86
Hansen, Gracie Arlene '04
TX Γ South, Hugh Miles '71
TX Δ Bogner, Anthony John '87
Casco, Andres Enrique '99
Hall, Charles L. '72
Lock, Jack Allen '53
Pardue, Lon Hubert '63
Selensky, Fred Mitchell '71
TX E Klos, William Anton '63
TX H Farrow, Alan Lee '68
UT B Bracken, Allen T. '78
UT Γ Anderson, Matthew O. '93
VT A Moses, Almon Roderic '69
White, Janine L. '03
VA A De Francesco, Henry F. '47
Gritton, Charles William '76
Kennedy, Michael F. '72
Myers, Griffin Kyle '00
Wood II, Richard K. '83
VA B Arntson, Stephen G. '64
Gibson, Robert C. '61
Phillips, Neubert C. '57
Spangler, Edward Grant '79
WA Δ Miyata, George Kenneth '10
WV B Harper, Wendy Ann '00
Powell, Jennifer Lee '81
WI A Froh, David '74
Tubbs, Dennis Howard '86
Webster, James L. '72
WI B Kinnunen, Brandy Marie '18
Rupert, Jack R. '92
Schmit, Ralph E. '63
WY A Caudill, Lisa Ann '86
Rasmusson, William Lee '74

Alumni Giving continues on page 43.

RESULTS FROM WINTER

Perfect

*Couillard, J. Gregory	IL	A	'89
*Gerken, Gary M.	CA	H	'11
*Griggs Jr., James L.	OH	A	'56
*Slegel, Timothy J.	PA	A	'80
Spong, Robert N.	UT	A	'58
*Strong, Michael D.	PA	A	'84

Other

Barr, Robert A.	IL	E	'85
Barthel, Gerald R.	OH	B	'67
Bohdan, Timothy E.	IN	Γ	'85
Dechman, Don A.	TX	A	'57
*Gulian, Franklin J.	DE	A	'83
Gulian, Joseph D.	Son of member		
Handley, Vernon K.	GA	A	'86
Jordan, R. Jeffrey	OK	Γ	'00
Lalinsky, Mark A.	MI	Γ	'77
Mettler, Kelly M.	CA	Δ	'10
Riedesel, Jeremy M.	OH	B	'96
Schmidt, V. Hugo	WA	B	'51
Zison, Stanley W.	CA	Θ	'83

*Denotes correct bonus solution

THANK YOU HOWARD!

After more than 60 years of faithful service, our longtime Brain Ticklers' head judge, **Howard G. McIlvried III,** *PA Γ '53*, is calling it quits. His leadership and contributions will be missed by both readers and judges of this column. **Fred J. Tydeman,** *CA Δ '73*, will be assuming the role of head judge. **Gary M. Gerken,** *CA H '11*, a regular solver of Brain Ticklers with a strong record of solutions, has agreed to join the panel of judges. Gary will be writing the spring column going forward.

WINTER REVIEW

Tickler #2 (the logic problem involving couples with various vacation destinations) was the easiest problem for this issue, with all received submissions having the correct answer. Tickler #1 (the cryptarithm) proved both popular and straightforward, with all but one submission correct. The spherical geometry of Tickler #3 tripped up the most people, with ⅔ of submissions being correct. Equally difficult was the Bonus about the two spheres: the ⅔ correct submissions was tied for the lowest ratio, but nevertheless was higher than the columnist expected.

SPRING ANSWERS

1 The sum is **8991**, which can be achieved with a discard of 0 or 9. In the 9 discard case, the three primes are uniquely 23, 467, and 8501. We found 99 different sums generated from three addend primes with a single discarded digit. Of those 99 sums, only 8991 could be generated with two different discards. Six different addend sets could be created with a discarded 0, but only one set with the 9 discarded.

2 For 365 coins, no more than **7** weighings are required to determine if there is an eccentric penny, and the direction of the oddity.

It has been shown that the number of weighings needed for N coins is $\lceil \log_3(2N+3) \rceil$. The judges found several specific algorithms for a year's worth of pennies. A general solution for N coins is more challenging. Our generalized algorithm can be found at *www.tbp.org/pubs/brainTicklers.cfm*.

Note that the intent of the problem was to find the least upper bound on the number of weighings. A few readers pointed out that there are algorithms where the minimum number of weighings could be 2, although the maximum number of weighings may be much greater than 7. Given the ambiguous wording of the problem, the judges decided to accept both **2** and **7** as correct answers.

3 **$19683 = (1 + 9 + 6 + 8 + 3)^3$.** ABCDE must be a five digit number with unique digits, so $12345 \le ABCDE \le 98765$. The cube root sum is therefore ≥ 24 and ≤ 46. Note that the maximum sum of five digits is 35, further limiting the cube root to ≤ 35. Using trial and error, the 5 cubes that fit those constraints and have five unique digits are: $24^3 = 13824$, $27^3 = 19683$, $29^3 = 24389$, $32^3 = 32768$, $35^3 = 42875$. Only the second cube meets the sum constraint, so ABCDE = 19683.

4 The cards are distributed as follows:

1	4
2	44
3	52
4	720
5	1096
6	3744
7	16440

Three cards can be drawn in C(52,3) = 22,100 ways. A royal flush can be chosen in exactly **4** ways (one for each suit). A straight flush can be drawn in 4(12) = 48 ways (one for each suit times the number of denominations which can begin a straight), then subtracting the royal flushes, or 48 – 4 = **44** ways. The three-of-a-kind can be drawn in (13)C(4,3) = 52 ways (for each denomination, choose 3 of 4 cards). A straight can be drawn in $(12)4^3 = 768$ ways (for each denomination that can begin a straight, choose one card from each of three consecutive denominations), less the 48 straight flushes for 768 – 48 = **720**. A flush can occur in (4)C(13,3) = 1144 ways (for each suit, choose 3 of 13 cards), less the 48 straight flushes or 1144 – 48 = **1096**. Pairs can be drawn in (13)C(4,2)C(48,1) = **3744** ways (for each denomination, choose two of four cards, and then choose one of the remaining 48 cards). Subtract the first six counts from 22,100 to get **16,440**.

5 $2^{4,700,063,497} \equiv$ **3** (mod 4,700,063,497). Use the right-to-left binary method for modular exponentiation. The length of the exponent determines the complexity of the algorithm. The exponent 4,700,063,497 is a 33 bit value in length with 12 one bits. Therefore, there are 33 steps to the calculation, with 12 updates to the result. The calculations are possible (but tedious) by hand; the

judges found an extended precision calculator helpful. Curiously, the number 4,700,063,497 is known to be the smallest integer n greater than one such that $2^n \equiv 3 \pmod{n}$.

Bonus. The longest chain with less than 1,000 links is **989** with breaks between links 164 and 165, 594 and 595, 824 and 825. The distance between the posts of the equilateral triangle is 163,185. The shortest chain length that can be wrapped in multiple ways is **125** links, with breaks between links 2 and 3, 72 and 73, 102 and 103, or alternatively with breaks between 57 and 58, 92 and 93, 117 and 118. In this case, the distance between the posts of the triangle is 2,625.

Computer Bonus. $2016 + 2080 + 2145 = 79^2$. The sum of three consecutive triangular numbers is given by $(3n^2 + 9n + 8)/2$. Solve this equation for integral n, k: $2k^2 = 3n^2 + 9n + 8$. The first three solutions are $n = 5$, $k = 8$, $8^2 = 64 = 15 + 21 + 28$; $n = 14$, $k = 19$, $19^2 = 361 = 105 + 120 + 136$; and $n = 63$, $k = 79$, $79^2 = 6241 = 2016 + 2080 + 2145$.

NEW SUMMER PROBLEMS

1 $\cos(\arcsin(10.0))$ has what value?

—**Fred J. Tydeman**, *CA Δ '73*

2 Samantha's square courtyard (total area less than 100 m^2) has an area equal to an integral number of square meters. She decides to install an octagonal fish pond in the courtyard. To mark the sides of the pond, she draws lines from each corner of the square to the midpoints of the two sides not touching said corner. She finds that the perimeter of the pond, thus delimited, is an integral number of meters. What is the area of the courtyard, and what is the perimeter of the pond?

—An Enigma by Andrew Gibbons in *New Scientist*

3 A student rides their bicycle across the mud, leaving tracks as in the diagram. One of the colored tracks represents the path of the rear tire, the other the front tire. Is the direction the student traveling from left to right, or right to left? Does the red or green color represent the rear-tire track?

—adapted from *The Adventure of the Priory School* by Arthur Conan Doyle

4 What is the exact probability that the first decimal digit of 2^N is a 1, as N becomes large?

—*Challenging Mathematical Problems with Elementary Solutions* by A.M. & I.M. Yaglom

5 As part of a Mission Impossible team, you have a vital switch to throw in exactly 31 minutes. Unfortunately, your watch has just stopped. All you have are two lengths of fuses, which burn irregularly, and a supply of matches. One fuse takes 50 minutes to burn completely when lit from either end, and the other which burns in 24 minutes. How do you use these two fuses to time exactly 31 minutes? (A fuse can not be folded to make a shorter time, but it can be burned from both ends to get half the time.)

—**Richard I. Hess,** *CA B '62*

Bonus. Divide a rectangular sheet of paper into 8 identical squares. On the front side of the paper, number the 8 squares as shown:

1	8	7	4
2	3	6	5

On the back of square N write the Nth letter of the alphabet.

Fold the sheet along the lines (like a paper road map) to form a square packet such that the "1" square is face up on top. Describe the folding sequence (that is, what folds onto what) needed such that the squares are in serial order 1 through 8 from top to bottom. Other than the top square, the squares need not be number side up.

Repeat the task, this time with the front side squares numbered as below:

1	8	2	7
4	5	3	6

—*My Best Mathematical and Logic Puzzles* by Martin Gardner

Double Bonus. A circular 30 cm diameter pizza is cut into 8 identical slices. The slices are arranged on a flat circular plate that is marginally smaller in diameter than the original 30 cm, such that the slices do not overlap each other nor do they overlap the edge of the plate. What is the maximum number of slices S that can fit on the smaller plate? What is the diameter D_S of the smallest plate that can hold S slices? What is the diameter D_{S-1} of the smallest plate that can hold S-1 slices?

— **Timothy J. Slegel,** *PA A '80*

Send your answers to any or all of the Summer Brain Ticklers to *BrainTicklers@tbp.org* as plain text only or by postal mail to **Dylan Lane, Tau Beta Pi, P.O. Box 2697, Knoxville, TN 37901-2697**. The method of solution is not necessary, and the Computer Bonus/Double Bonus is not graded. Where possible, exact answers are preferable to approximations. The cutoff date for entries to the Summer column is the appearance of the Fall *Bent* in mid-September (the digital version is distributed a few days earlier). We welcome any interesting problems that might be suitable for the column. Dylan will forward your entries to the judges who are **F.J. Tydeman,** *CA Δ '73;* **J.R. Stribling,** *CA A '92;* **G.M. Gerken,** *CA H '11;* and the columnist for this issue,

— **J.C. Rasbold,** *OH A '83*

Texas Xi Installed

Photo credit to Edward M. Penton, P.E., TX H '06, Texas Eta Chapter Advisor.

TEXAS XI was installed as a Tau Beta Pi Chapter at the University of Texas at Dallas on February 15, 2020. Councillor Menna M. Youssef, Ph.D., *VA Γ '04*, was the official installing deputy of the Society's 255th (249th active) collegiate chapter, assisted by Executive Director Curtis D. Gomulinski, *MI E '01*, and District 10 Directors Madison R. Herman, *OH Z '13*, and Gary L. "Dusty" O'Day Jr., *TX E '16*.

The 2019 Convention granted a chapter to Tau Beta Xi, represented in Columbus, OH, by Michael A. Saul, president, and Todd W. Polk, Ph.D., *TX Δ '84*, chief advisor.

The Founders North Building on the campus was the site of the formal ceremonies of initiation and chapter installation, witnessed by TBP alumni Diana L. Cogan, *TX Δ '82*; Kevin C. Cogan, *TX Δ '81*; Robert A. Diggs, *OK Γ '74*; Bhavna K. Guidry, *FL Γ '06*; Caroline Kabus, *KS Γ '17*; David J. Keating, *TX H '92*; Ethan J. Leas, *TX N '16*; Michelle A. Mulkey, *TX H '88*; Edward M. Penton, P.E., *TX H '06*; Timothy S. Ray, *OH K '81*; David W. Richardson, *TX H '92*; Moyez Thanawalla, *TX I '84*; Lucas G. Verschelden, *KS Γ '17*; James C. Williams, Ph.D., P.E., *NM B '76*; and Patrick M. Winter, *TX H '97*.

The initiation team included: Robert J. Beem, *OK A '19*; Jonathan Escalante, *TX H '20*; James M. Florence, Ph.D., *TX H '72*; Robert A. Hart, Ph.D., P.E., *TX E '93*; Zachary L. Holloway, *TX H '20*; Mercedes J. Johnson, *TX K '21*; Jonathan M. Marek, *TX H '21*; Todd W. Polk; Maxwell P. Sanders, *TX H '19*; Michael A. Saul, *TX Ξ '20*; and Sophie E. Soueid, *TX H '20*; and the four Association Officials listed above. The charter members comprise twenty-four undergraduates, sixteen alumni, and one eminent engineer (identified on the facing page).

Following the formal initiation, the new members were constituted a new chapter in the ceremony of installation conducted by Councillor Youssef. The ceremony included the formal election and installation of the chapter's charter officers and advisors.

After the installation ceremony, attendees proceeded to the Faculty Dining Room in the Student Union for a formal banquet. Councillor Youssef, Executive Director Gomulinski, and District 10 Directors Herman and O'Day welcomed the members of the newest chapter on behalf of the Association and District and encouraged them to remain active while students and to engage in a local alumni chapter after graduation. Texas Xi President Saul and Chief Advisor Polk recapped the history that brought Tau Beta Pi to UT Dallas and congratulated the new members for their diligent work.

At the conclusion of the banquet, Councillor Youssef and the other Association Officials led the attendees in a stirring rendition of the Tau Beta Pi Cheer.

Charter Presentation
Curtis D. Gomulinski, Todd W. Polk, Michael A. Saul, Menna M. Youssef, James M. Florence, and Robert A. Hart (left to right).

Images courtesy of Kim Horner, UT Dallas Communications Manager.

Initiation Team

Initiates (Alumni & Eminent Engineer)

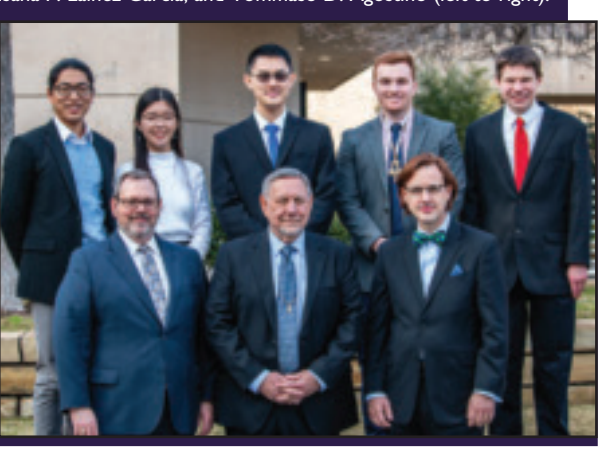
Back row: Benjamin J. Gravell, Nathan J. Gardner, Akshay Chitale, Ximone Willis, Katherine E. Schliesing, and Isabelle A. Smith (left to right). Front row: Jamie D. Gravell, Pavel Bolshakov, Bilal Quadri, Danyal Ahsanullah, Poras T. Balsara, Tyler J. Brune, Daniel I. Barnes, and Calvin R.J. Stence (left to right).

Initiates (Students)

Back row: Dylan Kreth, Jay J. An, Kristen M.T. Nguyen, Wesley Pan, Eric J. Sanders, Jacob B. Scanlan, Bryan Ray, Yao Tao C. Cai, Dawson T. Booth, and Daanish H. Khazi-Syed (left to right). Front row: Varsha Thomas, Michael G. Hippleheuser Elizabeth A. Beisert, Christopher H.M. Nguyen, Michael Saul, Aaron Y. Pan, Darrah A. Merillat, Wesley Brigner, Amy Abraham, Susana P. Lainez Garcia, and Tommaso D. Agostino (left to right).

Initiation Team

Back row: Curtis D. Gomulinski, Maxwell P. Sanders, Mercedes J. Johnson, Michael A. Saul, Sophie E. Soueid, Zachary L. Holloway, Jonathan Escalante, and Jonathan M. Marek (left to right).
Front row: Dusty L. O'Day Jr., Madison R. Herman, Todd W. Polk, Menna M. Youssef, James M. Florence, Robert A. Hart, and Robert J. Beem (left to right).



First Officers

Back row: Jay J. An, Kristen M.T. Nguyen, Wesley Pan, Michael A. Saul, and Jacob B. Scanlan (left to right).
Front row: Todd W. Polk, James M. Florence, and Robert A. Hart (left to right).

The University of Texas at Dallas

The 249th active Chapter of Tau Beta Pi, Texas Xi, installed on February 15, 2020, in Dallas, Texas.

UTD

The University of Texas at Dallas is a rapidly growing research institution that attracts students with diverse backgrounds from across the United States and the globe. From 2007-17, it was the second fastest growing public doctoral university in the country according to *The Chronicle of Higher Education*. In 2019, the university was named the number one best value public university in Texas, according to *Forbes*, particularly for its academic quality, affordability, timely graduations, and alumni earnings.

Founded in 1969, the university has expanded to provide a broad array of over 140 academic programs serving nearly 30,000 students and has established high performing programs in the Erik Jonsson School of Engineering and Computer Science as well as other schools. Within just 50 years, the university has evolved into one of the top research institutions in Texas. Its faculty includes more than 570 tenured and tenure-track members hailing from the world's best institutions and includes members of the National Academy of Sciences and the National Academy of Engineering.

In addition to its recent investment in top facilities, UT Dallas is home to art collections and more than 50 centers, labs, and institutes that facilitate research, internships, and collaborations with local corporations and nonprofit organizations.

In 2018, the university qualified for funding from National Research University Fund, an exclusive source of research support available to the state's emerging research universities. UT Dallas qualified for this funding by achieving these Texas Higher Education Coordinating Board's benchmarks for two consecutive years: $45 million in annual expenditures on restricted research, a $400 million endowment, a high-achieving freshman class, high-quality faculty, and membership in the Association of Research Libraries, Phi Beta Kappa, or equivalent national organization. Along with classification as a Carnegie R1 research institution in 2015, this recognition represents a significant milestone for the university.

The Jonsson School, at just over 30 years old, is a significant driver of the university's accomplishments. In the last dozen years, the Jonsson School has doubled in size with the creation of four new departments and nine new degree programs, while maintaining students with the highest achievements as evidenced by top scores on standardized tests to consistent recipients of prestigious honors such as participation in the Barry M. Goldwater Scholarship and Excellence in Education Program and the National Science Foundation Graduate Research Fellowships Program. In addition, many students are recruited from throughout the world to join the university's chess team, which has made 17 appearances in the 20 years of the President's Cup that is informally known as the Final Four of College Chess.

Connecting Innovation to Industry

Founded originally as a research arm of semiconductor giant Texas Instruments Inc. (TI) and strategically located within the Telecommunications Corridor of the Dallas-Forth Metroplex, which is home to hundreds of high-tech companies, the university has a unique connection to industry.

TI founders Eugene McDermott, J. Erik Jonsson, *IN B 1922*, and Cecil Green wanted to stop losing top talent in the North Texas region to coastal cities, and Dallas' institutions at that time lacked the capacity to train professionals in STEM fields at the graduate and post-graduate level. In order to attract and develop professionals in high technology and scientific fields, they established the Graduate Research Center of the Southwest in 1961, which later became the Southwest Center for Advanced Studies and eventually part of the University of Texas System as UT Dallas.

UT Dallas remains uniquely connected to industry and is an economic driver in the North Texas region which attracts international students across the globe.

Supporting the Brightest Students

UT Dallas is among the Top 10 universities in the nation for most National Merit Scholars. Located in the Hobson Wildenthal Honors College, the UTD National Merit Scholars Program combines a specially designed set of intellectual and cultural opportunities with generous financial support and works closely with each of the eight UT Dallas schools to promote academic achievement and celebrate scholarly success. Additionally, the university encourages high performance across socioeconomic groups. In 2018, more than 45 percent of bachelor's degrees were awarded to economically disadvantaged students.

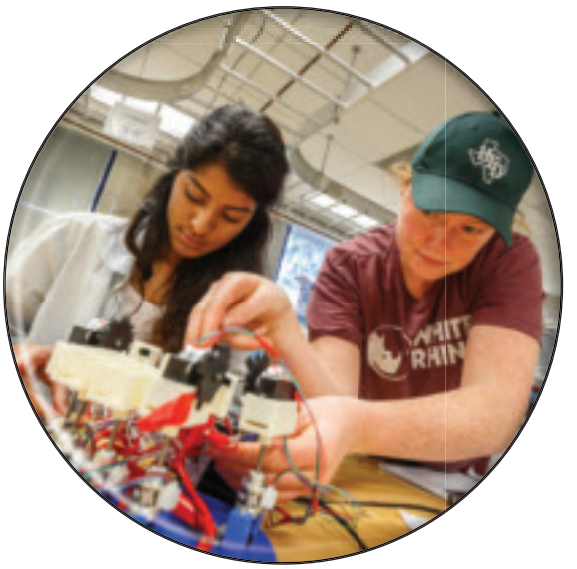
UT Dallas strongly encourages students at all levels to participate in research and offers a wealth of opportunities for undergraduates in many disciplines. The Jonsson School features top quality facilities including a state-of-the-art cleanroom at the Natural Science and Engineering Research Laboratory, the bioengineering and sciences building completed in 2016, which houses the school's Department of Bioengineering, and Engineering and Computer Science West, home of the school's Department of Mechanical Engineering completed in 2018. Additionally, the Boundary Layer and Subsonic Tunnel (BLAST) provides space for wind engineering research and the school has one of the largest makerspace/design studios in the country.

By pairing exceptional faculty with promising students, UT Dallas provides hands-on experiences with the scientific process. Undergraduates learn how to solve unique problems and face intellectual challenges while developing skills in a supervised university research environment.

Committed to Best Practices

The Jonsson School is the third ranked public school in Texas according to *U.S. News and World Report*, following only the UT at Austin and Texas A&M University. Its newer programs are in the Departments of Materials Science and Engineering, Mechanical Engineering, Bioengineering, and Systems Engineering. Its founding programs — in the Departments of Computer Science and Electrical and Computer Engineering — are among the largest producers of graduates in the country. Recent areas of expansion include biomedical engineering, mechanical engineering, materials science, analog electronics, cybersecurity, systems engineering, robotics, and control systems.

Dean Stephanie G. Adams, Ph.D., *NE A '89*, joined the Jonsson School in August 2019 and has set her sights on extending the school's impressive growth trajectory. As President of the American Society for Engineering Education (ASEE) from 2019-20, Dr. Adams has aimed to improve access, equity, diversity and inclusion on a national scale while advocating for best practices in engineering education. As a pioneering researcher of teaming in the engineering classroom, she will focus on improving the student experience as the school continues to expand and build out programs.



"We need students to be working in teams, being more involved and engaged in their learning. We should constantly be reminded of the fact that we are not locked into whatever our existing pedagogy is," Adams said via *Prism Magazine*, the flagship publication of ASEE, in September 2019. "We don't have to teach the way we were taught, just because it's always been done that way."

Every engineering and computer science senior at UT Dallas is required to complete a team-oriented, capstone design project. This final project allows students to engage in the design process, utilize their project-management skills, and solve an open-ended problem while working with peers. The course gives students hands-on design experience as well as development of soft skills that prepare them for the world of work.

UTDesign® projects are proposed, sponsored, and mentored by companies. Students work on a real-world problem in an environment similar to that of industry professionals. Each team typically consists of four to six senior students and is coached by two people: a corporate mentor, who acts as the technical point of contact for the company, and a UT Dallas advisor. Over the past six years, UTDesign teams have won five national awards at the American Society of Mechanical Engineers (ASME) Manufacturing Science and Engineering Conference and three national awards at the biennial Capstone Design Conference.

Additionally, undergraduate students have the opportunity to participate in UTDesign EPICS, a service learning design program where multidisciplinary teams solve real problems for nonprofit organizations while leaving a lasting impact on the community. Modeled after the EPICS program founded in 1995 at Purdue University, UTDesign EPICS has joined the university consortium of more than 25 universities and colleges engaging students in human-centered design in a service learning framework.

Within its 50 years, The University of Texas at Dallas has made significant strides toward becoming a top tier research institution and destination for high quality engineering programs in the Southwest.

Special thanks to Todd W. Polk, Ph.D., TX D '84, for the article and images. Dr. Polk is a Sr. Lecturer II at UT Dallas and Chief Advisor to the Texas Xi Chapter.

PEOPLE

Emily J. Arnold, Ph.D., *Kansas Alpha '09*,

received an NSF CAREER grant to incorporate radar and antenna into a UAS helicopter to measure bed topography and crevasse size of two ice sheets in Greenland. She is an assistant professor of aerospace engineering at the University of Kansas (KU), a ΤΒΠ Scholar (2008), and a B.S. and Ph.D. alumna of KU.

Lance R. Collins, Ph.D., *New York Delta '81*,

has been hired as the inaugural vice president and executive director of Virginia Tech's new Innovation Campus in Alexandria, which has ties to Amazon. He previously served as dean of engineering at Cornell University. He received his B.S. from Princeton University in chemical engineering and joined ΤΒΠ in 2011 as an eminent engineer.

John L. Crassidis, Ph.D., *New York Nu '89*,

has been named Distinguished Professor by the SUNY Board of Trustees, the highest rank in the SUNY system. He is a professor in the department of mechanical & aerospace engineering, with expertise in space situational awareness and space station safety, and research on improving the detection and tracking of man-made objects orbiting Earth.

M. Cynthia Hipwell, Ph.D., *Texas Gamma '91*,

has been recognized with the 2019 Eminent Scholar Award given jointly by Texas A&M University and the A&M Office of the President. She is a professor of mechanical engineering and a Texas A&M Engineering Experiment Eminent Professor. Her research interests include nanoscale energy transport and tribology of small-scale devices.

SPOTLIGHT

Improved Gene-Editing in Human Stem Cells

Using a new update to the CRISPR base editing technology at Arizona State University's Brafman Lab, results were recently published in the journal *Stem Cell Reports* of highly accurate, single-DNA base editing with an efficiency of up to 90 percent of human stem cells. Assistant professor **David A. Brafman, Ph.D.,** *CA A '05*, is principle investigator at the lab that developed a new TREE (Transient Reporter for Editing Enrichment) method, which allows for bulk enrichment of DNA base-edited cell populations — and for the first time, high efficiency in human stem cell lines.

"We envision this method will have important implications for the use of human stem cell lines in developmental biology, disease modeling, drug screening and tissue engineering applications," said Dr. Brafman.

The lab's current research targeted Alzheimer's for gene editing and regeneration.

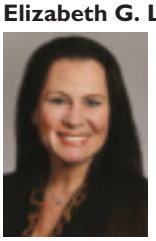
Civil Engineering Department at CCNY Honored

The American Society of Civil Engineers Metropolitan Section awarded the Grove School of Engineering's civil engineering department at The City College of New York (CCNY) with a Centennial Award for "significant contributions to the civil engineering profession" and its work to help build the city over the past century. The award coincides with the the school's centennial. The Grove School is the only public school of engineering in the New York City metropolitan area, was founded in 1919, and renamed in 2005 in honor of alumnus **Andrew S. Grove, Ph.D.,** *NY H '60*, whose $26 million gift to the institution is the largest in CCNY's history. Grove, a founder and chairman of Intel Corp., passed away in 2016.

Raymond J. Krizek, Ph.D., *Maryland Alpha'54*,

received the 2020 Outstanding Projects and Leaders Award from the American Society of Civil Engineers for demonstrated excellence in furthering civil engineering education. He is a professor of engineering, Master of Project Management program director, and Master of Executive Management for Design & Construction at Northwestern University.

Elizabeth G. Loboa, Ph.D., *California Lambda '95*,



has joined Southern Methodist University as provost and vice president of academic affairs. She was vice chancellor for strategic partnerships and dean of the College of Engineering at the University of Missouri. A biomedical engineer, her B.S. degree is in mechanical engineering from the University of California, Davis.

FACILITIES

California State University, Fullerton, has received a $10 million donation from Nicholas Begovich, a retired engineering executive. The gift will go to CSUF's Center for Gravitational-Wave Physics and Astronomy Center to be named after him and his wife, Lee. The center's research focuses on gravitational waves, ripples in the fabric of space-time produced by the massive collision of two black holes.

Howard University announced a $10 million gift from the Karsh Family Foundation to endow the Bison STEM Scholars Program, which will be renamed the Karsh STEM Scholars Program and is designed to increase the number of underrepresented minorities earning a Ph.D. in a STEM discipline.

Iowa State University received a half-million dollars from the National Science Foundation to create a graduate program catered for STEM students. The goal of the program is to both improve professional skills for graduate students, and also improve graduate student job readiness and placement prior to graduation. ISU's department chair of industrial and manufacturing engineering, Gul Okudan Kremer, Ph.D., *IA A '92*, said: "The impact of graduate education in STEM disciplines, and in this particular area on engineering, is so fundamental that we do graduate education right, because it is a direct impact on the sustainment of innovation in engineering — not only for research enterprise, but for our impact on the industry."

S. David Wu, Ph.D., *Pennsylvania Alpha'81*,

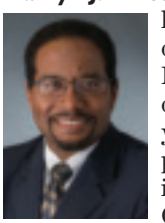
has been appointed president of Baruch College of The City University of New York. Previously, he was provost and executive vice president of George Mason University (VA) and spent over a decade as dean of the College of Engineering at Lehigh University. He received his M.S. and Ph.D. degrees from the Pennsylvania State University.

Chih-Kong Ken Yang, Ph.D., *California Gamma '92*,

has been appointed chair of the electrical and computer engineering department at UCLA. He co-founded Pluribus Networks, Inc., and is a professor focused on research of mixed analog-and-digital circuit design and its impact on computing systems. All three of his degrees were earned at Stanford University in electrical engineering.

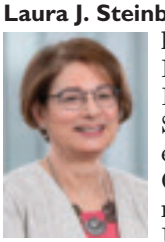
PEOPLE

Darryll J. Pines, Ph.D., *Maryland Beta '86*,



has been appointed president of the University of Maryland. Previously dean of the school of engineering, he has spent 25 years on the College Park Campus in the aerospace engineering department, testified before Congress on STEM education, and created the Top 25 Source Schools program for Maryland high schools.

Laura J. Steinberg, Ph.D., *Pennsylvania Delta '80*,

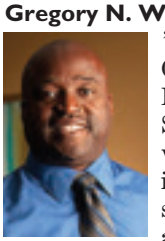


has been named as the inaugural Executive Director of the Schiller Institute for Integrated Science and Society. Previously, she was interim executive director of the Syracuse Center of Excellence for Environmental Energy Systems at Syracuse University and founding director of the university's Infrastructure Institute. Her B.S. degree is in civil & urban engineering from UPenn.

Elaina J. Sutley, Ph.D., *Alabama Beta '10*,

received an NSF CAREER grant to examine the role different types of buildings play in helping a community withstand disaster and an early career research fellowship from the National Academies of Science, Engineering, and Medicine through their Gulf Research Program. She is an assistant professor of civil, environmental & architectural engineering at the University of Kansas.

Gregory N. Washington, Ph.D., *Ohio Gamma '89*,



has been selected president of George Mason University (VA). Previously, he was dean of the School of Engineering at the University of California, Irvine. He is an accomplished researcher specializing in dynamic systems, author of more than 150 technical publications, and with three degrees in mechanical engineering from North Carolina State University.

Arkansas Beta Installed

ARKANSAS BETA was installed as a Tau Beta Pi Chapter at the University of Arkansas at Little Rock (UALR) on March 7, 2020. President C. Craig Smith, P.E., *TN E '80*, was the official installing deputy of the Society's 256th (250th active) collegiate chapter, assisted by Executive Director Curtis D. Gomulinski *MI E '01*, and Director of Alumni Affairs Tricia E. Gomulinski, *SD A '98*.

A chapter was granted by the 2019 Convention to Tau Beta Beta, represented in Columbus, OH, by Abbas Al Wahhamy, president, and Yupo Chan, Ph.D., P.E., *MA B* '67, chief advisor.

The Association Officials began the day by leading an orientation and education session for the new chapter officers: Tau Beta Beta President Mohammad Arani; Vice President and Secretary Nigel Q. Kelly; and Advisors Chia-Chu Chiang, Ph.D., *AZ B '94;* Anne K. Turner, P.E., *IN A '05;* and Andrew B. Wright, Ph.D., *SC B '86*. The officers received an overview of Tau Beta Pi, responsibilities of officers and advisors, chapter finances, and recommendations for chapter operations.

The Engineering and Information Technology Building on campus was the site of the formal initiation and chapter installation ceremonies.

The initiation team included: Chia-Chu Chiang, Meagan Olsen, *AR A '21*; Joseph P. Simpson, *AR A '13*; Anne K. Turner; and Andrew B. Wright; and the three Association Officials previously mentioned. The charter members include eight undergraduates, four alumni, and two eminent engineers (identified on the facing page).

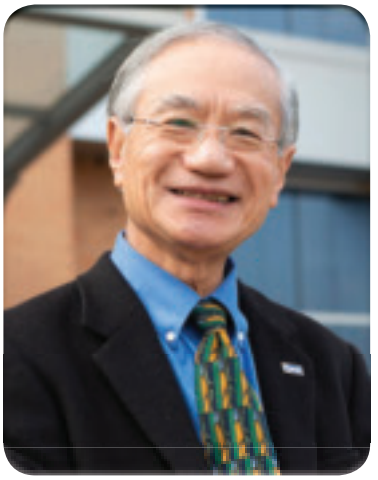
Following the formal initiation, the new members were constituted a new chapter in the ceremony of installation conducted by President Smith. The ceremony included the formal election and installation of the chapter's charter officers and advisors.

During the installation ceremony, President Smith paid tribute to Yupo Chan, founding advisor of the Tau Beta Beta local honor society. Dr. Chan had spearheaded the formation of the local honor society and worked tirelessly for nearly a decade towards petitioning for a chapter of Tau Beta Pi at UALR. He was able to participate in the petitioning process at the 2019 Convention and was on hand when a chapter was granted to Tau Beta Beta. Sadly, Dr. Chan passed away after a short battle with cancer on February 5, without witnessing his years-long efforts coming to fruition.

Following the ceremony, President Smith and Executive Director Gomulinski congratulated the newest members of Tau Beta Pi on their charter membership in the Arkansas Beta Chapter. Lawrence E. Whitman, Ph.D., *AR B '84*, Dean of the George W. Donaghey College of Engineering and Information Technology at UALR expressed his appreciation for being among the charter members of the new chapter and encouraged the new members to carry on in the spirit of the work begun by Dr. Chan.

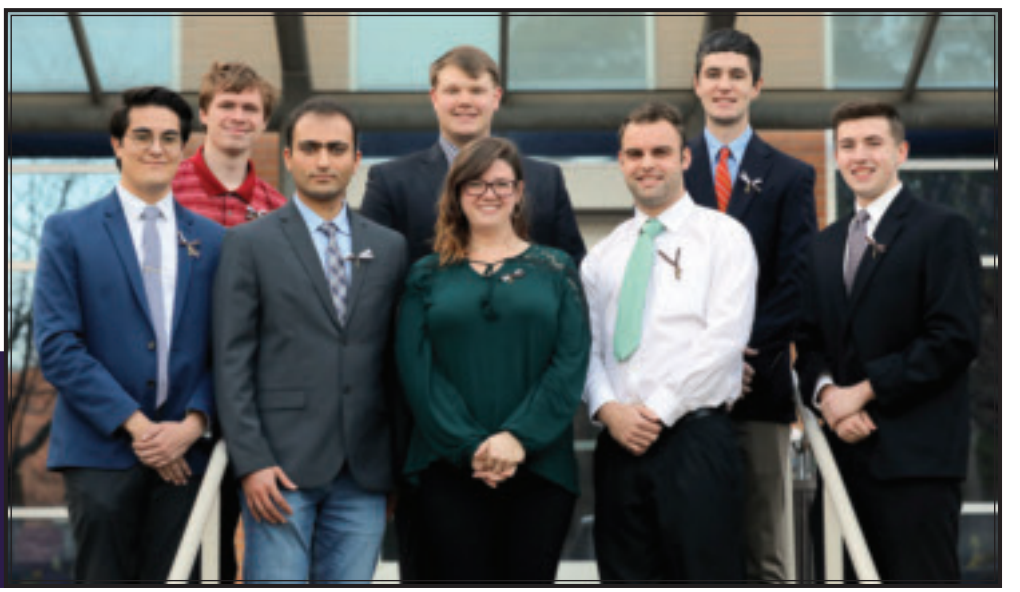
The day's events concluded at YaYas Euro Bistro for an evening of good food and celebrating the newest chapter of Tau Beta Pi.

Charter Presentation
Andrew B. Wright, Nigel Q. Kelly, Mohammad Arani, C. Craig Smith, Curtis D. Gomulinski, and Lawrence E. Whitman (left to right).



Yupo Chan, Ph.D., P.E., *MA B '67*, (1945-2020)
UARL Professor & AR Beta Chief Advisor
Photo Credit: Brian Chilson, *Arkansas Times*

Initiates (Alumni & Eminent Engineers)
Dean Lawrence E. Whitman, Pynshailang Nongsiej, Andrew Cherry, Hugh Benfer, Egide Murisa, and Hollis G. Bray (left to right).



Images courtesy of Stephen B. Thornton, Multi-media storyteller at Arkansas Dept. of Human Services.

Initiates (Students)
Back row: Eric N. Sutherland Jr., Caleb E. Renfroe, and John T. Schwarz (left to right).
Front row: Joseph A. Sepulveda, Mohammad Arani, Nikki K. Mullen, Nigel Q. Kelly, and Caleb L. Head (left to right).

Initiation Team
Back row: Curtis D. Gomulinski, Joseph P. Simpson, C. Craig Smith, and Andrew B. Wright (left to right). Front row: Meagan Olsen, Chia-Chu Chiang, Anne K. Turner, and Tricia E.. Gomulinski (left to right).

First Officers
Back row: Mohammad Arani, Chia-Chu Chiang, and Andrew B. Wright (left to right). Front Row: Anne K. Turner, and Nigel Q. Kelly (left to right).

The University of Arkansas at Little Rock

The 250th active Chapter of Tau Beta Pi, Arkansas Beta, installed on March 7, 2020, in Little Rock, Arkansas.

The University of Arkansas at Little Rock is a public research university in Little Rock, Arkansas. Established as Little Rock Junior College by the Little Rock School District in 1927, the institution became a private four-year university under the name Little Rock University in 1957. It returned to public status in 1969 when it merged with the University of Arkansas System under its present name.

Located on 250 acres, the UA Little Rock campus encompasses more than 56 buildings, including the Center for Nanotechnology Integrative Sciences, the Emerging Analytics Center, the Sequoyah Research Center, the Institute for Chief Data Officers, and the Ottenheimer Library. Additionally, UA Little Rock houses special learning facilities that include a learning resource center, art galleries, KUAR public radio station, and University Television.

The university features more than 100 undergraduate degrees and 60 graduate degrees, including graduate certificates, master's degrees, and doctorates, through both traditional and online courses. Students attend classes in one of the university's three colleges and a law school. With over 15,000 graduates in the last ten years and over half of those graduates in STEM and High Demand fields, UA Little Rock is integral to the regional economy.

The Donaghey College of Science, Technology, Engineering, and Mathematics (STEM) is a key partner with industry, research, and education in the capital region of Little Rock, Arkansas. STEM is a vital part of the eco-system of the region and is an active partner with its many constituents within the state and the region. Prior to the establishment of the college in 1999, Little Rock was the largest city in the country without an engineering college. As engineering and information technology are vital to the central Arkansas economy and must be sustained for the growth of the area, local industry and government leaders envisioned an engineering college in Little Rock, and the Donaghey College was established. The college offers a diverse array of outstanding programs at the associates, bachelors, masters, and doctoral levels, including undergraduate degrees in civil and construction engineering, electrical and computer engineering, mechanical engineering, and computer science, which has been rated as one of the top 50 most innovative programs in the nation.

Photos provided by the University of Arkansas at Little Rock Office of Communications and Marketing.

The faculty are hard at work mentoring students and developing cutting edge academic programs, some of which are offered via a hybrid mode of delivery — classroom teaching as well as webcasting and performing cutting edge research in areas such as 3D printing, robotics, drones, cyber security, social computing, data quality, big data, virtual reality, earth sciences, materials, and nanotechnology. Teaching is a college priority, and Dr. Jin Lee, an associate professor of mechanical engineering, received the university's faculty award for excellence in teaching in spring 2019.

All engineering programs require a year-long, team-based capstone project, many in conjunction with local companies, which culminate in a sophisticated engineering design. These projects require the students to present preliminary, critical, and final design reviews to the program faculty and to manage budgets and fabrication schedules. Recent projects include a sail-based wind-power generator, a thrust stand for a proprietary drone, and a temporary, portable housing module, which won the 2015 National ABC competition. The civil and construction engineering students won the 2015 NCEES Engineering Award for Connecting Professional Practice Education for their capstone project. Three systems engineering students who designed a water pump to provide clean drinking water to a rural village in Haiti attended the Clinton Global Initiative University at Northeastern University in Boston to discuss their work.

The college's graduates have gone on to highly successful careers in business, industry, government, and academia.

Through hands-on summer programs, the college's faculty mentor college aspirants in the disciplines of engineering and information technology. The college sponsors a BEST hub, where teams of high school students participate in a nationally organized robotics competition.

In July 2020, the college welcomes the Biology, Chemistry, Mathematics and Statistics, and Physics and Astronomy Departments to form the new Donaghey College of Science, Technology, Engineering, and Mathematics. The future of the new college will prepare quality graduates for years to come.

ΤΒΠ Ratification Ballot Results — 2019

The 2019 Convention approved four amendments to the Constitution of Tau Beta Pi and sent it to the chapters for ratification.

In accord with the Association's amending procedure, with 295 chapters (250 collegiate and 45 alumni) eligible to vote, 222 or more affirmative chapter votes are required to ratify an amendment, and 74 or more negative votes would defeat it.

Headquarters received 119 valid ballots by the voting deadline of April 1, 2020 (plus 24 invalid for lack of a chapter quorum). An additional 25 valid ballots (plus 3 invalid) were received after the deadline prior to the Executive Council meeting.

The **Council acted on May 18 and voted in favor of all four amendments** on behalf of those chapters submitting an invalid ballot or no ballot. The **ratified amendments are effective now**.

AMENDMENT	OUTCOME
1. Update the Association's seal. (Const. Art. XIV, Sec. 2(f))	Unresolved by chapter vote; 137 affirmative, 7 negative.
2. Adjust the Trustee requirements to allow management by a registered investment advisor. (Const. Art. XIII, Sec. 7(a))	Unresolved by chapter vote; 125 affirmative, 19 negative.
3. Update allowable trust investments to include Exchange Traded Funds and Real Estate Investment Trusts. (Const. Art. XIII, Sec. 8)	Unresolved by chapter vote; 115 affirmative, 29 negative.
4. Allow the Convention to select a future Convention site more than three years in advance. (Const. Art. IX, Sec. 7(d))	Unresolved by chapter vote; 121 affirmative, 23 negative.

NEW SEAL

OLD SEAL

The condensed style of these notices of death is made necessary by the Association's large membership and space limitations in The Bent. *You may email or write the Editor for additional facts (if available) concerning the following deceased members. The assistance of all is earnestly sought in reporting the deaths of Tau Bates, with appropriate details, including date of death and full name by sending an email to chapter.eternal@tbp.org.*

AL A '55 **Hartley Jr., John Thomas;** June 5, 2018.
'74 **Robinson Jr., Lewis Edward;** February 9, 2020.
'90 **Norton, Bill Wayne;** September 2, 2018.
AL B '48 **McElmurry, Thomas Uriel;** November 3, 2006.
'48 **Windham Jr., Walker Lee;** no details.
'57 **Moore, Thomas Seldon;** no details.
'60 **Welch, Jack Lenton;** no details.
'63 **Vickers, William T.;** March 12, 2020.
AL Γ '39 **Hamner, George Fleming;** October 17, 2016.
AZ A '67 **Hicks, John Palmer;** March 16, 2019.
AR A '55 **Ballard, George Spear;** September 5, 2019.
'57 **Crump, James Shaw;** no details.
'59 **Sherman Jr., John King;** October 6, 2002.
CA A '62 **Curley, Robert Morse;** December 10, 2006.
'65 **Cooper, Thomas Edward;** March 26, 2020.
'65 **Skarheim, Hans Petter;** January 1, 1996.
CA B '42 **Hall, Robert Noel;** no details.
CA Γ '53 **Holton, David Stanley;** no details.
CA Δ '40 **Foy, Glenn Arthur;** January 3, 2018. *[Cent.]*
'50 **Farwell, Robert Harvey;** October 14, 2019.
'74 **Logsdon, Carroll;** March 23, 2020.
CA E '43 **Whiteman, Irvin R.;** September 6, 2019.
'53 **Rasmussen, George Stanmore;** no details.
'60 **Bergsteinsson, Linda;** August 27, 2002.
'64 **Matsuoka, Takuo;** February 7, 2012.
'65 **Triepke, Darryl Alton;** January 25, 2016.
CA Z '66 **Deis Sr., John James;** February 29, 2020.
'09 **Sennott, Timothy Burke;** January 21, 2020.

IN MEMORY

Timothy Sennott, *California Zeta '09*, passed away at the age of 34. He co-founded Noble Thermodynamic Systems, Inc., a company that developed the argon power cycle, an engine design that delivers emission-free electricity from natural gas. He earned mechanical engineering degrees – B.S. from Santa Clara University, and M.S. from UC Berkeley.

CA H '65 **Lee, Robert Morris;** September 13, 2012.
CA Θ '63 **Powers, Glen Allan;** May 6, 2016.
CA K '76 **Correll, Robert Wesley;** April 27, 2004.
CA M '84 **Morrison, John Arthur;** June 11, 2015.
CA N '62 **O'Neil, John Denis;** February 12, 2020.
CA P '40 **Haynes, Charles Willard;** May 1, 2015.
'87 **Whelchel, Mark Alan;** April 8, 2019.
CO B '40 **Burt, Lawrence Strite;** July 4, 2019.
'47 **Clark, David Elmer;** March 22, 2016.
'49 **Burk, Marion Keith;** February 20, 2009.
'52 **Gittinger, Norman Clark;** March 28, 2020.
'57 **Case, William Ervin;** no details.
'57 **Dennis, Forest George;** October 5, 2019.
'65 **Iversen, Oyvind Helge;** July 28, 2019.
CO Γ '59 **Friedman, Paul Arnold;** no details.
CO Δ '15 **Nickless, Kyle Clark;** February 16, 2020.
CT A '49 **Romberg, Robert Edgar;** March 30, 2019.
'50 **Huddleston III, William Henry;** June 6, 2015.
'51 **Long Jr., Thomas F.;** April 8, 2020.
'51 **Richter, George Neal;** no details.
CT B '40 **Butler, Howard W.;** no details.
'52 **Zawodniak, Clement Donald;** February 25, 2019.
DE A '51 **Skinner, Albert Mark;** February 11, 2020.
'56 **Russell, T. W. Fraser;** November 29, 2019.
DC A '51 **Conliffe, Calvin Hughes;** April 27, 2003.
DC B '61 **Augusti, Fred Anthony;** October 2, 2016.
DC Γ '85 **Tzou, David Tzeku;** December 3, 2017.
FL B '40 **Mantell, Murray Irwin;** February 9, 2020.
GA A '43 **Elliott, Marvel Artis;** January 3, 2019.
'45 **Barnes, Edwin Ladson;** May 20, 2018.
'45 **Hippler, Jack Bradley;** no details.
'48 **Batts, Jiles Larry;** February 26, 2019.
'48 **Hemmingway, Richard Earl;** May 21, 2014.
'49 **Damon, Henry Eugene;** January 31, 2019.
'49 **Pittman, Homer Ernest;** February 24, 2007.
'49 **Weinreb, Benjamin;** April 7, 2016.
'50 **Hunt, Virgil Davis;** February 19, 2010.
'51 **Bernstein, Arthur Lawrence;** January 14, 2002.
'51 **Remion Jr., John Baptiste;** May 11, 2015.
'55 **Roller, John Edwin;** December 21, 2019.
'57 **Parrish Jr., Daniel Jefferson;** July 12, 2016.
'59 **Carson Jr., Charles Ferdinand;** May 1, 2020.
'60 **Stowell, Robert Luther;** April 9, 2019.
'62 **Penn, Carlton Donald;** December 6, 2016.
IL A '47 **Rosche, Melvin G.;** March 16, 2015.
'54 **Tennery, Victor Joseph;** November 10, 2019.
IL B '50 **Wilk, Rex S.;** July 16, 2002.
'51 **Yahrmarkt, Richard Strickland;** October 26, 2016.
'56 **Trytko Jr., John Edward;** July 13, 2016.
'61 **Steinke, Ronald Joseph;** December 9, 2019.
IL Γ '49 **Anderson, Richard Raymond;** June 14, 2014.
'72 **Payne Jr., William Earl;** no details.
IN A '38 **Grubb, Homer Vernon;** no details.
'38 **Reveal, William Smith;** May 3, 2012.
'43 **Leber, Charles Banning;** December 21, 2018.
'48 **Ford, Charles Harold;** December 3, 2017.
'49 **Straus, Leo;** April 4, 2015.
'51 **Eflin, Pascal Jack;** February 10, 2020.
'51 **Richter, Arthur;** March 18, 2018.
'52 **Anderson, Thomas Lee;** March 15, 2019.
'52 **Argon, Ali Suphi;** December 21, 2019.
'52 **Bales, Robert Cook;** November 23, 2019.
'52 **Luckow, William K.;** no details.
'55 **Eckrich, Thomas Leon;** February 2, 2019.
'55 **Jennings, Craig Harvey;** April 9, 2018.
'55 **Matthews, Richard James;** April 3, 2019.
'57 **Boltz Jr., Charles D.;** October 27, 2014.
'57 **Steinert, E. Robert;** May 2, 2017.
'59 **Frock, Joseph Raymond;** March 30, 2019.
'59 **Genoni, Kenneth Allen;** March 23, 2020.
'59 **Mills, Eugene Arnold;** August 3, 2017.
'61 **Loverde, Albert Santo;** November 24, 2019.
'63 **Thiele, Michael Lee;** February 28, 2020.
'68 **Sutton, James Scott;** no details.
'72 **Browning, Clifford William;** April 18, 2020.
IN Γ '58 **Mantey, John Paul;** January 20, 2019.
'59 **Lane, James Cooper;** July 6, 2017.
'59 **Menold, Ernest Robert;** August 6, 2019.
IA A '49 **Sieck Jr., Albert Martin;** November 1, 2017.
'52 **Ferguson, Max Allen;** March 6, 2017.
'61 **Lorimor, Orval George;** August 12, 2015.
IA B '56 **Dunlavy, Richard Lee;** June 15, 2003.
KS A '49 **Innis, Elbert Eugene;** October 19, 2015.

'49 **Kliewer, Max Erwin;** February 17, 2020.
'49 **Rozich, Frank John;** March 18, 2019.
'55 **Peyton, Edwin Bradley;** August 28, 2017.
'56 **Arrowsmith, Peter Dean;** April 21, 2018.
KS B '74 **Canderan, Richard Lee;** September 20, 2019.
KY A '42 **Drake Jr., Robert Mortimer;** February 20, 2020.
'49 **Murray, George Thomas;** March 22, 2020.
'59 **Vickers, Henry Clay;** October 3, 2019.
'65 **Stout, James Douglas;** March 6, 2020.
LA B '38 **Graugnard, Jean B.C.;** no details.
'40 **St Clair, Jack Bernard;** April 14, 2019.
LA Γ '59 **Blackwood, Alan Thomas;** September 8, 2012.
'62 **Schwabe, Klaus Hermann;** March 17, 2020.
ME A '42 **Worster, Arthur Roscoe;** no details.
MD A '42 **Bradford, Edward Lee;** no details.
'43 **Dubs, Marne Arthur;** February 1, 2020.
'49 **Bailey, John Richard;** December 18, 2001.
MD B '50 **Blair Jr., Robert Jerome;** June 5, 2001.
MA A '46 **Wyczalek, Floyd Anthony;** August 4, 2018.
'56 **Danti, Bernard Richard;** October 4, 2017.
MA B '44 **Mathews, Warren Edward;** no details.
'46 **Gusman, Samuel;** no details.
'60 **Ricketts, Myron Vernon;** May 5, 2020.
MA Δ '48 **Cranitch, Robert Daniel;** February 21, 2020.
'48 **Magison, Ernest Carroll;** December 3, 2011.
'51 **Rowe, Robert Marsh;** September 26, 2009.
'53 **Brown Jr., Arthur Leonard;** April 8, 2020.
'53 **Hassett, Frank Carey;** March 26, 2020.
'03 **Sullivan, Richard Andrew;** no details.
MA E '38 **Garland, Chesley Fisher;** January 4, 2015.
'52 **Bullard Jr., Alvan Henry;** June 3, 2013.
'54 **Marks, Robert Austin;** March 14, 2020.
MA Z '57 **Welch Jr., John Francis;** March 1, 2020.
'79 **Conners, Robert;** December 6, 2018.
MA Θ '72 **Crugnola, Aldo;** September 4, 2018.
MI A '40 **Hoffman, John William;** January 6, 2019.
'48 **Evans, Merthyn Edwin;** August 1, 2014.
'48 **Schuppert, Arnold Nestle;** January 4, 2019.
'49 **Shulman, Herbert;** February 28, 2013.
'50 **Fair, Paul William;** no details.
'55 **Puffer, Jack Dale;** July 14, 2014.
MI B '55 **Sager, Bonaventure Frank;** October 29, 2019.
MI Γ '42 **Matson Jr., Leslie Emmet;** February 10, 2019.
'48 **Belshaw, Gordon Charles;** April 12, 2020.
'48 **Daniel, Richard Irvine;** March 27, 2020.
'48 **Meyers, Walter Patrick;** no details.
'49 **Kellenberger, George E.;** June 7, 2003.
'51 **Bliven, Charles Vincent;** no details.
'51 **Wagner, Robert T.;** October 18, 2019.
'54 **Cline, James Edward;** June 12, 2016.
'54 **McCord, Richard Keith;** February 22, 2020.
'55 **De Haan, James;** June 26, 2015.
'57 **Katz, Marvin LaVerne;** November 22, 2019.
'59 **Herm Jr., George C.;** November 16, 2019.
'60 **Gieske, Dale W.;** no details.
'60 **Laakaniemi, Richard Norman;** May 27, 2018.
'77 **Mumford, Edwin Bruce;** no details.
MI Δ '55 **Nickol, Henry A.;** February 27, 2020.
MI E '64 **Lavery, Thomas Jefferson;** no details.
MI H '73 **Gagnon, Ronald John;** February 19, 2015.
MN A '42 **Markus, Lawrence;** January 18, 2020.
'48 **Montague, Robert Paul;** November 28, 2010.
'50 **Konkel, John Anthony;** November 12, 2018.
'52 **Polacek, James Hills;** April 25, 2020.
MS A '44 **Scott, Charley;** August 1, 2012.
'52 **Kaiser Jr., Charles Hayden;** April 25, 2020.
MO A '50 **Peterson, Ray Duane;** April 5, 2020.
MO B '50 **Church, Charles Henry;** July 7, 2019.
'59 **Holley, Henry Jones;** April 16, 2007.
'65 **Bradford, Bruce Harold;** June 4, 2014.
MO Γ '40 **Eibert, John;** March 15, 2016.
'49 **Roark, Houston Price;** September 23, 2007.
MT A '42 **Jeffries, William Raine;** no details.
NE A '59 **Frenzel, Gary Gordon;** February 8, 2020.
NJ A '45 **Schlichting, John;** April 28, 2020.
'51 **Mann, William Lawrence;** April 4, 2020.
'56 **Kushner, Irwin;** June 5, 2004.
NJ B '50 **Caspar, John Adam;** April 26, 2020.
'50 **Grimm, John Ott;** May 2, 2019.
'51 **Osifchin, Nicholas;** February 12, 2020.
NJ Γ '41 **Mauriello, Michael Matthew;** March 26, 2020. *[Cent.]*
'49 **Powell, Edward Chase;** March 7, 2012.
'50 **Dickson, William Henry;** no details.
'65 **Mountford Jr., Robert Henry;** January 2, 2004.
NM A '42 **Horne, Jack Goddard;** July 7, 2019.
NY A '75 **Bernstein, Charles William;** September 30, 2007.
NY B '51 **Squires, William Frank;** March 24, 2006.
'61 **Mann, Ronald Leonard;** April 3, 2020.
'62 **Thomas, Henry Howard;** May 6, 2020.
NY Γ '50 **Moshier, Richard Watkins;** June 22, 2016.
'51 **Carmichael, James Decator;** January 15, 2013.
'51 **Englat, William John;** May 20, 2006.
'55 **Bowman, Harlan Lewis;** September 11, 2000.
'57 **Romeiser Jr., Malcolm B.;** September 29, 2018.
NY Δ '48 **Mendenhall Jr., William W.;** February 19, 2020.

IN MEMORY

Bill Mendenhall, *New York Delta '48*, passed away at the age of 96. He was professor emeritus at the University of Alaska Fairbanks and performed much of the baseline mapping for Project Chariot, a U.S. Atomic Energy Commission proposal to construct an artificial harbor in northern Alaska. Bill helped establish the Alaska Alpha Chapter (1974), served as an Advisor for 26 years, and was selected as the 2000 ΤΒΠ Outstanding Advisor.

'51 **Cowley Jr., Robert Emmet;** December 27, 2019.
'55 **Reidenbach, Frederick N.;** February 20, 2019.
NY E '48 **Hart, Wildrick;** March 1, 2018.
NY Z '48 **Weston, Nathan;** January 10, 2006.
'50 **Wallerstein, Lawrence B.;** January 20, 2007.
'59 **Geiss, Gunther Richard;** no details.
'61 **Kaminski, Theodore;** November 19, 2019.
'63 **Langer, Paul H.;** March 11, 2020.
NY H '43 **Kuritsky, Morris M.;** no details.
NY Θ '52 **Beltracchi, Leo;** November 2, 2016.
'62 **Lepsch, James M.;** May 16, 2016.
'11 **Fahrenkopf, Michael James;** June 25, 2016.
NY Ξ '42 **Zenz, Frederick A.;** no details.
NC A '48 **Fowler, Ned Milton;** August 20, 2011.
'49 **Smith, Norfleet Nicholson;** November 19, 2019.
'52 **Ellis, Robert Giles;** February 2, 2017.
'81 **Miller, Wesley Joseph;** January 31, 2016.
NC Γ '46 **Hudson, Fitzgerald Salter;** May 9, 2003.
NC E '05 **Asemota, Imade Mary;** April 11, 2009.
OH A '42 **Roy, Donald John;** July 31, 2019.
'50 **Felsman Jr., William Otto;** no details.
'50 **Stewart Jr., Paul Van Lier;** no details.
'51 **Rush, David Harry;** February 16, 2020.
'55 **Wilk, Ralph M.;** September 12, 2015.
OH B '48 **Musat, Oliver Daniel;** April 7, 2020.
'56 **Whitacre, Gale Robert;** August 3, 2005.
'58 **Last, Larry Richard;** March 31, 2020.
'80 **Huey, Rita Marie;** February 5, 2010.

OH Γ '48 **Baron, George B.;** no details.
'50 **Banfield, Oscar Murray;** August 18, 2004.
'50 **Mayfield Jr., Raymond James;** January 17, 2014.
'59 **Hutchins, David Lee;** no details.
OH E '64 **Kovar, Daniel;** January 6, 2020.
'66 **Korzep, Stanley;** October 19, 2019.
'88 **Spring, John Walter;** no details.
OH H '63 **Von Tersch, George Lamone;** no details.
OH Θ '58 **Westerheide, Donald E.;** December 8, 2019.
OH I '51 **Kohli, Raymond Richard;** June 18, 2019.
'56 **Smith, Olin Glenn;** April 24, 2020.
OH M '09 **Janning, John Louis;** February 23, 2020.
OK A '38 **Marks, Fredrick Mortimer;** June 11, 2018. *[Cent.]*
'51 **Gorishek, Rudolph;** December 23, 2017.
'67 **Ammon, John Alan;** January 30, 2020.
OR A '43 **Ewing, Robert Clark;** July 22, 2019.
'50 **Horning, Norman Gerald;** July 23, 2016.
'56 **Hermsen, Robert William;** November 3, 2019.
OR B '93 **Sorrentino, Roger C.;** May 25, 2012.
PA A '46 **Skilton, Ronald James;** February 14, 2020.
'51 **Bevier, Louis Wells;** May 1, 2020.
'53 **Moore, Robert Wilson;** no details.
PA B '48 **Bernstein, Arthur G.;** February 8, 2011.
'65 **Melville, Joel George;** November 2, 2016.
'73 **Stockburger, Richard;** December 14, 2019.
PA Γ '48 **Neubert, Vernon Herbert;** March 3, 2020.
'50 **Cannon, Howard Suckling;** January 14, 2009.
'53 **Wiederhorn, Robert;** no details.
'83 **Slack, Steven Mark;** April 29, 2010.
PA Δ '43 **Bonn, Theodore Hertz;** April 11, 2019.
'48 **Brager, Irving Bernard;** no details.
PA E '50 **Olsson, Arthur T.;** March 4, 2020.
'50 **Remaly, Paul A.;** February 23, 2020.
'51 **Yurgartis, Watson Charles;** February 27, 2010.
'75 **Roman, Daniel John;** December 28, 2017.
PA Z '51 **Cessna, William Franklin;** no details.
'60 **Shuey, Merlin Arthur;** September 22, 2017.
PA H '48 **Reed, Robert Vaneida;** no details.
PA K '43 **Dugan Jr., John Leslie;** April 17, 2019.
SC A '48 **Cannon Jr., Henry Thompson;** no details.
'57 **Goff, Homer Buford;** April 9, 2020.
SC B '50 **Martin Jr., Walter Agnew;** no details.
SC Γ '79 **Pittman, Steven Mack;** March 9, 2018.
SD B '51 **Holt, Clayton P.;** May 5, 2002.
TN A '43 **Wilson, Hubert Neville;** April 27, 2012.
'47 **Harris, Reuben Earle;** March 19, 2012.
'49 **Kerr, Arthur Cecil;** December 6, 2019.
'51 **McGregor Jr., Wheeler K.;** June 27, 2013.
'55 **Rodgers, William Judson;** January 5, 2005.
'67 **Holmes, Thomas Barton;** November 3, 2018.
TN B '49 **Akers III, J. Clark;** February 20, 2020.
'50 **Goodman, Orris Oneal;** March 2, 2019.
TN Δ '61 **Thais, Richard Robert;** April 30, 2019.
TN E '42 **Amminger, William Leo;** August 5, 2006.
TX A '43 **Grimes, William Osborn;** July 1, 2018.
'49 **Sanders, Aubria Allen;** December 15, 2017.
'49 **Underwood Jr., James Ross;** May 16, 2012.
'49 **Weisser Jr., Herman Daniel;** November 1, 2016.
'58 **Murphey Jr., Carey Epps;** December 6, 2017.
'59 **Hall Jr., Joseph Weston;** January 19, 2003.
TX Δ '41 **Henderson, Randall;** no details.
'42 **Crim, Clifton Roy;** December 13, 2002.
'49 **Gabert, Lenard Morris;** June 6, 2019.
'51 **New, Jack Harold;** May 4, 2019.
'60 **Dyson, Norman Kenneth;** August 15, 2019.

IN MEMORY

Norman Dyson, *Texas Delta '60*, passed away at the age of 81. He flew the F-100 and F-4 in the Vietnam War, then returned to test work on weapons for the F-100, F-101, and F-4. Dyson was a U.S. Air Force fighter and test pilot, and later worked on top-secret programs, including the Lockheed "Have Blue" stealth demonstrator that led to the F-117 Nighthawk stealth attack jet.

TX E '66 **Cass, Dave Calvin;** April 22, 2000.
'66 **Power, Leonard Douglas;** August 16, 2018.
TX Z '58 **Brackin, John Willie;** no details.
TX H '65 **Smith, Roger L.;** November 11, 2010.
'69 **Morrison, Ronald Wilburn;** March 12, 2020.
'71 **Wade, David Horace;** no details.
'72 **Hillman, George Wright;** March 1, 2020.
UT A '50 **Cannon, Maxwell Richards;** August 24, 2019.
'51 **Mays Jr., Charles William;** no details.
'57 **Odekirk, Theron Glenn;** no details.
UT B '66 **Tyler, Monroe Cheney;** January 22, 2019.
VA A '49 **Schley Sr., Cooper Myers;** May 27, 2011.
'51 **Montague III, Hill;** no details.
'51 **Roth, Irwin;** April 17, 2018.
'54 **Simmonds Jr., Thomas Henry;** July 31, 2013.
VA B '58 **Harrison, Thomas Randolph;** no details.
'62 **Haile Jr., William Buckner;** November 1, 2008.
'84 **Irwin, Gary Michael;** June 4, 2019.
VA Δ '50 **Kuykendall Jr., William B.;** August 21, 2011.
WA A '61 **DeLang, William;** January 16, 2019.
'76 **Sand, Loren Jerome;** February 26, 2020.
WV A '49 **Caplinger, Milton Edsel;** February 27, 2011.
WI A '47 **Karabinus, Raymond John;** June 19, 2011.
'48 **Fry, Perry Allen;** April 15, 2014.
'56 **Dunwell, Ray Durward;** no details.
'57 **Thygeson, Robert Allen;** June 7, 2016.
'58 **Koleske, Joseph Victor;** December 28, 2019.
'59 **Dahl, William Robert;** May 2, 2020.
'59 **Meyer, Dennis Paul;** August 13, 2006.
'65 **Norman, Robert;** May 17, 2019.
WI B '49 **Feess, William Andrew;** no details.
'52 **Alborn, Robert Harold;** February 28, 2020.
'53 **Cameli, Dominic Michael;** May 19, 2016.
'58 **Maierle, Richard Paul;** March 13, 2018.
'60 **Rampetsreiter, Robert Henry;** April 18, 2020.
'63 **Menning, Timothy Louis;** November 14, 2019.
WI Γ '49 **Zelazo, Nathaniel K.;** November 22, 2018.
'75 **Pease, Mitchell S.;** October 26, 2004.
WY A '43 **Becker, Clarence F.;** December 13, 2017.

the heritage society

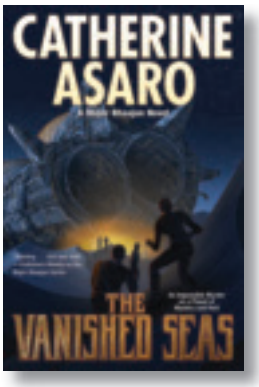
The Heritage Society was created to recognize those who include Tau Beta Pi in their estate plans. Becoming a member can help the Association achieve its mission. For more information, email Sherry at sherry.jenningsking@tbp.org or visit www.tbp.org/giving.cfm.

In Grateful Appreciation of Pre-Club Member-Contributors

Alumni Giving continued from page 27.

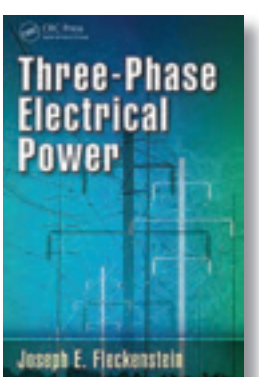
AL A Roes Jr., Bill Lannis '10
AL B Massey, Dianne Joy '70
Triantafillu, Dimos '07
AL E Harrison, Keith '77
Ingersoll, Dale Marvin '15
AZ A Harris, Michael '64
Kerr, Richard Lincoln '92
Pratt, Roger Davison '67
AZ B Carnes, Mark E. '87
AR A Johnson, Cody '15
Troillett, Ronald Joseph '88
CA A Ransom, Roger H. '49
Schade, Cristy Mark '68
Winslow, Stephen P. '82
CA B Helfrey, Paul Francis '51
Yang, Fei '11
CA Γ Bay, Jason '05
Chrisman, Keith F. '61
Evans, Philip Calvin '69
Hartley, James Douglas '80
Martin, Vince Lionel '60
Padulo, Katharine A.S. '68
Padulo, Louis '53
Tiederman Jr., William '60
CA Δ Curd, Brian Anthony '07
Dang, Toan C. '85
Manrique, J. Edgardo '72
Mehnert, Warren Leon '65
Roberts, Harry '73
Young, Tina Ting-Ting '88
CA E Delettrez, Jacques '65
Gorder, Matthew S. '81
Kawaguchi, John M. '64
Weaver, Paul W. '67
CA H Alam, Shayela '02
CA Θ Valenzuela, Robert D. '13
CA I Doria, Robert Carl '89
Villa, Warlito Posadas '97
CA K Palacios, Ronald N. '96
Smerk, Matthew E. '06
CA Λ Grathwell, Travis Jacob '06
Masuda, Martin Dale '70
Murchison, Gary Scott '77
Woodworth, Garrett Lee '17
CA M Kraemer, Ronald Ray '86
CA N Huff, William J. '80
Lynde, Michael Sean '06
Marciuska, Algis Jonas '86
CA P Bondi, Bryce Enneking '14
Dimond, Christopher N. '74
Tatum, Tiffany '13
CA Y Martin, Daniel '81
McNinch, James E. '82
Mudd, Lindella Rose '06
CA X Rayes, Ramseen Bill '18
Wallace, William Russell '19
CA Ω Morris, John Matthew '95
CA AB Geierman, Joshua O. '04
CO A Hudiburgh Jr., Gary W. '73
Phelps, Brian Robert '87
CO B Beeler, Samuel Logan '55
Harris, Robert Jay '72
Kraft, Virgil Don '55
Newcomb, Greg Michael '06
Roelker, James H. '51
Wallace, Richard W. '60
CO Z Henry, Karen S. '79
Wetzig, John Marshal '13
CT A Sheppard, Alan T. '55
Watson, James Eugene '51
Weertman, Willem L. '47
CT B Peltzer, Robert Gerard '57
Steffen, Clyde John '66
Toth, Randal Bruce '69
CT Γ Davenny, Benjamin '98
DE A Ballintyn, Nicolaas J. '75
White, Maurice Walter '89
DC B Markowski, John E. '98
DC Γ Stepnowski III, Stanley '96
FL A Phillips, Donald Lee '52
FL B Ferrante, Michael A. '75
FL Γ McCoy, Carson Emily '02
Rayburn, James Lee '76
FL E Epstein, Justin P. '15
FL H Martin, Omar Sean '93
Shatto, Blake Lee '10
FL Θ De Coriolis, Paulette E. '91
Jean Baptiste, Sophia '15
GA A Cikanek III, Harry A. '82
Crayton, Render '54
Flood, Paul M. '58
Horldt, Philip Christian '61
Parker, Elton L. '47
GA B Taylor, Danielle C. '96
ID Γ Khanal, Mandar '76
IL A Boresi, Arthur Peter '48
Niehaus, Jeffrey Alan '74
Schunneman, Robert F. '52
Variakojis, John '55
IL B Chana, Howard E. '53
Gaynor, Michael Paul '86
Rosen, Edward Marshall '52
Yi, Joseph Choog Sik '60
IL Z Steinkoenig, Glen Lee '95
IN A Andrews Jr., Paul D. '59
Baum, Kevin Lynn '89
Butcher, David N. '68
Fleck, John William '48
†Frock, Joseph R. '59
Gatons, Alison Michelle '14
Graham, James Gordon '55
Haas, Donald Frank '67
Hollandbeck, Floyd '60
Hunsicker, James Alan '64
Jochem, Stephen Kent '73
Kimber, Douglas A. '80
Kinnen, Edwin '49
Kubacki, Edward Frank '63
Linder, Frank William '66
McLaughlin, Charles C.'70
Mendelson, Robert M. '47
Morgan, Christopher D. '88
Porter, James C. '59
Schulze Jr., William Eric '55
Thorson, Robert T. '61
Van Fossen, K. Wayne '56
Wetz, John M. '57
Wolf, Charles Frank '69
Ziniel, Larry Wayne '79
IN B Gilbert, Kevin William '92
King, Fred Stuart '71
Moorman, Jay Richard '94
IN Γ Colligan, Jerome Arthur '61
Conness, Kent Michael '78
Durr, Christopher Jacob '10
Harkins, Scott Patrick '89
Kiphart, Kerry '83
Mertz, Lexi Elizabeth '20
Shilling, David C. '10
IN Δ Abraham, Edward E. '63
Sinko, Kenneth Michael '72
IN Z Peter, David A. '14
IA A Bice, Don Corwin '49
KS A Coudeyras, James C. '94
Cronemeyer, Donald C. '45
Runser, Robert James '96
KS B Jambor, Jacqueline Sue '94
Longacre, Charles Jacob '74
KY A Nelson, Donald Palmer '70
Sims, Daniel James '84
KY B Insko, Darren Wayne '89
LA A Hicks, Richard Wayne '62
Hollier, Joseph Keith '79
Kumar, Anil '68
Lafleur, Stephen Alan '75
Reed Jr., Thomas P. '81
LA B Le Blanc, Robert Arthur '74
LA Γ Icenhower, Kenneth L. '85
LA Δ Judice, Reggie Paul '75
Pham, Jerry '90
Simon, William Emile '63
Teoh, Chee Boon '89
ME A Evenson, Paul Roald '85
Goodwin, Alice M. '00
MD A Ulanowicz, Robert E. '64
MD B King, Daniel C. '61
Reese, Mark Scott '13
Spencer, Donald Hardy '58
MD Γ Scioli, Blaise E. '84
MD Δ Balieiro, Fellipe F. '09
MA A †Danti, Bernard Richard '56
Hoffman, Allen Herbert '63
MA B Anderson, Martin David '85
Cano Ruiz, Alejandro '91
Hamilton, Bruce K. '69
Herrick, Groves Eckley '63
Moomaw, Dick Frank '76
Parente, Robert Bruce '58
Schmidt, Robert Max '58
MA E Blecha, Mark Alan '85
Bodette, Judy Regina '88
Sonnichsen, H. Eric '73
Tyson, Rich P. '83
MA H De Winter, Theo A. '56
MI A Popiel, Robert Alan '70
Warnke, Gary Neil '59
MI B McKindles, Gerald T. '50
McQuarter, Charlene R. '95
Schmitz, Eugene Joseph '52
MI Γ Banghart, Edmund K. '83
Betz, David Karl '95
Coffey, Thomas Charles '60
Forche, Robert F. '64
Geck, Paul Emil '67
Hawk, Norman Eugene '56
Kumbier, Timothy Jon '81
Roush, Craig Walter '50
Schultz, Lloyd Ellman '49
Sherman, Steven R. '92
Singhi, Amit S. '89
Vanden Bogaerde, Jack '53
MI Δ Ryntz Jr., Edward F. '61
MI E Benninger, Carl George '72
Whitehead, Tonya J. '17
MI Z Petzold, Merlin Albert '56
MI H Bowden, George F. '48
Curtis, Robert Owen '78
Orr, Christopher Wayne '07
MI Θ Quinn, Tom Ryan '18
MI I Sampson, Tyra Marie '05
MN A Kropp, Karl Matthew '80
Wheeler, Robert M. '63
Zollars, Richard Lee '68
MS A Zumbro, Caleb Ellison '11
MO A Bensiek, William F. '55
Hippe, Thomas Gillman '75
Renner, Ray D. '88
Schaper, Justine Emily '14
Slaten, Neal G. '70
Woods, John Walton '70
MO B Hitt, Gerald Wayne '69
Kuhn, Carol Elizabeth '62
Russell, Bruce Michael '75
Schafer, Robert Philip '52
Taylor, Donald Dean '73
MO Γ Ballintyn, Nate Daniel '19
Hironaga, Jon Kenich '90
Mattione, Richard Paul '76
Peters, Christopher J. '09
Reitmeier, R. Tom '62
Tucek, Joseph Andrew '03
Wolf, Robert Joseph '92
MO E Bernabeu Penalba, Sergio
Lyons, Frank T. '59 '20
MT B Derakhshanfar, Moe '12
NE A Haffke, Nicole Annette '99
Roelle, Wayne Berton '55
NV A Hull-Stancliff, Erika K. '05
NJ A Chiarello, David M. '66
Smith, Alexander Paul '07
NJ B Grubin, Jeremy '05
Kelly, Kevin Thomas '79
Miller, Victoria Suzanne '85
Vorndran, Ronald Noel '61
NJ Γ Amato, Ethel '09
Mitchell, Morton Muni '62
Scarola, Leonard S. '63
Stanko, Roger John '72
Walerko, Emil Joseph '75
NJ Δ Bolling, Joseph C. '15
Lugannani, James C. '81
NM A Gentle, Phillip Dean '80
Swift, Theresa Janine '89
NM B Nava, Edward John '79
NM Γ Schafer, Nic Harp '11
NY A Herman, Mark Norman '63
NY B Chamberlain, Steven C. '68
Johnson, Gilbert '66
Mogish Jr., Andrew '78
Rzepka, William '64
NY Γ Furman, Bill Nelson '82
NY Δ Barrett, Stephen N. '07
Capron, Ann Louise '61
Dumouchel, Matthew P. '08
Gordon, Susanna P B '87
Hughes, Bill Morris '82
Kumnick, Albert Joseph '67
Otto, Jeffrey Peter '93
Russell Jr., Robert H. '49
Swanson, Warren J. '94
NY Z Kilanowski, David R. '73
NY H Wong, Tat C. '81
Zipper, Abraham '75
NY Θ Cipollina, Joseph D. '09
Farney, Reginald Alan '81
Jerabeck, Valerie B. '76
Snyder, Lisa Francine '83
Subramanian, Shankar '68
van der Vorst, Lisa M. '93
NY I Capuzzi, A. Michael '01
Diskin, Glenn Stephen '84
Simms, Richard '59
NY Λ Glenbocki, Alexander J. '70
NY M Spring, Deborah Ann '76
NY N Chen, Lisa Ann '84
Hughes, Patrick Leo '89
Reep, Larry Steven '73
Scaccia, Carl '68
NY Ξ Defeo, Paul '93
O'Brien, Paul '60
NY O Imbrogno, Christina '14
Imbrogno, Joseph M. '12
NY Π Enright, Matthew T. '91
Mcclellan, Nathan Allen '11
NY P Hicks, Kyle Kaku '10
NY Σ Eshenaur, Craig R. '11
NC A Brewer Jr., Albert S. '08
Ferguson, Roger George '73
Rudisill, Jacob M. '75
Smith, Stephanie Lynn '05
ND A Brakke, Bruce L. '59
OH A Anglin Jr., Richard Lee '67
Rohn, Amanda Elaine '03
Thompson, William Lee '60
OH B Nathan, David Levi '87
Schaefer, William '67
OH Γ Bao, Matt '14
Boepple Jr., Emerson A. '52
Dillon, Stephen Roy '69
Kramer, David Joseph '72
Nunnikhoven, Joe D. '63
Rankovic, Vladimir '85
Zelek, Jeffrey Peter '04
OH Δ Demann, David C.'87
Lippian, Joseph Michael '71
Logston, Robert Wesley '80
OH E Amtsberg, Donald G. '51
OH Z Ewing, Tom Forbes '73
OH H Raley, Jeremy Alan '05
Rouser, Kurt Paul '11
Sallberg, Scott Anthony '03
OH Θ Glasgo, Brock Philip '10
Kotecki, David E. '81
OH I Duling, Ryan Robert '03
Homan, Gregg G. '86
OH K Haslett, Kelly '20
OH Λ Tataseo, George Michael '84
OH M Blue, David Walter '95
OK A Dresback, Kendra May '99
OK Γ Lakhani, Salim '85
OR B Qi, Lijie '98
PA A Flicker, Eric Lee '71
Newbury, Dale Elwood '69
Polyniak, Gregory J. '95
Shumbata, Francis John '67
PA B Johnson, Michael B. '08
Koller, Keith Scott '81
Raynar, Karl A. '90
PA Γ Kunze, Jay Frederick '54
Valarezo, Christopher J. '06
PA E Bera, John Peter '70
Oberholzer, David J. '68
Wingert, Charles David '71
PA Z Bailey, Patrick E. '94
Griffin, Phyllis Kay '64
Lunde, Harold R. '69
PA H Larson Jr., Kenneth C. '56
Van-Kuren, Ralph C. '59
Zahn, Taylor Jordan '14
PA Θ Deguilio, Andrew Phillip '98
Kamedulski, Gregory E. '76
Mahle, W. Stephen '61
Morrison, Alan E. '69
Mullee, William A. '54
PA I Mulkern, Kevin Michael '79
PA Λ Becse, Robert Emery '90
Casey, Michael Paul '89
Filey, Justin Paul '99
Murphy, William John '80
Sawyer Jr., Stephen G. '98
PR A Acevedo, Jorge L. '66
Burgos-Rubio, Concepcion '89
Figueroa Medina, Alberto '97
RI B Turinsky, Paul J. '66
SC A Elrod, William Corbin '49
Finn, Joshua William '08
Krantz, Matthew David '04
Morrah, James Edward '53
Waddington, David M. '84
SC B Mortimer, Travis S. '06
Quinton, Michael David '73
Simontis, Nick R. '00
SC Γ Burns, James A. '60
Nicholson Jr., James C.'95
Sherard, Joseph Sullivan '73
SD A Hanley, Kathleen Faye '77
Kirk, Steven James '74
SD B Konda, Travis Frank '98
TN A Baxter, Van David '75
Beall Jr., Samuel E. '42
Coleman, Wayne Allen '63
Davis, Chad L. '07
Lambert, Lisa Renee '90
Lewis, James Michael '73
McDavid, Ernest K. '61
Newberry, Hope M. '16
Pitcher, William F. '60
Romoser, Barry K. '60
Scott, James Louis '52
TN Γ Chandley Jr., Charles A. '58
TN Δ Almaatouk, Jawad F. '20
TN E Blackwell, Malissa B. '87
Johnson, William P. '82
Jones, Lisa Gaye '80
Montgomery, Van A. '86
TN Z Price, Jason Lee '09
TX A Gooch, Jerald K. '75
Hodkin, Michael T. '69
TX Γ Droste, Carl Sanders '61
Grueneich, Grant R. '65
Horwitz, Michael E. '57
Weber, C. Alan '74
TX Δ Brown, Robert Calvin '51
Johnson, Max Edward '97
Kanipe, David Brenham '70
Vance, Cherish Christony '13
TX E O'Day Jr., Dusty Lee '16
Roxburgh, Charles D. '62
TX Z Hamm, Donald Charles '67
TX H Chojnacki, John Tyler '12
Fagan, John Edward '67
Smart, Eddie Eugene '69
Stokes, Brian Michael '06
TX K Morris, Gladys Marie '78
Morris, Lynn '77
UT B Bills, Delbert Ray '62
Evans, Kyle Brent '21
Kofford, Kevin Rex '15
Pittard, Matt Thurlow '01
UT Γ Wheeler, Paul A. '78
VT A Farrow, Cedric Harry '61
VA A Cahen Jr., George L. '70
VA B †Bonin, Richard Allen '77
Epperly, William Robert '56
Glass, Harold Chiswell '48
Anonymous '13
WA A Sabado, Maurice M. '75
WA Γ Zorich, John Bernard '80
WV A Alexander, Douglas E.'60
Morris, Melissa Lynn '06
WV B Strada, John Thomas '69
Titlow, Brian E. '97
WI A Schansberg, Todd W. '82
Tibbitts, Lewis Wilson '53
Valdivia, Christopher J. '95
Vollstedt, Thomas J. '70
WI B Gauthier, Michael T. '93
Hughes Jr., John J. '54
Mullaney, James Jerome '82
Ries, John N. '63
Treadwell, George W. '52
WI E Bucheger Mazur, Stacey '88

Catherine A. Asaro, Ph.D., *California Epsilon '78*, will see the publication of her next book, *The Vanished Seas*, on July 7, 2020. It is a stand-alone installment in the Major Bhaajan series of science fiction mysteries. Asaro is a two-time winner of the Nebula Award and has received multiple Hugo nominations for her fiction. *The Vanished Seas* is her 31st novel and is published by Baen and distributed through Simon and Schuster. She earned her Ph.D. in chemical physics from Harvard and a B.S. in chemistry from UCLA.

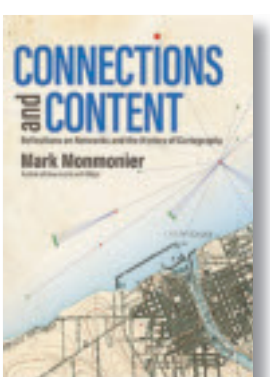


Bruce T. King, P.E., *Colorado Beta '78*, authored *The New Carbon Architecture: Building to Cool the Climate*. The book examines the innovations in architecture and construction that can make buildings part of the climate solution. A structural engineer for 40 years, Bruce is also the founder and director of the Ecological Building Network. The book was published by New Society Publishers and an excerpt from this book, with images, begins on page 14.

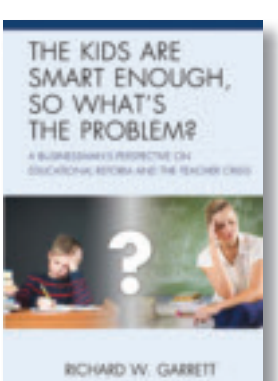
Joseph E. Fleckenstein, *Pennsylvania Gamma '54*, has written *Three-Phase Electrical Power*. The textbook addresses all aspects of three-phase power circuits. Joseph has a B.S. in mechanical engineering, has published 38 items, and is inventor or co-inventor of seven U.S. patents and numerous foreign patents. He is an independent consultant and former commissioned officer in the Corp of Engineers. The book was published by CRC Press.



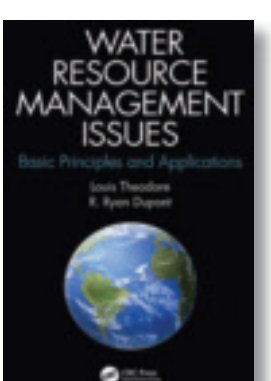
Mark Monmonier, Ph.D., *Maryland Alpha '64*, shares the relationship between networks and maps in his e-book *Connections and Content: Reflections on Networks and the History of Cartography*. He is Distinguished Professor of geography at Syracuse University, author of 20 books, and was editor of *Cartography in the Twentieth Century the Encyclopedia*. His B.S. degree is in engineering mechanics from The Johns Hopkins University. The book was e-published in August 2019.



Richard W. Garrett, Ph.D., *Indiana Alpha '62*, authored *The Kids Are Smart Enough, So What's the Problem?* The book examines problems in K-12 education using "engineer thinking" with a focus on reaching struggling students and encouraging teachers. Garrett's B.S. and M.S. degrees are in industrial engineering from Purdue University. He worked for 27 years with Eli Lilly and Co. The book was published by Rowman & Littlefield.



Louis Theodore, Sc.D., *New York Xi '55*, and **R. Ryan Dupont,** Ph.D., *Kansas Alpha '77*, have co-authored *Water Resource Management Issues: Basic Principles and Applications*. The book examines the technical and scientific emerging issues of pollution prevention and the production of safe drinking water. It was published December 2019 by CRC Press. Theodore has been an educator at Manhattan College and Dupont is a teacher and researcher at Utah State Univ.



Call for Authors

The Editor of *The Bent* is frequently searching for well-written, general interest, feature articles for the magazine. Many of you have the appropriate experience, are qualified, and capable of preparing such a feature. If you have a topic that you believe would be suitable, email proposals to media@tbp.org. Members working on interesting research or design projects are encouraged to submit an article. Manuscripts should be 1,000-3,000 words, double-spaced, and submitted as a text or MS Word document. Publishing decisions cannot be guaranteed.

Executive Council Meetings

Met by WebEx on July 10, 2019

The Council approved three new policies: Convention Agenda and Minutes; Gift Acceptance; and Credit Card Points. The Council approved the FY20 Continuing Budget Resolution. Rodger F. Smith, *WI A '64*, was reappointed to the Trust Advisory Committee through 6/30/22.

The Convention Program Planning Committee (CPPC) approved the following members to serve in various roles at Convention: Ronald M. Hickling, *CA E '80*, Convention Chair; Jason A. Abellada, *FL A '04*, Parliamentarian; Scott E. Fable, *CA T '96*, Convention Secretary; George K. Miyata, *WA D '10*, Credentials Committee Chair; Elson Y. Liu, *AZ A '01*, Teller's Committee Chair; and Christopher J. Creveling, *UT A '13*, Convention Photographer. The CPPC approved that all voting delegates attending the 2019 Convention serve on a committee or task force.

The Strategic Plan was updated with requested changes and the Governance Committee charter was approved.

Met by WebEx on August 14, 2019

The Council reappointed James D. Froula, *TN A '67*, to the Editorial Board to a term ending 6/30/22; and appointed Joseph P. Blackford, *DC G '95*, as a District 4 Director to a term ending 6/30/22. The Council approved a fourth Director for District 12.

The Council approved the following charters: Executive Committee; Chapter Support Committee; and the Program Support Committee.

The Chapter Support Committee will share with District Directors, Director of District Program, and Alumni Chapters, spreadsheets developed by Assistant Director of Member and Chapter Services, which includes information on chapter reporting and eligible vs. candidates/initiates.

The Council approved the following policies: Multi-Role Association Officials; Nomination of Association Officials; Trust Management; and rescinded the Emeritus Adjunct Policy.

The Council approved the FY20 budget and fund allocations for FY19. The inspection for Tau Beta Gamma at Georgia Southern University was approved and the Dell Member Benefit was approved.

Met by WebEx on September 11, 2019

The Council approved Steven R. Harper, *IL A '06*, and Suzette Morales, *NC A '09*, both as District 4 Directors for a one year term ending 6/30/20; and Melissa L. Morris, *WV A '06*, as a District 16 Director for a three year term expiring 6/30/22. The EC approved: Engineering Futures and Fellowship Board Reappointments; and the Emeritus Adjunct Engineering Futures Facilitators Conversion.

President Wayne Paugh continued to work with the Director and Undersecretary of the U.S. Patent and Trademark Office to obtain an interview for *The Bent* and to secure a U.S. Senate resolution in the upcoming Congress.

Councillor M. Youssef reported the CPPC's recommendations for task forces and committees at the 2019 Convention were sent to HQ. The EC discussed timing for recommendations in the Convention planning cycle and the impact on Convention preparations.

Met in Columbus, OH, October 9-12, 2019

The EC appointed District Director Allen D. Erickson, *NM G '14* to the ICE Committee to a term ending 6/30/20 and reappointed District Director Thomas A. Pinkham IV, *MA E '88*, to the ICE Committee to a term ending 6/30/22.

The EC passed the following recommendations: An investment advisor be hired for the ΤΒΠ Trust; Institute Term Limits for the TAC by approving the TAC charter; ΤΒΠ should adopt an investment spending policy and reserve fund policy to be reviewed by the EC Finance Committee and ratified by the EC at the beginning of each fiscal year. Councillor S. King-Monroe charged the Finance Committee to identify three TAC member recommendations by the November EC Meeting and to amend the TAC Charters such that "5-year" term limit be amended to read "3 years." The EC approved the following charters: District Program; Engineering Futures; Alumni Affairs; and the Ritual Program. The Position Descriptions of the Director of Engineering Futures and Rituals were approved.

Election of New Officers of the 2020 Executive Council, conducted by written ballot, are as follows:

C. Craig Smith, President; George J. Morales, Vice President; Scott E. Fable, Treasurer; and Rachel K. Alexander, Secretary.

Met by WebEx on November 13, 2019

The Council appointed Teresa J. Hutton, *WI B '91*, as District 8 Director to a term ending 6/30/22.

President Paugh reported on his attendance at Colorado Gamma's initiation, met with their Chief Advisor Matthew H. Gordon, *CA G '86*, and plans to visit UC Denver for their initiation. Vice President Smith and Executive Director Gomulinski met to discuss HQ activities and operational-related policies. Mr. Gomulinski discussed the Georgia Southern inspection and is waiting for all reports to be submitted to HQ. Additional inspection information and installation assignments will be discussed at the December EC meeting. Councillor Alexander attended the CA L informational session; identified potential advisors for the chapter, and will participate in the CA U initiation.

Met by WebEx on December 11, 2019

Councillor S. King-Monroe moved to establish a task force to solidify Tau Beta Pi's diversity and inclusion policy, led by Executive Director Gomulinski and formed by 12/31/19. Councillor M. Peterson discussed the structure of the Strategic Plan tracking spreadsheet and offered to turn into a useable form; ID action items and the responsible party.

District Conference assignments and due dates for filling out the form were discussed. Councillor S. King-Monroe indicated the Finance Committee would look at the cost of attending District Conferences and in-person EC meetings.

Your fellow Tau Bates are interested in news about you. Send items about civic activities, honors won, weddings, promotions, etc. to Tau Beta Pi, P.O. Box 2697, Knoxville, TN 37901-2697 or to *dylan@tbp.org*. Material for publication must be received by August 1 for the **Fall** issue and November 1 for the **Winter** issue. Include name, address, chapter/class year, and email address or phone number. Thank you!

Colorado Epsilon

Ben G. Larkin, Ph.D., '13, was appointed president of ListenUp, a Denver retail store. He joined ListenUp in 2007 as a member of the sales staff, previously served as executive vice president, and has B.S. in electrical engineering and MBA degrees from the University of Colorado at Denver.

Delaware Alpha

Terry F. Neimeyer, P.E., '77, was awarded the Icon of Industry by the Maryland Society of Professional Engineers for significant impact on the community and the engineering profession. He joined KCI Tech. in 1977, named president & COO in 1995, served as CEO from 1999 to 2018, and is Chairman of the Board.

Illinois Alpha

Louis J. Lanzerotti, Ph.D., '60, was awarded the 2020 American Institute of Aeronautics and Astronautics James A. Van Allen Space Environments Award. He is a distinguished research professor of physics at NJIT known for shedding light on the space environment around Earth and its impact on hardware in space.

Louisiana Alpha

Kenneth J. Krefft Jr., P.E., '03, has joined the U.S. Forensic Lafayette team as a professional engineer. Previously, he served as a project engineer for various engineering design and construction projects. He obtained a B.S. in civil engineering from Louisiana State University.

Massachusetts Beta

Alexander K. Bardow, P.E., '80, celebrated 25 years (March 2020) as the State Bridge Engineer at the Massachusetts Department of Transportation. In addition to being the longest tenured State Bridge Engineer in Massachusetts, he is also the most senior State Bridge Engineer in the entire United States.

Puerto Rico Alpha

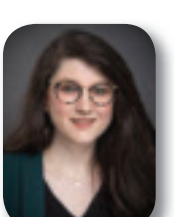
Marla E. Pérez-Davis, Ph.D., '83, has been named director of NASA's John H. Glenn Research Center in Cleveland, OH, where she has served as interim director since October 1. She earned her B.S. (University of Puerto Rico Mayaguez) and M.S. (University of Toledo) degrees in chemical engineering.

Rhode Island Beta

William J. Roman, '09, received the third highest civilian service award from the Dept. of Navy. He is lead engineer of the Naval Undersea Warfare Center Division of Newport's submarine combat & weapons control future capabilities. His B.S. degrees in biomedical and electrical engineering are from Univ. of Rhode Island.

Tennessee Zeta

Noelle Currey, Ph.D., '91, was named the Ike Zeringue Engineer of the Year by the Tennessee Valley Authority (TVA) for a programming solution that checks electrical drawings with 100 percent accuracy. She is a TVA project engineer with eight years of service and a BSEE from UT-Chattanooga.



Texas Delta

Catherine Reid, P.E., '12, is a Houston Engineers Week 2020 Young Engineer of the Year, nominated by the Texas Institute of Transportation Engineers. She has six years experience as an engineer at Gunda Corp., and has B.S. and M.S. degrees in civil engineering from Texas A&M University.

FIRST DEMONSTRATION FLIGHT: NASA COMMERCIAL CREW PROGRAM

From left to right: NASA Astronauts Bob Behnken and Doug Hurley.

Crew Dragon (also known as Dragon 2).

Louisana Beta and Missouri Gamma

NASA astronauts **Robert L. Behnken,** Ph.D., *MO G '92*, and **Lt. Col. Douglas G. Hurley,** *LA B '88*, were the first human crew for SpaceX's Crew Dragon capsule.

On March 2, a Falcon 9 rocket launched with cargo arriving at the International Space Station (ISS), and on March 8, returned to Earth.

It became the first American spacecraft in history to autonomously dock with the ISS.

Technicians at Cape Canaveral Air Force Station prepared the vehicle for launch that will kick-off Demo-2, a historic test mission that is sending the two Tau Bate astronauts to the ISS. That lift off took place on May 30 from Pad 39A at NASA's Kennedy Space Center, after a scratched attempt on the 27th.

This returns U.S. human spaceflight capability for the first time since the Space Shuttle Program was retired in 2011.

Hurley's wife **Karen L. Nyberg**, Ph.D., *ND B '94*, is a retired NASA astronaut and Behnken's wife K. Megan McArthur is an active NASA astronaut. You can visit spacex.com for more information about the spacecraft and astronauts.

Texas Kappa

Jerry W. Harness Jr., '03, is a Houston Engineers Week 2020 Young Engineer of the Year, nominated by IEEE. He is an electric transmission planning engineer at CenterPoint Energy, holds a B.S. in electrical engineering from Prairie View A&M, and serves as webmaster for the TX Gulf Coast Alumni Chapter.

Washington Beta

Daniel J. Campbell, P.E., '88, was awarded Engineer of the Year by the American Council of Engineering Companies (ACEC) Washington for leadership, mentorship, and projects. He is COO at GeoEngineers, having joined the company in 1989. His bachelor's degree in civil engineering is from Washington State University.

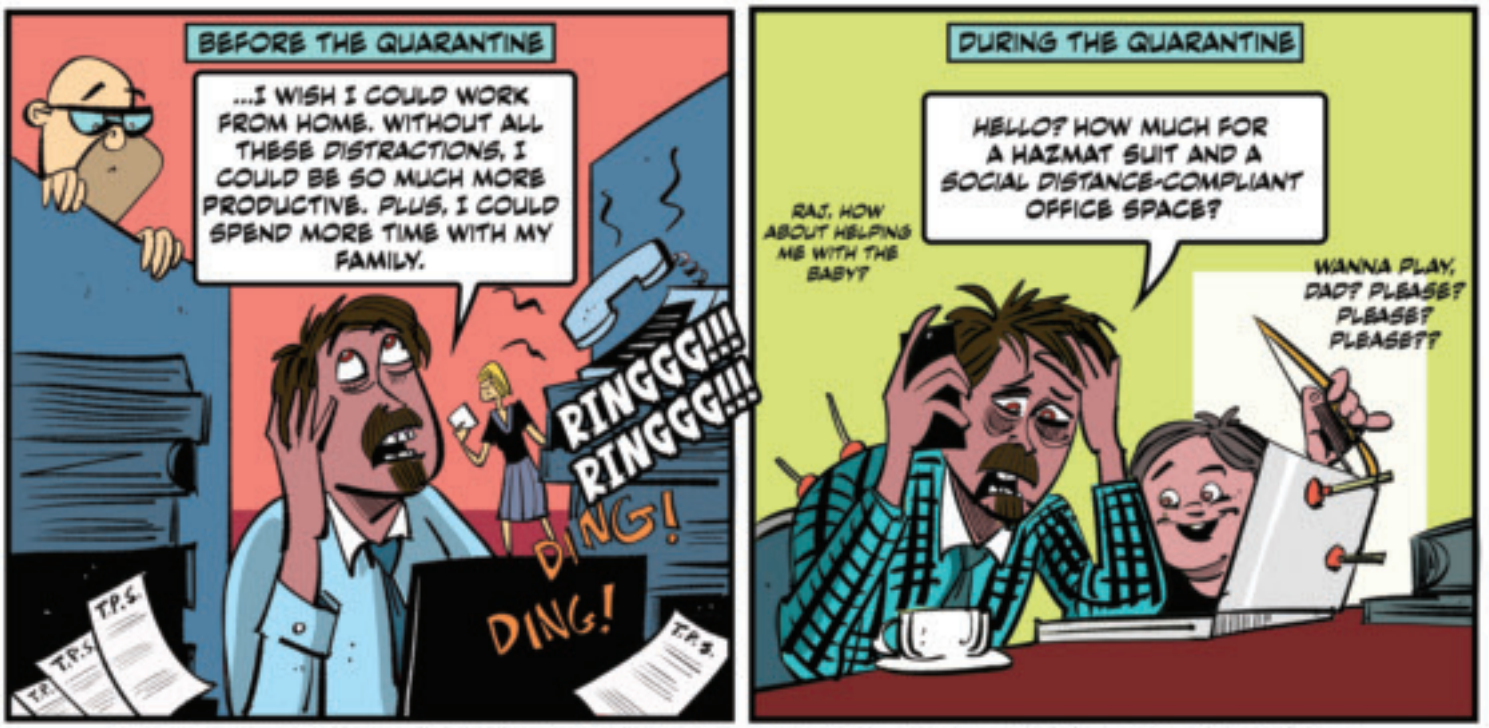
West Virginia Alpha

John F. Gardner, P.E., '75, recently joined the WVU-Statler College of Engineering Executive Advisory. John was founder & president of the global strategic accounts program at Emerson Electric's Automation Solutions, retired after nearly 37 years of service, and currently works as an independent consultant.

TRUE TALES from the TESTBENCH...

Fellow engineers: the story you are about to read is *true*. Only the *names* have been changed to protect the guilty.

Words / Art: Krishna M. Sadasivam
krishnadraws.com



Have a true, humorous tale from your engineering experience that you'd like to see in a future TTRT comic? Send your submission for consideration to dylan@tbp.org

Advertiser Index

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Tau Beta Pi

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DELL Technologies

Intel Xeon

Collegiate Chapters (256)

608,398

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.
AZ Δ	13	Embry-Riddle Aero. Univ., Prescott
AR A	9	Univ. of Arkansas
AR B	9	Univ. of Arkansas at Little Rock
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 Λ	15	Univ. of California, Davis
CA M	15	Calif. Poly. St. Univ., San Luis Obispo
CA N	16	California State Poly. Univ., Pomona
CA Ξ	16	San Diego State Univ.
CA O	16	Loyola Marymount Univ.
CA Π	16	Northrop Univ. (**inactive**)
CA P	15	California State Univ., Fresno
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 AΓ	15	San Francisco State Univ.
CA AΔ	15	Univ. of California, Santa Cruz
CA AE	16	Univ. of San Diego
CO A	12	Colorado School of Mines
CO B	12	Univ. of Colorado at Boulder
CO Γ	12	Univ. of Denver
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.
ID Δ	12	Brigham Young University-Idaho
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.
IN Z	8	Indiana Univ.-Purdue Univ. Indianapolis
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.
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 Λ	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
MO E	9	Saint Louis University
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.
NJ Z	2	The College of New Jersey
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 Ξ	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 Σ	2	Alfred Univ.
NY T	2	Binghamton University
NY Y	2	United States Military Academy
NC A	4	North Carolina State Univ.
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.
NC Z	4	East Carolina University
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 Λ	7	Youngstown State Univ.
OH M	7	Wright State Univ.
OH N	7	Cedarville Univ.
OH Ξ	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
OR Δ	14	Oregon Institute of Technology
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 Λ	3	Univ. of Pittsburgh
PA M	3	Penn State Erie, The Behrend College
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	10	Southern Methodist Univ.
TX K	10	Prairie View A & M Univ.
TX Λ	10	Texas A & M Univ.-Kingsville
TX M	10	Univ. of Texas at San Antonio
TX N	10	Univ. of Texas Rio Grande Valley
TX Ξ	10	Univ. of Texas at Dallas
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

Alumni Chapters (78)

• *denotes active chapter*

District 1
- *Central Connecticut, Hartford*
- *Greater Boston Area, MA*

District 2
- Buffalo, NY
- *Central Jersey, NJ*
- Long Island Suburban, NY
- Newark, NJ
- *New York City, NY*
- *New York Capital District, NY*
- *Rochester, NY*
- Southern Tier, Binghamton, NY

District 3
- Lehigh Valley, Bethlehem, PA
- Philadelphia, PA
- *Pittsburgh, PA*
- Wilmington, DE

District 4
- Baltimore, MD
- Hampton Roads, Newport News, VA
- Kanawha Valley, Charleston, WV
- *Research Triangle, Durham-Chapel Hill-Raleigh, NC*
- Richmond, VA
- *Washington, DC*

District 5
- *Atlanta, GA*
- *Central Florida, Orlando*
- Daytona Beach, FL
- Gainesville, FL
- Miami, FL
- Midlands, Columbia, SC
- *Palm Beach/Broward, FL*
- Piedmont, Clemson, SC
- Puerto Rico
- *Tampa Bay, FL*

District 6
- Bluegrass, Lexington-Frankfort, KY
- Central Alabama, Birmingham
- *Great Smoky Mountains, Knoxville-Oak Ridge, TN*
- Greater Gulf Coast, Mobile, AL
- *Louisville, KY*
- *Mid-South, Memphis, TN*
- *Rocket City, Huntsville, AL*

District 7
- *Ann Arbor Area, MI*
- Central Michigan, Lansing
- Cincinnati, OH
- Columbus, OH
- *Dayton, OH*
- Flint, MI
- *Ohio's North Coast, Cleveland*
- *Southeastern Michigan, Detroit*
- *West Michigan, Grand Rapids*

District 8
- *Chicago Area, IL*
- *Central Illinois, Urbana-Champaign*
- *Indianapolis, IN*
- *Milwaukee Area, WI*

District 9
- *Pioneer, OK*
- Rolla, MO
- *St. Louis, MO*

District 10
- *Central Texas (Austin/San Antonio)*
- *North Texas (Dallas-Fort Worth)*
- *Greater New Orleans, LA*
- *Texas Gulf Coast, Houston*

District 11
- Ames, IA
- *Minnesota, Twin Cities, MN*

District 12
- *Pikes Peak, CO*
- *Front Range, CO/WY*
- Salt Lake City, UT
- Treasure Valley, Boise, ID

District 13
- *Albuquerque, NM*
- *El Paso, TX*
- *Phoenix, AZ*
- Sun City, AZ
- *Tucson, AZ*

District 14
- Columbia River Basin, Richland, WA
- *Portland, OR*
- *Puget Sound, Seattle, WA*

District 15
- *Sacramento Valley, CA*
- *San Francisco Bay Area, CA*
- San Francisco Peninsula, Palo Alto, CA

District 16
- *Los Angeles, CA*
- *Orange County, CA*
- *Greater San Diego, CA*
- Southern California

Tau Beta Pi Convention

***October 22-24**
Atlanta, Georgia
Sheraton Atlanta Hotel
2020

RECRUIT the best and the brightest and **SPONSOR** activities at the annual **Tau Beta Pi Convention!**

As we go to press, Tau Beta Pi is moving forward with plans for an in-person Convention in Atlanta. However, circumstances may change and we hope to make a final decision by July 22 at the latest. If the in-person event is postponed or cancelled, we may plan a virtual career fair. Please check for updates at *www.tbp.org/covidNews.cfm

Recruiting Fair – Thursday, October 22

As a member, you know that Tau Bates are among the brightest and most talented engineers in the country. Your company will want a chance to hire more valuable employees like you!

Meet diverse candidates from 250 colleges and universities, most of whom hold leadership positions in their chapters.

Receive online access to the resumes of nearly 1,500 ΤΒΠ students from most engineering curricula and computer science.

Booth fees start at $750 for Tau Beta Pi's Recruiting Fair. Visit *www.tbp.org/conv/careerFair.cfm.*

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Through contacts by our member-employees, ΤΒΠ has formed relationships with companies like BAE Systems, FedEx, DeNovo, Power Costs, Inc., Sandia, Texas Instruments, and Torch Technologies, who saw the value in hiring fellow members. Contact Pat McDaniel at *pat@tbp.org* for more info.