In Memoriam: Professor Emeritus Arnie Fredrickson

CEMS lost a beloved alumnus, colleague and friend, Arnold “Arnie” Fredrickson (ChE '54, M.S. ’56), on November 27, 2017. Read these remembrances from Doraiswami (Ramki) Ramkrishna (Ph.D. ChE ’65).

Arnold “Arnie” Fredrickson was born in Faribault, Minnesota on April 11, 1932 and earned his Bachelor’s and Master's degrees in chemical engineering from the University of Minnesota. He obtained his Ph.D. in chemical engineering from the University of Wisconsin under the direction of Professor Robert Bird. Fredrickson worked as a Process Engineer at ADM, Co. in Minneapolis for one year before joining the CEMS faculty in 1958. He served on the CEMS faculty until his retirement in 2001.

With Arnie Fredrickson’s passing, Minnesota has lost an indomitable scholar who was as good a teacher as he was a researcher. As one of his early students (perhaps the second, the first being Rich Miller), it gives me great pleasure to reminisce about a person who was much more than an advisor. He was a friend always ready to pat

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CEMS graduate students claim top prizes in Dow SISCA competition

First and second place finishes for Connell, Voigt, and Walter.

A project by Ph.D. students Ryan Connell (materials science) and Samantha Hill (mechanical engineering) to advance low-cost solar concentrating windows won the 2017 Dow Sustainability Innovation Student Challenge Award (SISCA) $10,000 grand prize. Their invention uses novel materials and light-management techniques, to harvest solar energy on the entirety of a building’s exterior without sacrificing its aesthetics or functionality.

Connell and Hill point out that
MESSAGE FROM THE HEAD

ChE Hits 100 Years in 2019; MSE turns 50 in 2020

The CEMS Centennial & Jubilee will celebrate our history and define our path towards excellence for the next 100 years.

I am pleased to announce that in the academic year 2019-2020 CEMS will celebrate two major anniversaries – Chemical Engineering turns 100 years old in 2019, and Materials Science hits the 50 year mark in 2020. This combined Centennial and Jubilee is a tremendous opportunity for all of us to celebrate the distinguished history of the department, to recommit to the path of excellence, and to articulate our aspirations for the future. You, our alumni, nearly 7,000 strong, are our most important legacy, and we will be calling on you to participate and to support us as we commemorate this important occasion.

The origins of our chemical engineering program as a division of the School of Chemistry in 1919 certainly does not make us the oldest chemical engineering department in the country (e.g., Wisconsin and Delaware are a few years older), but beginning under the leadership of Neal Amundson in the 1950s and 60s, we clearly became a transformative force, and ever since, we continue to work at the forefront of the field. Materials science at Minnesota has its beginnings in metallurgy, a field that has deep roots in University of Minnesota history, stemming in large part from the economic impact of taconite mining in the “Iron Range” to the north. Morris E. Fine (Ph.D. ’43), the founder of the first materials science department at Northwestern University in 1958, in fact obtained his Ph.D. from our metallurgy program. There are many stories to recall and retell associated with the foundations of our current joint department, including stories about our numerous distinguished alumni, and I am extremely delighted that our very own Professor and President Emeritus Ken Keller has agreed to write a history of the department. Ken brings a knowledgeable and unique perspective to this project, having been hired by Amundson in 1964 and serving as President of the University from 1985-1988, and I can’t imagine a better person to document our history in a colorful and illuminating manner.

Planning for the Centennial & Jubilee Celebration is well underway, and we will communicate the full spectrum of our plans and activities in upcoming newsletters. Our CEMS External Advisory Board continues to be invaluable in these discussions, providing inspiration and creative ideas about how we best celebrate.
our legacy and look forward to the future. They will be reaching out to you, too, through this newsletter and social media, encouraging you to engage with us.

I’ll say this again. You, our alumni, are our greatest legacy. We are proud of you and look forward to welcoming many of you back to campus to help us celebrate these momentous birthdays.

C. Daniel Frisbie
Head, Department of Chemical Engineering and Materials Science

Save the Date!


Please update your contact information so we can keep you apprised of exciting developments. Email us at cemsalum@umn.edu

Kenneth H. Keller, Professor Emeritus and former President of the University of Minnesota (1985-1988), is currently researching and writing a book to commemorate the upcoming CEMS Centennial & Jubilee in 2019 and 2020.

Ken would like to request the help of CEMS alumni and friends to share photos or personal memories/stories that include CEMS faculty members and students. Informal, un-posed photos of faculty and students or photos from research labs are also requested.

When submitting photos, please identify everyone by name, if possible.

Please email your content and photos to cemsalum@umn.edu by June 1, 2018.
In preparation for the CEMS Centennial & Jubilee, Navjot Singh (Ph.D. ChE ’94) projects that fundamental strengths and future growth in key areas will launch CEMS into a new era of success.

It has been a tremendous pleasure serving as the Chair of the External Advisory Board of the Department of Chemical Engineering and Materials Science (CEMS) for the past two years. It is a true privilege to serve alongside many distinguished alumni and friends of the Department. We are thankful to the Department Head Professor Dan Frisbie for this opportunity and honor. It takes courage for a Department Head to invite a bunch of external advisors to seek their input with an open mind. Thank you, Dan!

As the External Advisory Board has spent time reconnecting with the Department, a few things have stood out for us. First, the quality of CEMS faculty members is truly distinctive. Core areas of expertise have been strengthened through innovative faculty research and many new research areas continue to emerge, which will become increasingly relevant in our economy. CEMS faculty members are also the recipients of many coveted awards and honors (including my favorite and former advisor Professor Frank Bates, who was recently elected to the National Academy of Sciences, in addition to his prior inductions into the National Academy of Engineering and American Academy of Arts and Sciences).

Second, the quality of both undergraduate and graduate students remains inspiring. As a Board, we have taken time to meet many CEMS students and listen to their feedback about the department. CEMS students are bright, passionate and eager to innovate. Approximately 80 percent of them are joining industry with the remaining 20 percent continuing their education in top departments around the country.

Third, the CEMS curriculum continues to be rigorous and prepares students for amazing depth and success in their future educational paths and careers. As a Board, we have also observed a few areas where CEMS could do a bit more and are collectively considering how CEMS can:

- Stay connected with our distinguished alumni and have them participate and shape the future of the Department
- Enhance the diversity of the department to be more inclusive and reflective of industry
- Attract additional capital to this famous department to enable the applied aspects and channel the genius of the faculty

On the horizon, my fellow board members and I will be considering what should be the next S-Curve for the Department e.g., entrepreneurship, interfaces with the Carlson School of Management, interfaces with computer science.

Together with the department, we are all proud of the progress we are making and have launched “action committees” focused on issues of pressing concern to CEMS. One action committee focused on partnering with alumni and the community has driven participation in the CEMS LinkedIn group and activated regional alumni groups in Minneapolis, Boston and soon in the Bay Area. Another action committee focused on increasing diversity has made some practical recommendations on ways to increase the number of women and
underrepresented students pursuing degrees in ChE and MSE. Our next action committee will focus on innovative ways to attract more capital to the department and support and grow the emerging culture of entrepreneurship in the department.

Finally, we will all be actively involved in planning for the 2019-2020 centennial and jubilee years of CEMS and hope that you will be as well.

And yes, we have some asks for you:

• Please join us as alumni champions as we prepare to launch the next century of leadership and excellence in CEMS.
• Attend events on campus or in your home city when possible.
• Serve as a mentor to our current students – this can be done remotely!
• Invite or host our faculty as speakers at your institutions or in your company.
• Consider a philanthropic investment in the primary asset of CEMS – its people, the students who are embarking on their careers much like you did, and the faculty who trained you and helped to launch your careers.

Feel free to write to any of us via the department, cemsalum@umn.edu, with your thoughts and ideas. Also, do tell us about your successes. We want to brag since we are all so proud of the vibrant community of alumni which we constitute!

By Navjot Singh, Ph.D. ChE ’94

Dr. Singh is Senior Partner with McKinsey & Company in Boston, Massachusetts.
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his students on the back whenever they did something of substance.

Arnie Fredrickson earned his Master’s degree in chemical engineering with Art Madden, and under advice from Neal Amundson, attended the University of Wisconsin-Madison to obtain his Ph.D. under the direction of Bob Bird. Arnie joined the faculty at Minnesota in 1958. By 1964, he had published his book, *Principles of Applications of Rheology*, with Prentice Hall. For the scholarly compilation it was, Arnie’s decision to move away from the field to seek greener pastures in modeling microbes came as a surprise to me. It is my belief that the presence of Henry Tsuchiya, who was my second advisor, had a lot to do with that decision. Rutherford (Gus) Aris added to the team with mathematical insight that was always special. The article by Tsuchiya, Fredrickson and Aris in Volume 6 of *Advances in Chemical Engineering* provides a flavor of the spirit that prevailed, one of perspective, depth and commitment to changing the field. It was, for me, an adventure ripe with excitement and free thinking, naturally interspersed with occasional arguments. One in particular that comes to mind was an issue of derivation which produced more head shakes than nods, but ended happily with a demand that I terminate my visit to India (which was to get married!) and return to resume work.

Although it was never unclear when Arnie liked to be left alone, I cannot ever recall a moment of conflict with him. He was always supportive, an attribute that can be found in the foreword he wrote for my book on *Population Balances*. Colleagues in academic departments where Arnie had delivered seminars would report back to me his commendatory reference to cybernetic models.

Arnie wrestled with fundamental issues in exacting detail, sometimes to his detriment on priority of publication. Our paper in the very first issue of *Mathematical Biosciences* in 1967 on the application of population balances to microbial populations was at least four years late in its publication. It did not concern him because he could tell no story until it was complete in all the respects with which he began its narration. This was a trait that followed him all along his academic life because his book on thermodynamics never got past the local printers in the department. Anyone who taught the recitations for his undergraduate course in Thermo will remember struggling with concepts such as availability! In this trait, he was very much in the category of Skip Scriven who was also never satisfied with any write-up.

Association with Arnie went well beyond the domain of academics. For example, Arnie and I went a couple of times to watch the Minnesota Twins during the days of Harmon Killebrew, Tony Oliva and Camilo Pascual. Arnie had a great sense of humor and liked to tell stories. Arnie had a red Jaguar that is rumored to have set some records of which local law enforcement was unaware, but reminding him of that period did lead to some self-admonition! This period was followed by one of steady decline in the quality of his four wheelers until its culmination into a Jeep, which was charged with carrying a heavy, pricey camera, especially on his tours for aerial exploration of birds. He would stop over at our home for the night on many of these trips, which also gave us an opportunity to go to dinner with him in a local Japanese restaurant. On one such visit, I am amused to recall that he had run out of gas on I-65 (fortunately only a few miles away from us), and I rushed to his rescue with enough gas to get him home. If I reminded him of it, he would quip back in return, “What about the time you locked yourself out from your car with the engine running?” This was right in front of his home!

Arnie took exceptional pictures of trumpeter swans, and my wife, Geetha, and I loved to hear of his insight into their behavior. He had expressed a desire to compile his discoveries into a book which unfortunately did not happen.

No reminiscence of Arnie would be complete without mention of his lifelong friend Dorothy, who has been
especially dear to me and my wife. I recall Arnie chiding me in good humor not to spend as much time in the Biomedical Library where Dorothy was a Librarian because she was his girlfriend!

Arnie’s passing has left us sad in his remembrance, but all that he has given us will sustain us in what is left.

By Doraiswami (Ramki) Ramkrishna, Ph.D. ChE ’65

Dr. Ramkrishna is the Harry Creighton Peffer Distinguished Professor of Chemical Engineering in the Davidson School of Chemical Engineering at Purdue University.

Alumni Remembrances

Eugene Brumm (ChE ’65)

I had a NSF Research Grant to study “Stress Relaxing in Non-newtonian Viscoelastic Fluids” with Arnie in 1965 while working on my BChE degree. He had a profound effect on my career as a chemical engineer.

William Hansen (ChE ’75)

I had the pleasure of taking several chemical engineering courses from Professor Fredrickson in the early 1970s; I graduated in 1975. I always found him to be a very good no nonsense instructor - who cared about his students. I’ll always have good memories of Arnie, and I send my deepest sympathy to his family.

Dave Starz (ChE ’75)

Arnie was my advisor from 1971-1975, and was extremely helpful in guiding my undergrad choices to complete my BChE in four years. I know that I disappointed him by not staying for a Master’s program, but the debts were too concerning. He was very interested in the limestone caves in Southeast Minnesota, where I grew up, and enjoyed talking about what he had seen in those caves. May he rest in peace.

Kate Shields (ChE ’88)

I went back to school for my BChE while working full-time. It took me almost nine years to finish it, 1-2 classes at a time. Arnie was my advisor, though we rarely met—and then only when I puffed my way up to his office on the 4th floor to get something signed.

When we met, he mainly discussed my previous degrees and his friend who was a librarian. I don’t remember any technical talk. We probably spoke less than a half hour over the course of my degree.

Later, I had to contest the computer class requirement. I had taken the required FORTRAN class, but didn’t complete my degree before another class was required. So, up I went to fourth floor. Arnie gave me seconds to explain, then said the change didn’t affect me. Done!

When I completed the necessary paperwork to graduate, I attached many other forms that Arnie needed to sign off on as my advisor, including the use of my Library classes as a minor. I heard that the office had never seen so many substitutions attached to the graduation form!

I never had a chance to really talk to Arnie, though I heard stories about his brilliance when I was an undergraduate student. Too bad!

CEMS Fredrickson Funds

Please consider making a gift to these funds in Arnie’s honor:

Arnie Fredrickson Fellowship Fund

This fund was established by Arnie’s former students and friends to support first-year graduate students.

Fredrickson Symposium Fund

This fund was established to honor Arnie upon his retirement and foster broader intellectual interaction between undergraduate and graduate students in the department.

Give online and enter the fund name: z.umn.edu/cemsgift

To learn about additional giving opportunities, please contact Courtney Billing, senior development officer, at 612.626.9501 or cbilling@umn.edu
Expanding the faculty

CEMS welcomes new faculty members Nathan Mara and David Poerschke.

Nathan Mara

Associate Professor Nathan Mara comes to CEMS from the Center for Integrated Nanotechnologies (CINT) at Los Alamos National Laboratory (LANL). He was a co-director of the Institute for Materials Science at LANL, and Thrust Leader for the Nanoscale Electronics and Mechanics thrust at CINT. He earned his Ph.D. in materials science and engineering from the University of California, Davis.

His research spans the fundamental to applied, and consists of correlating how a material is synthesized, characterizing its resulting structure, and measuring and understanding the mechanical properties and performance of a bulk material. “The need for lightweight, strong, and tough materials spans any area where structural reliability is an issue. This includes the transportation, military, manufacturing, biomaterial, and energy sectors, where lightweighting of components can result in major energy savings, increased part lifetimes, and lower environmental impact. A single new discovery in materials science can translate to a disruptive technology that takes humanity to our next defining age,” said Mara.

Mara further explained that, “I focus on looking at deformation phenomena where unit processes on the atomic scale collectively dictate a mechanical response that can occur over meters. Most of this work is hands-on experimental in nature, but one of my favorite aspects is that I work closely with those in the modeling community to validate and guide new models for materials design. The field of structural materials is rich with opportunities, and my 12 years at a National Laboratory has taught me that effective collaborations can produce a product that is greater than the sum of its parts. Students in my laboratory stand to benefit from such an atmosphere, where they will be afforded the opportunity to follow their research interests deep into a subject, while collaborating with others to fully address the broad implications of their findings.”

Mara is eager to conduct research at the University of Minnesota, which will provide a contrast to his prior career experience. “The University of Minnesota (UMN) is located in a major metropolitan area with leading companies that develop materials for biomedical, energy and electronic applications as well as research manufacturing approaches and mechanical test methodologies. Industrial challenges provide unique problems to address in new materials systems, and collaborating with industry represents an exciting part of being on the UMN faculty.

My research requires four main components: state-of-the-art synthesis capabilities, characterization facilities, multi-
scale mechanical property measurement capabilities, and a community of collaborators that specialize in materials modeling across length and time scales. As an academic institution, UMN possesses all four components in one place. The CEMS department provides an environment where this collaborative spirit is encouraged, and I look forward to working with my new students and colleagues,” said Mara.

David Poerschke

Assistant Professor David Poerschke joined the faculty in fall 2017. He earned his Ph.D. in materials from the University of California, Santa Barbara, where he continued as a postdoctoral scholar. Poerschke's research seeks to understand the evolution of materials in complex chemical, thermal, and mechanical environments. Combining experimental observations with theoretical models, he develops design-performance frameworks to accelerate the development of new materials offering improved performance. His past efforts have led to the development of improved ceramic coatings for use in jet engines and provided new understanding of the life-limiting oxidation processes in ceramic composites for turbine engine and hypersonic vehicle applications. "Driven by a desire to improve global connectivity while reducing the consumption of fossil fuels, the robust new materials developed by my research enable new transportation technologies while improving the efficiency of the energy technologies that currently serve as the basis for our economy,” said Poerschke.

Poerschke's research spans numerous aspects of materials engineering, including synthesis, processing and characterization, which makes it rather unique. Poerschke explained that, "I carried out my undergraduate and M.S. research in a metal processing laboratory, developing improved methods for casting high strength aluminum and magnesium alloys desired for vehicle light-weighting, and processes for forming creep-resistant molybdenum alloys. I then shifted to focus on structural ceramic composites and coatings for my Ph.D. and postdoctoral training. This breadth of experience makes me uniquely suited to carry out a research program seeking to integrate multiple classes of materials into high-performance systems. My research takes on a holistic approach, beginning with the synthesis of the constituent materials followed by the processing of composite architectures, testing in complex environments, and finally characterization using tools that span many length scales.

Poerschke is poised to have a promising career in CEMS and is energized by the collaborative, interdisciplinary work occurring here. “By bringing together scientists with interests spanning across chemical engineering and materials science under one roof, CEMS at UMN provides a unique environment for cutting-edge science at the convergence of these disciplines. In combination with the caliber of the students and access to world-class electron microscopy, X-ray diffraction, and surface analysis instruments in the CharFac, CEMS is well-positioned to enable future breakthroughs. I’m proud to be part of the CEMS faculty who collectively demonstrate serious commitments to research and teaching, while also striving to foster an inclusive and collegial atmosphere of learning and discovery,” said Poerschke.
In continuation of its drive towards diversity and inclusion, AIChE presented a series on LGBTQ engineers and featured Professor Alon McCormick on its blog, “ChEnected.” Other related AIChE efforts include Safe Zone Workshops and leadership receptions for LGBTQ members and allies. All aforementioned initiatives are supported by the AIChE Foundation’s “Doing a World of Good” campaign. AIChE will also launch a LGBTQ+ & Allies Online Community in mid-February 2018, open to professional AIChE members who are LGBTQ+ and allies. The following are excerpts from the AIChE feature:

**What about your AIChE life would help people get to know you?**

Throughout my career teaching at the University of Minnesota, I’ve had the opportunity to serve in various roles in AIChE. Years ago, I served mainly in the Materials Engineering and Sciences Division (MESD) and on the Program Committee. In recent years I’ve served on the Chemical Engineering Technology Operating Council (CTOC), on the Executive Board of the Program Committee, on the Education and Accreditation Committee, and as liaison from CTOC both to the International Committee and to the Societal Impact Operating Council (SIOC). I’ve also had the chance in recent years to participate in diversity and inclusion efforts. I was honored to join a SIOC Diversity and Inclusion Task Force convened by Zenaida Otero Gephardt in 2014, and that led to my assisting efforts in AIChE to address LGBTQ+ inclusion. The following year I also got to participate in a project led by Stephanie Farrell in the American Society for Engineering Education, and funded by the National Science Foundation, to promote ally training for the benefit of LGBTQ+ students.

**Tell us about your experience as an out LGBTQ+ professional working in chemical engineering**

Since my teaching career started in the late 1980s, there has been a lot of progress in the climate for LGBTQ+ chemical engineers. Back then (and of course much more so earlier), in many environments both LGBTQ+ and ally engineers experienced or witnessed discrimination much more frequently than today. We worked in a professional climate that was often not accepting, and sometimes not even tolerant. Compared to today, it was much more common for many LGBTQ+ engineers to encounter overt scorn or derision. What faced us at the time was the need to build a climate of improved tolerance and freedom from discrimination.

The guidance that I got then—from mentors, from family, and from the few LGBTQ+ role models I found in science and engineering—was to concentrate on building good professional relations and reputation, hoping to educate...
peers about the value of LGBTQ+ people in engineering through these relationships. Even some of the more tolerant among my peers and senior colleagues, though, struggled with negative stereotypes, and they typically expected me to remain private about my own family life, conforming to a “don’t ask, don’t tell” climate. That advice may have been pragmatic for the reality of that era; indeed, I think we lost a lot of talent in science and engineering as LGBTQ+ people avoided, left, or were pushed out of the hostile environments more common back then.

So, in my early career, I tried not only to foster good working relationships, but also to cultivate allies, help counter bias where and when I could, and work with committees at the campus and community level toward more equality and for LGBTQ+ student support. While the overall climate of the particular science and engineering environments I worked in were often largely tolerant, at that time it was not uniformly accepting. There were certainly occasions when I experienced or witnessed marginalizing behavior from peers, senior colleagues, and even from students.

For example, after confronting bias or creating awareness for LGBTQ+ causes, I was sometimes perceived as being too “out” and met with disapproval from individuals who felt I wasn’t “covering” my identity sufficiently to conform to then-current expectations.

In my own department and university community in Minnesota, and in my particular technical community (especially, then, in MESD), I was fortunate to find many colleagues who were professional and at least tolerant. I’m sure this tolerance was thanks, in part, to good will created previously by strong working relationships with diverse colleagues and to the growing general appreciation at the time for equality. There was growing awareness of the value of inclusion catalyzed by the work of AIChE’s Minority Affairs Committee (MAC) and Women’s Initiatives Committee (WIC) and other groups. I’m particularly grateful for the efforts of allies in those times. Though perhaps fewer and quieter than we enjoy now, they showed courage in helping to educate the professional and academic community about the value of being accepting of all colleagues’ contributions. I’m sure these allies’ supportive voices advocated for me behind the scenes when I was not even aware of their help, and I wish that all LGBTQ+ engineers could have had such support back then.

What are the most important issues that LGBTQ engineers deal with in the workplace today?

Now, decades later, there are many more LGBTQ+ scientists and engineers who are able to be themselves, open in varying degrees throughout their careers. Their working relationships have helped the professional community gain much more experience working with and valuing peers who are diverse. We also benefit, of course, from much more education in our society, and with that education much more visibility and influence of allies.

Many more young engineers now rightly expect to work in a climate that is more accepting and inclusive, not merely tolerant, of LGBTQ+ contributors. Many companies and organizations now recognize that a more inclusive climate is good for business, for recruiting, for the profession, and for society. Marginalization, discrimination, and disrespect are now recognized as both personally unprofessional and bad for the profession. LGBTQ+ and ally engineers are much better prepared to effectively address negative bias and promote professional working relationships. Allies are more willing to speak up to educate peers and articulate the value of an inclusive workplace.

There are still challenges. There is ample evidence that in some environments LGBTQ+ scientists and engineers still have trouble finding acceptance or even tolerance. A recent study in the American Physical Society (available at http://www.aps.org/programs/lgbt/) shows current critical issues reported by LGBTQ+ physicists; for example, they “have faced uneven protection and support from legislation and policies” and “reported trouble identifying allies to help mitigate isolation, exclusion, or marginalization.” They find still that in many environments, “social norms establish expectations of closeted behavior.” Physicists “with additional marginalized identities faced greater levels of discrimination” and “transgender and gender-nonconforming physicists encountered the most hostile environments.” (Full citation: Timothy J. Atherton, Ramon S. Barthelemy, Wouter Deconinck, Michael L. Falk, Savannah Garmon, Elena Long, Monica Plisch, Elizabeth H. Simmons, Kyle Reeves. LGBT Climate in Physics: Building an Inclusive Community (American Physical Society, College Park, MD, 2016).

Though we have not yet had the opportunity to do such a study in chemical engineering, I think we would find similar concerns. What can AIChE do to help ensure that all chemical engineers have the opportunity to contribute their talents?

Read the complete feature: z.umn.edu/aichefeature
Remarkable career

CEMS Professor Chris Macosko retires after 48 years of service.

Professor Chris Macosko retired from his faculty position in January 2018 after 48 years of service in CEMS. Although Macosko became a professor emeritus in January, he remains active in research and occasional teaching.

Macosko is an award-winning materials processing and polymer scientist. His research efforts include developing and testing models for processes that involve network polymerization (such as electronics encapsulation), nanoparticle reinforced polymer composites, interfacial reaction during polymer blending, and polymerization with phase separation (for example, formation of polyurethane block copolymers during reactive foaming).

Macosko memories

Rafael Camargo (Ph.D. ChE ’84)
To share my memories of Chris is to share 40 years of a mentor, a true friend and a colleague. I have been fortunate through my work to stay connected with Chris and work on some research projects together, but what I really value is the friendship, not just of him but also from his wife, Kathleen. Chris and his family always had their door open to many of us. Just recently we had a great time having dinner at his house and then going to a Gophers football game to which he gracefully invited me, my wife and one of our sons. Chris has really been part of our lives since we came to the United States.

Gibson Batch (Ph.D. ChE ’89)
Memories of Chris Macosko - that is easy. I hear his enthusiastic voice almost every day. I learned from Chris the importance of hard work (no one worked harder than Chris), the necessity of family connections, and that students are the number one ‘product’ of the University of Minnesota.

I don’t think I am alone in saying that I view Chris as a surrogate father, picking me up when times are tough for me. He has done that several times during and after my time at the “U.”

And then there are memories of the fun things we did. I recall dozens of meetings with him and his students at conferences, dinners together, and invitations to spend time with current students at outings closer to home. Chris has always welcomed…

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Faculty awards

Frank Bates, Chris Macosko

The American Association for the Advancement of Science (AAAS) Board of Directors awarded the 2017 Newcomb Cleveland Prize to James M. Eagan, Jun Xu (CEMS Ph.D. student), Rocco Di Girolamo, Christopher M. Thurber (Ph.D. ChE '15), Christopher W. Macosko, Anne M. LaPointe, Frank S. Bates, and Geoffrey W. Coates for their outstanding report “Combining polyethylene and polypropylene: Enhanced performance with PE/iPP multiblock polymers,” published in Science 24 February 2017. The work was supported by the Center for Sustainable Polymers (CSP), an NSF sponsored program.

Every year hundreds of ground-breaking research papers are published in the journal Science, but only one is selected for the prestigious Newcomb Cleveland Prize, AAAS’ oldest award. The best paper is chosen based on the quality of the scholarship, innovation, presentation, likelihood of influencing the field, and wider interdisciplinary significance. This award was presented at the AAAS Annual Meeting in Austin, Texas on February 15, 2018.

David Flannigan

Assistant Professor David Flannigan has been selected by the College of Science and Engineering (CSE) Promotion and Tenure Advisory Committee to receive the George Taylor Career Development Award. The award recognizes exceptional contributions to teaching by a candidate for tenure during the probationary period. Faculty are considered for the award at the time they are being evaluated for the granting of permanent tenure and promotion to the rank of associate professor. Flannigan will receive a monetary award to use on professional development in teaching and research. He will also be honored at the CSE pre-commencement celebration on May 11, 2018.

Timothy Lodge

Regents Professor Timothy Lodge was selected to receive the 2018 Paul J. Flory Polymer Education Award from the American Chemical Society (ACS) Division of Polymer Chemistry, honored for his outstanding achievements in promoting undergraduate and graduate polymer education. He will receive this award at the ACS National Meeting in New Orleans in March 2018, and will participate in a half-day symposium. Lodge holds appointments in both CEMS and Chemistry.

Macosko continued from page 12

me and made me feel important - he did this equally well to everyone.

What a wonderful role model he is for me as I branch out into the world. Kathleen was a huge contributor to Chris's success, and I have always been awed by their relationship.

In 1984 I had to decide which Ph.D. advisor to choose from a long list of incredible faculty. I like to think I selected the best one for me. Godspeed, Chris. We love you! Enjoy your years ahead, and I hope you can stop working so hard.

Jeff Ting (Ph.D. ChE ’16)

What I will always remember most about Prof. Macosko is his remarkable ability to make scientific phenomena relatable to everyday applications. This was true in not only the graduate Rheology and Colloids classes I took under him, but also in his involvement, leadership, and support of the annual MRSEC-supported Polymer Day outreach event for high school students. It is difficult for me to describe how proud I am to have collaborated with Prof. Macosko, alongside my graduate school friends and our advisors, for a special article in the Journal of Chemical Education this year. Thank you Prof. Macosko for the great memories!

Share your memories of Chris Macosko with us via email: cemsalum@umn.edu
Emerging leaders

CEMS undergraduate students hone their skills with leadership positions in student organizations.

The four short years that constitute a typical undergraduate experience seem brief when recognizing all of the personal and professional development that must occur before one is launched into the “real world.” However, becoming involved in student organizations provides an excellent opportunity to cultivate relationships, pursue a variety of interests, and acquire skills necessary for future careers. A select group of CEMS undergraduates are further defining their character by holding leadership roles in student groups.

AIChE

Sihoon Moon (ChE ’19) serves as President of the American Institute of Chemical Engineers (AIChE) student chapter at the University of Minnesota. The campus chapter connects CEMS students with the larger AIChE community (50,000 members from over 100 countries) and each other by hosting monthly social and professional development events, organizing campus visits from industry professionals, and participating in conferences and outreach.

During fall semester, the AIChE chapter participated in the AIChE & Material Advantage (MA) Kickoff with General Mills, Open House and Career Development Workshop with MA and ExxonMobil, and held various student panels that addressed research, internships, and graduate school.

Moon remarked, “In addition to providing CEMS students with networking and professional development opportunities, AIChE is a great way to participate in peer mentorship. Older students can reflect on and communicate what they have learned as chemical engineering majors. This not only helps younger students navigate their coursework and internship search process, but also helps older students prepare for similar questions during interviews and on graduate school applications. As a junior, hearing freshmen and sophomores describe their motivations for studying chemical engineering reminded me why I originally chose to major in chemical engineering.”

The importance of peer mentoring and relationship building motivated Moon to seek a leadership role in AIChE. “As an AIChE board member, I’ve come to appreciate how important good organization and time management skills are. To effectively connect our peers and strengthen a sense of community, we needed to consider everything from the smallest details to the big picture and fit them all together when planning our events. It’s the kind of thing you need a team of dedicated, organized, and reliable people to do. The fellow board members that I have met over the years have served as great role models to me,” said Moon.

GOFIRST Robotics

Elise Lohmann (ChE ’19) has been a member of GOFIRST Robotics since her freshman year, and now serves as President. This student group provides opportunities for College of Science and Engineering (CSE) students to apply concepts learned in the classroom to hands-on robotics projects, while also serving the broader community through outreach events in order to inspire the next generation of STEM students.
Lohmann enjoys that the group offers a variety of applied learning opportunities. “This student group has given me the chance to work on a variety of projects including Robot in 3 Days, where we design, prototype, and build a robot from start to finish in just 72 hours and other competitive projects like the Autonomous Snowplow and NASA Mining Competition. Aside from our own projects, we work with local groups like the Boy Scouts and high school robotics teams to build interest in STEM and mentor them by assisting with their projects.

Additionally, we hold networking events on campus where we bring in a variety of professionals to speak about their work in industry and research. GOFIRST offers CSE students a place to socialize with other students with shared interests while practicing technical concepts we learn in the classroom on a variety of full-scale projects,” said Lohmann.

**Material Advantage**

After joining the Material Advantage student group as a sophomore, Lindsey Borgeson (MSE ’18) now serves as President. “Participating in the group has been incredibly helpful in shaping my ideal career path with materials science. Seeing the passion for materials science in both researchers and industry professionals really motivated me to dive into all that materials science has to offer. Being able to help coordinate events that spark similar passions in other students is what drew me to being an officer, and it’s been a really rewarding experience,” said Borgeson.

The group offers insight into what materials science engineering is as a major and career path. The group participates in outreach events and invites academic faculty as well as industry professionals to discuss career options for materials scientists and engineers.

During fall semester, Material Advantage members participated in the 3M Super Science Saturday outreach event, began a special Delta Print project with Professor Lorraine Francis, and conducted outreach at Bluff Creek Elementary School.

During general meetings, MA members learned about medical devices from CEMS alumnus Nick Stepka (MSE ’14) from Medtronic, Inc., and failure analysis from Les Engel, founder of Engel Metallurgical.

“Material Advantage has enhanced my college experience significantly. It has allowed me to form friendships beyond the classroom setting – I’ve become close with other members that I would have otherwise not known as well. It has given me the opportunity to participate in outreach events where I was able to reach out to a younger generation and encourage the pursuit of STEM careers, which I hope will impact society for the better. Perhaps most importantly, however, it’s given me great insight into the kind of career I would like to create for myself,” said Borgeson.

**National Society of Black Engineers**

Giselle Beebe (MSE ’19) wanted to become President of the National Society of Black Engineers (NSBE) because she is “passionate about changing the way black people, even from a young age, view STEM fields.”

Beebe continued, “There is a large deficit in the numbers of black students interested in STEM because at such a young age they are already being told they are incapable. It is my job to be an example of a successful student who is working towards a STEM career and show them that it is possible.”

The National Society of Black Engineers (NSBE) is a national student organization that works to “increase the number of culturally responsible black engineers who excel academically, succeed professionally and positively impact the community.” The student group seeks to provide internship/job opportunities, professional development skills and tools for successfully tackling engineering curriculum for all members. It is also a supportive community for black students in engineering to collaborate and share in each other’s experiences.

Beebe credits her participation in NSBE for developing her leadership and outreach skills. “I am able to interact with

*continued on page 21*
GIVING MATTERS

Driven campaign aligns with CEMS Centennial & Jubilee

Help us advance chemical engineering and materials science education for the next 100 years.

2019, the 100th birthday of Chemical Engineering, and 2020, the 50th birthday of Materials Science, provide an opportunity for CEMS to reflect gratefully on the department’s remarkable network of donors, alumni, and friends. Your generosity ignites innovative faculty and student research, provides resources necessary to maintaining our competitive edge, and helps CEMS attract and retain world-class minds.

With the Centennial and Jubilee celebrations on the horizon, and as part of Driven: the Campaign for the College of Science and Engineering, we invite you to join us in investing in the future of chemical engineering and materials science. Specifically, we seek to maintain our excellence and expand the scope and impact of our work by securing funding for the following priorities:

- Enhanced and sustained funding to support lab and learning spaces that bring students and faculty together outside of the classroom to maximize hands-on, applied learning opportunities and encourage collaborative, interdisciplinary problem solving; and
- Funding for student enrichment programming such as seminars, lecture series, and industrial networking opportunities.

To those who have generously contributed in the past, thank you for investing in our excellence and our future. We invite all of you – our alumni, friends, volunteers, and supporters – to consider a new or renewed investment in CEMS as we approach our Centennial year in 2019-2020. Together, we will drive discoveries for the next century and beyond.

To learn more about ways you can make a meaningful difference in the life and work of CEMS, please contact Courtney Billing, senior development officer, at 612.626.9501 or cbilling@umn.edu

Class of 1968: Mark your calendars!

CSE 50-Year Reunion
Thursday, May 10 (all day)
Friday, May 11 (evening only)
U of M east bank campus (various locations)

Catch up with classmates, reconnect with faculty, and take a look ahead—at new initiatives, innovative research, and the students of today as they become the leaders of tomorrow.

The 50-Year Reunion honors University of Minnesota College of Science and Engineering (formerly the Institute of Technology) alumni who have reached the 50th anniversary of their graduation. During the festivities, you will be inducted into the College of Science and Engineering Golden Medallion Society and receive a commemorative medallion. In addition, the Class of 1968 will lead the 2018 commencement procession.

All events are complimentary for you and a guest, but require pre-registration.

Visit https://cse.umn.edu/r/cse-50-year-reunion/ to learn more!
CEMS is delighted to announce two new funds which will honor, sustain, and advance the department’s strong tradition of excellence in catalysis and reaction engineering.

Stemming from the dedication of Professor Raul Caretta and Regents Professor Emeritus Lanny Schmidt and drawing upon resources which both faculty members helped to attract to the department, CEMS has established a new graduate fellowship and professorship named after these current and emeritus faculty members.

The **Raul and Diana Caretta Graduate Student Fellowship** will provide necessary funding to chemical engineering and materials science graduate students. This endowed fellowship will be awarded annually based on achievements of academic merit. Caretta, a devoted educator and alumnus of the department, earned his Ph.D. in chemical engineering under the guidance of Professor Schmidt in 1979. He has taught the Unit Operations course for more than 25 years and mentored countless undergraduates as they have passed through this vital lab. This new graduate fellowship is a fitting complement to the department’s Raul Caretta Scholarship, established in 2013.

The **Lanny and Charlotte Schmidt Professorship in Catalysis and Reaction Engineering** will support a faculty member working in the research area most closely aligned with Professor Schmidt’s distinguished legacy. Schmidt served on the CEMS faculty for 49 years (1965-2014). He published over 350 papers in refereed journals and supervised approximately 90 Ph.D. theses, and 15 M.S. theses over the span of his academic career. As a beloved instructor and advisor, Schmidt and his wife, Charlotte, along with his student Duane Goetsch and his wife, Nancy Dickerson, established their named CEMS fellowship in 2003.

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The importance of endowed faculty positions in the form of named professorships and chairs is a leading priority for CEMS. The resources provided by the Schmidt Professorship will aid CEMS in recruiting and retaining field-shaping faculty by providing start-up funds, supporting graduate students, and outfitting research labs.

Alumni and friends are invited to consider a gift or pledge to the Schmidt Professorship to help it grow over time. Once a total of $2 million in philanthropic commitments to the fund has been secured, it will convert into an endowed chair, which honors and recognizes the distinction of superior faculty while providing invaluable financial support for use in research, teaching, and service activities.

Every gift, no matter the size, makes a difference in advancing the teaching and research mission of CEMS. To learn how you can contribute to these funds, please contact Courtney Billing in external relations at cbilling@umn.edu or 612.626.9501.
Connected through chemical engineering

William L. Liike, an alumnus of the University of Iowa chemical engineering program, will support CEMS through a remarkable philanthropic gift.

William L. Liike, a 1955 graduate of the University of Iowa’s chemical engineering program, has called St. Paul home for more than 30 years, during which time he has admired the University of Minnesota and the talented faculty and students within its College of Science and Engineering.

His tradition of giving back has made a tremendous impact at his alma mater, where Bill has established the William Liike Engineering Scholarship and provided a gift to name a laboratory in honor of the late former department head, professor, and personal mentor, Karl Kammermeyer.

In 2017, Bill expanded his giving to include a generous future gift commitment in support of CEMS. As an unrestricted gift, Bill’s philanthropy will empower the department head to seize emerging opportunities and address pressing needs.

Following his graduation from the University of Iowa, Bill joined E.I. du Pont de Nemours and Company in Saint Paul, Minnesota, where he worked for 30 years in sales and technical assignments. Since his retirement in 2007, Bill has continued his dedicated service as an elder at St. Paul’s House of Hope Presbyterian Church and served as a campaign volunteer at the University of Iowa.

Bill hopes that his commitment will inspire others to invest in promising and hardworking engineering students and the faculty who work to prepare them for a meaningful future.

Reunion visit inspires new scholarship

Joseph Matula (ChE ’67) has created the Joseph P. Matula Endowed Scholarship in Chemical Engineering.

Matula received his BChE from the University of Minnesota in 1967 and a Master’s degree in chemical engineering from the University of Illinois in 1969. He had a successful 45 year career with ExxonMobil, which he believes is attributable to the strong educational background that he obtained.

Following a return to campus for his 50th class reunion in 2017, Matula was inspired to establish this new undergraduate scholarship because of his strong belief that qualified students should have the opportunity to enroll in the chemical engineering program at the University of Minnesota.
Undergraduate scholarships

Nearly 60 deserving students were awarded scholarships in AY 2017-18.

American Institute of Chemical Engineers Scholarship
Tsvetelina Baryakova

Marvin and Christine Ballard Scholarship
Nicholas Gottfried

Frank and Janis Bates Scholarship
Utkarsh Koshti

Raul Caretta Scholarship
Lindsey Borgeson

George and Joan Carlson Scholarship
Claire Park

CEMS Scholarship Fund
Kyle Christopher, Haley Schibur

Tu and Pi-Fang Chen Scholarship
Katherine Gramling, Micah Howard, Mikayla Roth, Jose Santillan, Trevor Steiner

Bobbie Huston Cronquist Scholarship Fund
Kelsey Sather, Lucy Stephenson

Thomas W. Cummins Scholarship
Sei In Kim

Rosalie Sperling Dinkey Scholarship
Macallum Brabender

Harry Fischman Scholarship
Joshua Van Benschoten

John P. Fridley Scholarship Fund
Gage Badeau, William Broomhead, Marines Chinchilla, Crystal Dyer, Omar Hammami, Blake Johnson, Matthew Viesselman, Ryan Wong

Donald Leask Fuller Scholarship Fund
Hye Won Lee

Christie John Geankoplis Scholarship
Alexander Jones

General Mills Scholarship for Chemical Engineers
Clarissa Kraft

Genentech Scholarship
Malcolm Smith

Helvig Scholarship
Jinbin Chen, Eleanor Green, Dylan Loomis, Phuoc Nguyen, Karl Olson

Jerry and Leona Hillestad Scholarship
Matthew Lawless

Archie B. Japs Scholarship
My Nguyen

Kempf Scholarship Fund
Frederick Won

Kenneth V. Krake Scholarship Fund
Anatoly Kuznetsov

Vincent K. Leung Scholarship
Benjamin Nicholas

Charles A. Mann Award/Chemical Engineering (1934)
Haley Beech, Benjamin Henderson, Walter Young

Wendell and Dottie Manske Scholarship
Connor Holzhall

Joan Mattern Scholarship in CSE
Megan Cichos

Mendesh Family Scholarship
Konstantin Mamedov

Jim and Lorinda Mishek Scholarship
Michelle Bader, Sydney Jones

Athos J. Monti Scholarship
Nicholas Volkenant

Procter & Gamble Company Scholarship
Nurul Quratulaini Abd Salim Nast

Ed and Cora Remus Scholarship
William Merkl, Elizabeth Nessim

Jeffrey and Patricia Schott Scholarship
Matthew Folkert

Donald M. and Patricia R. Sullivan Scholarship
Justin Torres

Melvin Tobias Scholarship
Riley Juggle

James Stanley Vacek Memorial Scholarship
Travis Varpness

Raymond A. Voet Scholarship
Samuel Bryson

Barbara J. and David J. Yarusso Scholarship
Amelia Kirkhorn

Paula Zoromski Memorial Scholarship
Navya Prabhusankar

Please consider supporting CEMS and its students:
1. Online: z.umn.edu/cemsgift
2. “Give to CEMS” button on CEMS website: cems.umn.edu
3. Contact Courtney Billing:
   612.626.9501 or cbilling@umn.edu
traditional photovoltaics, such as solar panels, don’t lend themselves to applications when it is important that the building look a certain way. “As a result, most of the building surfaces in our cities that could be used for solar energy harvesting, such as windows, remain unused,” the students said in their presentation.

Luminescent solar concentrators (LSCs) are a potential solution. Made of transparent plastic sheets doped, or intentionally contaminated, with photoluminescent material, LSCs concentrate sunlight and convert it into energy. But thus far, inefficient design and a lack of suitable photoluminescent materials have prevented commercialization of the technology. Employing silicon nanocrystals, Connell and Hill developed an efficient, non-toxic, large-area and semi-transparent LSC. Silicon, they note, is the second most abundant element on Earth. It’s both low-cost and environmentally friendly. In their work, the partners were able to demonstrate the feasibility of dispersing the silicon nanocrystals in polymers, for ease of fabrication, and predict a five-times concentration of light onto solar cells.

“We’re grateful for the opportunity the Institute on the Environment provided to share our work to create solar energy harvesting building materials and the support to bring it into a commercial space,” said Connell and Hill. They also expressed gratitude to their mentors and advisors, chemical engineering and materials science assistant professor Vivian Ferry, mechanical engineering professor Uwe Kortshagen, and chemistry professor Marc Hillmyer, as well as their respective groups for their feedback and guidance.

The competition runners-up, materials science Ph.D. students Bryan Voigt and Jeff Walter, also presented work to advance solar energy and received a $2,500 prize. They are working to resolve challenges impeding the use of low-cost, Earth-abundant pyrite FeS$_2$ as a solar cell material.

The research partners solved a long-standing doping puzzle in FeS$_2$, as well as developed a model to describe its diverse surface properties, among other advances. Their research paves the way for large-scale, sustainable FeS$_2$ solar cells.

CSE chemical engineering and materials science professors Chris Leighton and Eray Aydil served as advisors.

“We’re very proud of all of these students,” Aydil said. “They gave terrific presentations on first-rate scientific work while looking like seasoned entrepreneurs.”

The Dow SISCA competition is made possible by a collaboration between the Institute on the Environment and the Dow Chemical Company.

Excerpts from a news release written by Rhonda Zurn, College of Science and Engineering, and Lacey Nygard, University News Service.
Leaders continued from page 15

12 other students across engineering disciplines on my board that I may not have met otherwise. I am able to foster the community for the board and our general membership on campus. I am also able to use my voice and leadership role to help young people envision endless possibilities for their futures,” said Beebe.

Beebe would encourage other undergraduates to consider joining NSBE for its supportive network. “At the end of the day, we are a family. We want students to have a place where they feel welcome and can be heard. We want our members to have the best support possible and know they do not have to go through anything alone.”

The NSBE will continue to host informative workshop sessions with corporate representatives and increase outreach efforts at local Boys and Girls Club locations. The group also hopes to continue strengthening their relationship with the NSBE Twins Cities Professionals and even NSBE chapters throughout the state of Minnesota.

Tesla Works

Tesla Works provides a framework for students to propose innovative project ideas, then connects them with the resources and member base to bring those projects to fruition. This student group currently has 20 active projects, ranging from liquid-powered rocket engines to a remote-controlled coffee pot and a high-altitude weather balloon. Each project is driven by an interdisciplinary team of students. The group also conducts outreach events by participating in the College of Science and Engineering (CSE) Expo or Minnesota State Fair. Tesla Works also produces the CSE Winter Light Show, with more than 100,000 LED lights sequenced to music in a series of half-hour shows for the general public occurring each December.

Leyla Soykan (ChE ’18) joined Tesla Works during her freshman year because she saw a group making “some really cool stuff, and I wanted to be a part of it.” Soykan is now the President of Tesla Works, having previously served as Outreach Coordinator. “Working on Tesla Works projects has been a great opportunity to interact with students who have different skills outside of my major. I’m a chemical engineer, but through Tesla Works I’ve learned to solder, make robust drive trains, and taught computer scientists and biologists various bits of chemistry or thermodynamics. During my internship last summer, it was a tremendous advantage to be able to understand and communicate about the mechanical or electrical aspects of the equipment that I was working on. Our Tesla Works group boasts a culture of initiative, enthusiasm, and a willingness to try new things. By joining the group, students are given an opportunity to pursue topics that interest them through hands-on, collaborative projects, which prepares them for their future careers,” said Soykan.
Robert A. Brown (Ph.D. ChE ’79), President of Boston University, is an exceptional scholar and committed academic leader.

Robert Brown (Ph.D. ChE ’79) was honored by the University of Minnesota Board of Regents with an Outstanding Achievement Award in November 2017 for his contributions as an international leader in computational modeling of crystal growth, an area of enormous commercial and strategic importance because of the central role of high purity semiconductor crystals in microelectronics. He is well-known for his pioneering work in the fields of viscoelastic fluid mechanics, applied mathematics, and advanced numerical simulation.

In addition, Brown served as Head of Chemical Engineering, Dean of Engineering, and then Provost of Massachusetts Institute of Technology (MIT). Since 2005, he has served as President of Boston University, a large private institution with over 32,000 students.

Brown completed his Ph.D. under the direction of the great “Skip” Scriven (1931-2007) working in the areas of fluid mechanics and mathematical modeling. Brown was an exceptional graduate student, and immediately upon graduation he began as an assistant professor of chemical engineering at MIT, where he quickly climbed the ranks to full Professor in just five years.

Brown is an elected member to the National Academy of Engineering (1991), American Academy of Arts and Sciences (1994), and National Academy of Sciences (2001). In 2008, he was honored as one of the “Top 100 Chemical Engineers of the Modern Era” by the American Institute of Chemical Engineers (AIChE).

He chairs the Academic Research Council of the Ministry of Education of the Republic of Singapore (2006-present), which is a key funding body for academic research in that country. In Singapore, he also serves on the Research Innovation and Enterprise Council, chaired by the Prime Minister. In recognition of his extraordinary contributions to higher education in Singapore, Brown was named an honorary citizen in January 2006. This award is the highest form of recognition given by the Singapore government to any non-Singaporean.

Brown serves on the board of E.I. du Pont de Nemours and Company (2007-present; now DowDuPont, Inc.). He served on the President’s Council of Advisors on Science and Technology (PCAST) for President George W. Bush.

Dr. Robert A. Brown (right) received an Outstanding Achievement Award during a ceremony in November 2017. Brown is pictured with President Eric W. Kaler. Photo credit: Richard G. Anderson Photography.
Alumni news

National Academy of Engineering inductees for 2018

Chun Huh (Ph.D. ChE ’69), SPE, retired research professor in the Hildebrand Department of Petroleum and Geosystems Engineering at the University of Texas-Austin (UT PGE), was elected to the National Academy of Engineering (NAE) for 2018. Huh is recognized for enhancing the understanding of ultralow interfacial tensions of oil/surfactant/water systems. He served as a research professor at UT PGE from 2004 to 2016. A Distinguished Member of SPE, Huh is a past winner of the SPE Improved Oil Recovery Pioneer Award.

Raymond J. Gorte (Ph.D. ChE ’81) was elected a fellow of the National Academy of Engineering in February 2018 for fundamental contributions and their applications to heterogeneous catalysts and solid state electrochemical devices. He is currently the Russell Pearce and Elizabeth Crimian Heuer Professor of chemical and biomolecular engineering, and of materials science and engineering, at the University of Pennsylvania. His broad research areas include fuel cells, catalysis and energy. Gorte has made pioneering contributions to the development of solid oxide fuel cells, which produce electricity from oxidizing a fuel. They accommodate a wider range of fuel sources than other cells and also have the potential to be used as carbon capture technology for reducing emissions from natural gas and coal-fired power plants. Gorte has developed a novel process for making high-performance solid oxide cells that operate on hydrocarbon fuels.

In the area of catalysis, Gorte has studied how changes in the thermodynamic properties of mixed oxides affect their ability to speed up chemical reactions of interest. Gorte has received numerous research awards, including the Paul Emmett Award of the North American Catalysis Society (1999) and the R. H. Wilhelm Award from the American Institute of Chemical Engineers (2009). In 2015, he was elected a Fellow of the Electrochemical Society.

A formal induction ceremony for the 83 new NAE members and 16 new foreign members elected in February will take place at the academy’s annual meeting in Washington, D.C., on Sept. 30, 2018.

Professional Accomplishments

Eric McCalla (Post-Doctoral Scholar, Leighton group) was appointed as a tenure-track assistant professor in the Department of Chemistry at McGill University in fall 2017. He completed an 18-month post-doctoral appointment with Professor Chris Leighton in 2017, where he examined the magnetic and electronic properties of perovskite materials. At McGill, McCalla’s primary research area is the design of advanced materials for next-generation batteries.

In Memoriam

Cary Holter (ChE ’91) passed away on October 31, 2017 after a courageous battle with cancer. Cary obtained an MBA in Florida and worked at HB Fuller.

Gary Pozarnsky (Ph.D. ChE ’94) passed away from natural causes on December 11, 2017 at his home in Roseville, Minnesota. Gary had his own research company and had several patents working with the Department of Defense.

Milestones

Maurice Fiterman (ChE ’39) celebrated his 100th birthday on February 25, 2018.

Maurice Fiterman is pictured with his late wife, Regina Grace Fiterman. Photo courtesy of the Fiterman family.

ALUMNI NEWS
Senior Send-Off & Alumni Reception

Class of 2018, hats off to thee!

Thursday, April 26, 2018
5:00 p.m. to 7:00 p.m.
West Wing of the Campus Club, Coffman
Memorial Union (4th floor)

Registration required: z.umn.edu/CEMS18

Please join us in congratulating the Class of 2018 and welcome them into the CEMS alumni family! Reconnect with CEMS faculty and alumni peers while listening to the UMN Marching Band brass quintet. Take a photo or two with Goldy Gopher!

Tax-efficient giving to the U

If you’re 70 ½ or older, you can give up to $100,000 directly from your IRA to charity, without paying federal income tax on the withdrawal. If you’d like to make a gift to the U or pay off a pledge, consider this tax-wise giving option.

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