The Catalyst
Department of Chemical & Biomolecular Engineering

In honor of
Mr. and Mrs. James S. Abercrombie
and their daughter
Miss Josephine Abercrombie

Whose generous donation has made possible
the construction of these laboratories of research, experiment, and instruction in
science and engineering.
Dear Alumni and Friends,

To use one of the most over-used words in the scientific lexicon, I write that the start of the fall semester has been… interesting. The University closed down for a week, with the torrential rains from Hurricane Harvey impacting the City of Houston and other cities in our region. Classes and operations re-started the day after Labor Day. The campus itself saw little damage, and the on-campus undergraduate students were taken care of very well. CHBE faculty, staff, and graduate students were minimally affected, thankfully, as well as Abercrombie Engineering Laboratory, our home building.

To other "interesting" news!

My faculty and I had the pleasure of watching 68 BS/BA, 18 MCHE/MS, and 14 PhD degree holders walk through the Sallyport at the 104th Commencement Ceremony this past May. This academic year, Rice has admitted a record number of new students, and we look forward to welcoming all of our new CHBE's!

I have been especially thrilled to welcome to our Department many new faculty members this year:

- T. N. Law Assistant Professor Xue Sherry Gao (Harvard)
- Assistant Professor Tom Senftle (Princeton)
- Adjunct Professor Ganesh Kailasam (Dow Corning)
- Adjunct Professor Xiankan Zhang (SABIC)
- Lecturer Mohammad Tavakkoli (Rice)
- Lecturer Margaret Senftle (Penn State)
- Joint faculty member and Assistant Professor (MSNE) Eilaf Egap (Georgia Tech/Emory)

Both Tom and Eilaf are also faculty members of the Molecular Nanotechnology Initiative at Rice.

With staff changes, we were sad to say farewell to Pam Ebling after nine years of brilliant work as Department Accountant. We are pleased to have Jon Hughes join us over the summer as our new Accountant. Since the last newsletter, we also added Carol Lewis as Administrative Coordinator and Barbara Windish was promoted to Academic Administrator.

We have a new Department website! Browse around and visit the alumni page, where you will find opportunities to participate in the activities of this active group, and hopefully re-connect with your classmates.

Best wishes for an outstanding school year,

With regards,

Mike Wong
The CHBE department introduces two new Assistant Professors who joined our ranks this year. Both were hired after a national search was conducted during the 2016–17 academic year. Special recognition goes to the Biomolecular Search Committee chaired by Laura Segatori, and the university-level Molecular Nanotechnology Search Committee (led by co-chairs Mike Wong and Matteo Pasquali) for their diligent efforts in identifying top candidates for these positions.

Dr. Xue Sherry Gao joins Rice following her postdoctoral studies at Harvard, where under the direction of Dr. David R. Liu she researched the developing treatment of genetic hearing diseases by in vivo delivery of CRISPR/Cas9 genome editing agents. Her PhD thesis “Investigation, Characterization and Engineering of Fungal Natural Product Biosynthesis” was completed under the direction of Professor Yi Tang at the University of California Los Angeles. This work with Professor Tang and industrial collaborator Codexis®, on the development of an efficient biocatalytic process to manufacture simvastatin, won the 2012 Presidential Green Chemistry Challenge Award. At the 2015 AIChE Annual Meeting he was awarded the Best Presentation for his contribution “Screening for active sites on supported metal-oxide catalysts via hybrid Monte Carlo/ molecular dynamics simulations with the ReaxFF Potential.”

Dr. Gao enjoys reading and singing (!) as well as outdoor activities including snorkeling and hiking; and she is known for her cooking skills. Her favorite foods are BBQ, Ramen, and anything spicy! She also loves to travel; one of her favorite experiences was swimming with dolphins in Cancun. One thing she is passionate about is creating a great work and life balance; her family includes husband Dr. Peng Wang, and their son Alan. Although the family does not currently have a pet, a dog is on the wish list. When asked about her feelings in joining Rice University and living in Houston Sherry stated “it is exciting for me, since I love urban life, where I experience different cultures, meet diverse people, and taste all kinds of food”!

Dr. Thomas (Tom) Senftle was brought to Rice as one of the new faculty members for the Molecular Nanotechnology initiative announced by the Provost more than a year ago. He most recently completed postdoctoral studies at Princeton University in the Department of Mechanical and Aerospace Engineering where his research focused on quantum and classical modeling approaches to catalyst design with Engineering Dean Emily Carter. He received his PhD in Chemical Engineering in 2015 from The Pennsylvania State University with his thesis “Development of Multi-scale Computational Methods for Modeling Phase Formation in Pd-Based Catalysts” under the direction of Dr. Michael Janik. At the 2015 AIChE Annual Meeting he was awarded the Best Presentation for his contribution “Screening for active sites on supported metal-oxide catalysts via hybrid Monte Carlo/ molecular dynamics simulations with the ReaxFF Potential.”

Dr. Senftle is married to Dr. Margaret (Maggie) Simons Senftle, who received her PhD in 2017, also from Penn State and has also joined the department as a Lecturer for fall 2017. Together, they enjoy playing strategy board games (she always wins!) and have embraced the Houston “restaurant scene”. They share their home with the “diva” of the household, their 17 year old cat Lily. Tom is also looking forward to living in a milder climate since he enjoys hiking and being outdoors. His favorite movies are the Lord of the Rings series, and if he could meet anyone in the world it would be the director Peter Jackson, as he is also very interested in learning about the filmmaking process.

Welcome to Rice and ChBE!
Since being formed in Spring of 2014, the ChBE Undergraduate Board (CUB) has worked hard to improve the undergraduate ChBE educational experience at Rice. The board consists of representatives from the sophomore, junior and senior classes. These representatives meet every week to discuss topics relevant to improving the ChBE program and meet biweekly with the Undergraduate Faculty Committee.

**Why was CUB originally formed?**
Rice’s ChBE program began with a relatively small class size of approximately 15-25 students. With these small class sizes, feedback was relayed with relative ease and changes were implemented quickly. Over the past decade, however, the number of students enrolled in the ChBE program has more than tripled.

In November of 2014, a temporary committee was formed to help collect feedback from the student body for an upcoming review. The committee was deemed a success, and as a result, the department decided to formalize the committee as a permanent departmental board.

**What projects has CUB worked on this year?**
This year, CUB began work by administering semesterly surveys of the ChBE student body regarding their classroom experiences and satisfaction with department resources. After reviewing the survey results, CUB decided to review the specialization options offered within the ChBE major. Currently, CUB is working to finalize an updated list of approved courses for the specializations.

Other CUB projects this year include rewriting the program educational objectives for the ChBE department, revamping the ChBE undergraduate advising system, and updating the information on the department website.
The Chevron Lecture is an annual event hosted here at Rice University to increase the visibility of energy related research among the Rice community. This year, one of our own, Professor George Hirasaki, A. J. Hartsook Professor Emeritus in Chemical & Biomolecular Engineering and member of the National Academy of Engineering, presented the lecture entitled “Enhancing Carbon Dioxide Enhanced Oil Recovery (EOR)”.

This method is of great strategic importance to realizing a “green” crude oil recovery process. By injecting CO2 into oil reservoirs, this greenhouse gas can be sequestered in these subsurface formations on a geological time scale. The highly technical nature of the lecture attracted an audience ranging from industrial professionals at major energy and service companies to Rice friends, faculty, and students from numerous diverse departments.

Dr. Aarthi Muthuswamy, a former graduate student of Hirasaki’s and current Shell reservoir engineer, was impressed by the lecture which brought back fond memories at Rice when Hirasaki taught her everything she now knows about flows in porous media.

The highlights of Hirasaki’s talk were the leading edge scientific advances his and Dr. Sibani Lisa Biswal’s research groups are making in enhancing CO2 EOR. Specifically, they have been experimenting with using foam as a dispersing agent for CO2 gas to improve the sweep of oil in the reservoir. Previously, due to the low density and viscosity of CO2 gas compared to the oil, the injected CO2 tends to float on top of the oil and fingers through the path of least resistance. Hirasaki proved that foaming the CO2 can effectively mitigate these detrimental gravitational effects by decreasing a key quantity called the mobility ratio. He also updated the audience on the latest developments in surfactant technology that can withstand the extremely harsh temperature and salinity of oil reservoirs.

Hirasaki used a 2-D sandpack model to demonstrate the smart rheology of foam that can retard flow in the high permeability regions and divert fluids to recover oil trapped in the low permeability regions. He also touched on the economics of his work, pointing out that the economic viability of the method depends on the CO2 availability, surfactant cost, and crude oil price.

A student poster competition was held prior to the lecture. Over a dozen graduate students displayed their posters and research to a judging committee composed of ChBE alumni volunteers. The competition was both inspirational and educational. Ben Yin from the Wong group who presented the use of fluorescent nano-gold particles to detect Cr(VI) won the first prize. Jin Song, of the Biswal and Hirasaki groups, and Andrea Miranda, from Dr. Verduzco’s
group, tied for second place. Jin showcased his surface complexation model which sheds light on the wettability change of rock surfaces; whereas Andrea shared her developments on an electrically-active polymer binder for Si anodes in Li-ion batteries. Yuchong Zhang, from Dr. Chapman’s group, won the third place prize with his work probing the complex phase behavior of branched chain molecules.

After the lecture, the audience migrated to the Duncan Hall Atrium where a networking dinner was hosted by the ChBE alumni advisory committee, faculty, and students. The audience mingled over dinner and shared their thoughts about the emerging trends in the energy industry. The dinner was an excellent opportunity for those present to connect and reconnect with each other. The lecture received consistently positive feedback.

Thanks to the generous sponsorship from Chevron, this annual lecture series once again brought the Rice community together to explore the forefront of the energy industry and beyond. We hope to continue this lecture series, so keep an eye out for an invitation in your inbox. We hope to see you there next year!
The third annual series of ChBE/GSA/SPE student resume reviews and mock interviews to prepare for the Fall 2017 career fair and actual job interviews was a big success despite the impacts of Hurricane Harvey.

We’d like to acknowledge the many in Houston who were directly impacted by Harvey including some of our volunteer interviewers, who were displaced by major flooding of their homes. Several other interviewers participated in rescues and evacuations of family, friends and neighbors from rising flood waters. And, many other interviewers and students participated in family and community relief efforts in the storm’s aftermath. We are most grateful to all!

Last minute decisions were made to continue the series as planned on Sep. 7, 11-13, and supported by the many alumni and friends of Rice volunteers. This year, collaboration between the Rice ChBE AIChE undergraduate and GSA and SPE graduate groups enabled full integration of a formerly parallel set of activities into one track.

Events kicked-off with a Panel Discussion / Q&A combined with a “Fishbowl” Interview (a mock interview conducted in front of an audience) attended by nearly 40 students. The panel of four ChBE alumni shared their views and experiences and fielded student questions about the overall interview process in industry today.

Over the following week, one evening was devoted to resume reviews and two evenings to mock interviews combined with resume reviews. In total, more than 40 students were scheduled for these one-to-one interactions that also made great opportunities to connect with alumni and friends of Rice. Student feedback has been very positive and included appreciation for these efforts to increase student success, especially in light of a challenging job market.

Our thanks go to the 27 alumni and friends of Rice who volunteered their time, despite Harvey, to support the students and to Karen Shelton and Barbara Windish for making the needed facilities available late into the evening each day. Our appreciation for their excellent job organizing and overseeing the events goes to Lee Pelton, Rice AIChE president; Eric Vavra, Rice SPE president; Steve Loar, Rice GSA rep to the ChBE Alumni Advisory board and Yongchao Zeng, past GSA rep.

— From the Mentoring subcommittee of the ChBE Alumni Advisory board
Panel Discussion & Fishbowl Interview

Resume Reviews & Mock Interviews
CHBE mourns the loss of Professor Emeritus Bill Akers

William W. Akers, professor emeritus, passed away Nov. 5 at age 94 following a brief illness. Dr. Akers joined the department as an associate professor in 1947, and served as chair from 1955–1965. He was an active faculty member until his retirement in 1993, and held a joint appointment in Bioengineering. In his later years at Rice he also served in administrative posts for the university. He is best known for his research with Dr. Michael DeBakey from Baylor College of Medicine that led to the development of the first artificial heart. That LVAD project was the beginning of the Biomedical Engineering Laboratory that evolved into our Bioengineering department in 1996.

Dr. Akers and his late wife Nancy, who died in 2016, have been generous benefactors to the department and the school of engineering. They established an endowment that funds the Akers Senior Design competition each year, and up until just a few years ago he attended both the competition and the Senior Banquet that followed to present the award.

Dr. Akers is survived by his two daughters, Carol Akers Klug and Susan Akers Hirtz.
For the 2017 design competition, students were challenged to convert waste feedstock from a variety of sources to valuable fuel products. Each team was assigned a waste feedstock stream and a desired fuel, but had to design all other aspects of the process, including location, scale, and process units. Moreover, the only utility available was fresh water suitable for cooling. All other utilities, including power and heat, had to be produced onsite. Teams were expected to pursue process intensification; by utilizing new and advanced technologies, teams were expected to reduce process cost, energy consumption, and size.

Our team, the Technologically Innovative Methanol Biofuel Energy Recovery Process (T.I.M.B.E.R. Process), was tasked with producing methanol from wood chips. Knowing this process is currently not economically desirable, we decided a special market needed to be found. Therefore, we designed the entire plant to fit and operate within a standard 40 ft shipping container. With this level of portability, the applicability of this plant is expanded. The plant can now be easily transported and located near remote sawmills, in low resource settings, or help an area recover from a natural disaster while consuming waste wood.

Heat within the reactor. This allowed us to convert a relatively large amount of methanol in a small reaction volume, without producing excessive waste. Moreover, the heat produced by the microreactor and other components was utilized for other process requirements, including our two distillation columns used for methanol purification, as well as energy production. This reduced our cooling water requirement and allowed our process to function more efficiently.

In order to fit this entire process into a shipping container, special attention had to be given to process intensification. Each part of the process was carefully analyzed to ensure we employed cutting edge technology and minimized waste. Overall, we made sure that all substantial opportunities for heat integration were accounted for, and worked hard to convert all waste products into a form which was useful. The best example of this is our use of cooling water - in a normal process, this water is used to remove heat, and then passed through a cooling tower, in a closed cycle (less makeup). However, we decided to use an open loop cooling system, passing out filtered hot water, which can be used for cooking, cleaning, heating, and drinking. While meeting this goal required the addition of filtration units and adjustment of our process, the end result is an efficient process that delivers fuel, heat, power, and drinking water in a portable and compact unit.

WILLIAM W. AKERS
Design Competition
2017 WINNERS
T.I.M.B.E.R.
PROCESS

Pictured (left to right): Ricky Shao, Kelly Kidder, Daniel Plants, Alex Metcalf, Itali Johnson, Michael Nelms
Thank you,
Dr. Clarence Miller

Notes from Alumni

From Professor Jong Choo Lim
Professor Miller is a well-known worldwide authority in the field of interfacial phenomena including interfacial stability, foams, emulsions, microemulsions, enhanced oil recovery, multiphase flow in porous media, detergency, and aquifer remediation processes with surfactants. He has published more than 130 papers in the major journals related to colloids and interface sciences and presented papers numerous times at international meetings. Along with his former student, Professor P. Neogi, he has authored the book, “Interfacial Phenomena: Equilibrium and Dynamic Effects”, now in its second edition, and which is known as the Bible in the field of colloids and interfacial sciences. He has been working as a core member at many honorary and professional societies such as American Institute of Chemical Engineers, American Chemical Society, Society of Petroleum Engineers, American Oil Chemists’ Society, International Association of Colloid and Interface Scientists, Sigma Xi, Phi Beta Kappa and Tau Beta Pi. He also served on the editorial board for Journal of Colloid and Interface Science (1995-1998), Colloids and Surfaces (1986-2003), and Current Opinion in Colloid and Interface Science (1996-2001).

Professor Miller has been an outstanding teacher to his undergraduate and graduate students. He devoted plenty of time for their education and enjoys technical discussions with students. He provided his students with abundant knowledge, attainment and high motivation for developing a successful career. He has been an excellent academic advisor for his graduate students from many countries including the USA, France, Greece, India, China, Korea, Japan, Taiwan, Thailand, Bangladesh, and Venezuela. He has been a superior advisor to his graduate students, cultivating academic knowledge and integrity, training thinking power and initiative, and enhancing creative talent. Thanks to his valuable teaching and guidance, his former graduate students have played a major role in industries and universities all over the world. Professor Miller is very dedicated to teaching students and performing research. Thanks to his valuable efforts, many students have accomplished a successful research career at the universities and have made a significant contribution to the development of chemical engineering industries in many countries.

Dr. Jong Choo Lim received his Ph.D. in Chemical Engineering at Rice University and is a professor at the Department of Chemical and Biochemical Engineering, Dongguk University in Seoul, Korea where he teaches and advises many undergraduate and graduate Chemical Engineering students.

From Dr. James L. Hackett III
Dr. Miller is known for graduating students from his program with strong academic training. However, I will always appreciate Dr. Miller for providing his students the opportunity to develop other skills that are critical for success in the workplace.

Every year Dr. Miller hosted a symposium to which he invited scientists from the Production Research departments of the major oil companies who funded our research. Each student was required to prepare and deliver a formal presentation. These symposia allowed students to interact with well-known industry scientists on both a personal and professional level and to learn about the practical application of the research done by the group.
These symposia helped me hone my presentation skills and to develop confidence in my public speaking ability. These skills have proven to be every bit as valuable to my career success as my academic training. And, because of the networking that these symposia provided, I received job offers from two of the participating companies!

Dr. James L. Hackett received his B.S. degree in Chemical Engineering from Carnegie Mellon University and Ph.D. degree from Rice University. He is currently Plant Manager at Sasol North America in Tucson, Arizona where ultra-high purity aluminum oxide is made that customers convert into synthetic sapphire used as a substrate for manufacturing blue LEDs, phosphors that are used in lighting, LCD, plasma displays, technical ceramics, and bioceramics. Dr. Hackett's advisor, Professor Clarence A. Miller, also a Rice alumnus, graduated with B.A. and B.S. degrees from Rice University and served as chair of the Chemical Engineering department from 1989 to 1995.

From Mr. John T. Perez, P.E.

Since leaving Rice, I have heard it said many a time that A&M and UT do a good job of telling their students that they have what it takes to be the entrepreneurs of the future. That may be true, but I believe that Rice teaches its students how to be the entrepreneurs of the future. My years at Rice toiling through the rigorous chemical engineering curriculum showed me how to tackle the single most important challenge that any entrepreneur will face (aside from capital or lack thereof)...and that's how to solve ambiguous problems.

I am sure that all of us remember the countless nights (and days) spent figuring out seemingly unsolvable homework sets. I remember one night in particular working on a transport phenomena problem that Dr. Miller had assigned. Nobody could figure it out after a handful of hours (sorry bunch huh?!), but then all of a sudden somebody made a mental leap that helped the group progress. A lot of folks might think that the real accomplishment and success came in that mental leap; however, I have come to realize that the true value lay in the hours spent trying to solve the problem. In business (and life in general), entrepreneurs are bombarded with ambiguous problems. Oftentimes, they do not know where to begin. For some, the barrage of fuzzy issues is too much and they give up shortly after starting up. Based on my experience, an engineer (at least a chemical engineer) from Rice not only rises to the challenge time and again, but also engages and embraces the "gray".

Clarity and discipline are essential to be successful in running a company. The faculty of the Rice chemical engineering department may not recognize the value added by their tutelage to general business management, but I certainly have benefited from their guidance or lack thereof in some cases. It is great to see our business school rise in the rankings, but let’s not forget the heritage and legacy that our chemical engineering department brings to the business world beyond technical applications.

Mr. John Perez, P.E., received his B.S. degree in Chemical Engineering from Rice University. He is co-owner of Cognascents, a provider of process engineering, process safety, environmental, and technical business solutions. John has served Rice in several positions with the Rice Engineering Alumni Association including President, and serves as a volunteer instructor in Process Safety.
Brandon Zuniga

Reflecting on my journey outside The Hedges, I am pleasantly surprised at how many fellow ChBEs have continued to cross my path. Right out of college, I worked at Fluor with Howard Chao and Stella Unruh, helping to design petrochemical facilities.

Then, in 2008, Pachelbel’s Canon wafted through the tropical foliage of The Selby Botanical Gardens, as I married Michelle Garriques, a Rice Archi that I first met during O-Week. We stayed in Houston for another two years while Michelle finished up her graduate degree at Rice and then started work as an architect. One of the highlights of our week was hanging out after church with fellow ChBE, Jimmy Jessup, and his wife Deb. Little did we know that we would also see them in Maine, The Hague, Munich and Dallas. Now it seems that no world travel is complete without a stay at Hotel Jessup.

In 2010, Michelle and I jetted off to Boston so I could attend law school at Boston University. There was no shortage of ChBEs there, between visitors and fellow students, such as Kush Mathur and Stella Unruh, who were studying at Harvard. Whether hiking or skiing in Vermont, soaking up the sun on Cape Cod, or just riding our bikes along the Charles River, our life in Boston was a great adventure that we thoroughly enjoyed.

In 2013, we headed back to Dallas where most of my family lives, and where I now work as an attorney.

Our son Caeden was born in 2015, and judging by his interest in vacuum cleaners, I wouldn’t be surprised if he becomes an engineer. Michelle and I are now expecting our second son, and have moved into a house near White Rock Lake. We think we might actually stay in one place for more than a few years. But, then again, who knows?

Jimmy Jessup

After Rice, Jimmy joined Shell as a process / flow assurance engineer for deepwater projects in Houston. Jimmy and Ian Sergo self-trained on the Navy SEALs program for a year, after which they both gave up remotely-pro status to pursue greener pastures. Jimmy married Deborah Huang (Wiess ’08) in 2009 after proposing on the rooftop of Dell Butcher.

In 2013, Jimmy and Deb snagged an offer from Shell to live in the Netherlands for a couple years, then in Munich for another year. This gave them a chance to really pound the pavement and delve into a major passion of theirs, immersive traveling. Six weeks of vacation as an expat is cushy, but its still possible to use it up fast! Four years in Europe had Jimmy and Deb in agony when the call came to return to the States; good memories of windmills and Oktoberfest still dance in their heads.

After a short foray back in Houston where Jimmy took the bus to work trying to recreate a European feel in Texas, Jimmy and Deb moved to Pittsburgh in August of 2017. Jimmy works on a greenfield Shell chemical plant construction site, and Deb freelances as an industrial designer.
Ian Sergo

After graduating from Rice, Ian joined a small process safety consultancy, Celerity3 Engineering, as a Process Engineer. He transitioned into a Business Development role after learning the sales and marketing aspects of the business. During non-working hours he followed the Navy Seals training program with fellow ChBE (and co-MC of the Senior ChBE dinner) Jimmy Jessup. While neither Jimmy nor Ian became Navy SEALs, they did survive a bat attack during one of the runs under Waugh bridge!

Ian left Celerity3 in December of 2010 to join John Perez (Rice ChE ’96) at a two-man startup called Cognascents Consulting Group. As 2011 rolled around, major life changes came as Ian and his now wife, Raquel Welsh, became engaged and the decision was made to move back to CT. Ian and Raquel were married on August 18, 2012 with several Rice alums in the wedding party. With the move came a change in jobs, and Ian joined the American Institute of Chemical Engineers as a Sales and Business Development Manager. In 2015, Ian took a 15 month break from AIChE to get back to engineering work with Inglenook Engineering. He has since re-joined AIChE as the Director of Sales. Raquel works as a Sales Manager for Wild&Wolf and both she and Ian spend much of their days on Metro North Rail on the way into NYC.

Ian and Raquel enjoy traveling, live music, and sneaking in the occasional round of golf. They live in Norwalk, CT.

Help Us Keep You in the Know!

To our Rice ChBE Alumni – We have two email distribution lists – one for the greater Houston region and one for everywhere else to keep you in the loop on the following Rice ChBE alumni activities:

1. Major ChBE alumni events such as Fall Networking and the Spring Energy Lecture;
2. Short-term mentoring support needs; and,
3. The e-version of this newsletter.

We need your help to keep your email address current. To recent grads, we probably don’t have your non-student address; could you please send us your preferred address and zip code? And, to all alumni, please send your updates as relevant. Updates including zip code should be addressed to:

RiceChBEAlumSecretary@ gmail.com

Many thanks from the ChBE Alumni Advisory Committee!
When I finished my degree in 2012, I was the only one of my CHBE classmates who jumped full time into classroom teaching. I spent three years teaching AP Calculus and PreCalculus at a Houston charter school, following a growing passion for being involved in the work of education equity. The work was both extremely rewarding and emotionally exhausting, filled with the highs of watching students master mathematics that they once believed impossible and the lows of late nights and weekends grading or lesson planning. It was an experience I will never forget and that has shaped my view of what I want the rest of my career to look like.

While I recognize that most CHBE grads from Rice will not become full-time teachers, I think we all have a role to play in the future of engineering – and by extension, the journeys of young, future engineers. Many of us studied engineering because we were excited about working on the most challenging problems facing the world, to apply our passion for math and science, and to have stable and fulfilling careers. I believe that there are thousands of kids in schools all across the country who want these same things, but may not have the skills, knowledge, or confidence to make it happen.

This is where I think that we can step in. Here are five meaningful ways to do this:

1. **Volunteer** – find a school or community center near you and spend a few days a month tutoring kids before or after school. Help them with college applications and build supportive relationships.

2. **Inspire** – find opportunities to present about engineering, to talk about the work you do, and get young people excited about following in your footsteps. Demystify what engineering looks like and make it more accessible.

3. **Donate** – there are so many organizations doing great work to help students (and particularly students from under-represented backgrounds) pursue STEM careers. Find ones who do this in a way you believe in and help fund their work!

4. **Mentor** – take a few kids under your wing. Be a guide, a cheerleader, an advocate, and a friend. You will likely learn as much from them as they do from you.

5. **Teach** – kids deserve to learn from teachers who have deep knowledge of their content. Whether you graduate in 2020 or finished Rice 20 years ago, your CHBE knowledge makes you a content expert that students could learn so much from.

It is likely that one or more people played a key role in you becoming an engineering student and graduate. What better way to show your gratitude than to carry on their legacy in the lives of other young people?
The Chemical and Biomolecular Engineering Alumni Committee has established the Professional Excellence Award to honor one faculty member every 2 years who has made an outstanding contribution to the education of undergraduate and/or graduate students.

**Eligibility**
- Current or former professor who has served at least 4 years in the Chemical & Biomolecular Engineering Department
- They need not still be at Rice and can be retired
- Must be living at the time of the nomination
- Cannot have won in the past 5 years

**Voting**
- Awarded by voting by current students who have been at Rice >2 years and alumni
- Votes requested by email solicitation and collected by a point contact in the alumni advisory committee

Criteria also listed online: [https://chbe.rice.edu/pea/](https://chbe.rice.edu/pea/)

**Congratulations to Dr. Sibani Lisa Biswal**
for receiving the 2017 Award, which was presented at the Fall CHBE Networking event held on November 9th.
Sibani Lisa Biswal  
Associate Professor, Chemical & Biomolecular Engineering, Materials Science & NanoEngineering; Ph.D. Stanford, 2004  
Interactions of colloidal particles with solid and liquid media, interfacial behavior of biomolecules.

Walter G. Chapman  
W. W. Akers Professor, Chemical & Biomolecular Engineering; Associate Dean for Energy Research; Ph.D. Cornell, 1988  
Thermodynamics, statistical mechanics, polymer solutions, surface fluid interactions, molecular simulations, gas hydrates, waxes and asphaltenes.

Kenneth R. Cox  
Director, Undergraduate Studies; Professor in the Practice, Chemical & Biomolecular Engineering; Ph.D. Illinois, 1979  
Product and process design, phase equilibria for advanced separations design.

Xue Sherry Gao  
T. N. Law Assistant Professor, Chemical & Biomolecular Engineering; Ph.D. University of California, 2013  
The interface of chemical biology and biomolecular engineering with primary focus on small- and macro-molecule discovery and their applications to human health, agriculture, and energy.

Ramon Gonzalez  
Professor, Chemical & Biomolecular Engineering, Bioengineering, Director, iBio Initiative; Ph.D. University of Chile, 2001  
Metabolic engineering, functional genomics, systems biology, microbial fermentations, chemicals and fuels from renewables.

George J. Hirasaki  
A. J. Hartsook Professor Emeritus of Chemical & Biomolecular Engineering, Research Professor; Ph.D. Rice, 1967  
Foams and emulsions, aquifer remediation, NMR measured transport properties of fluids and rocks, enhanced oil recovery, gas hydrates and carbon capture.

Frederick C. MacKintosh  
Abercrombie Professor of Chemical & Biomolecular Engineering, Professor, Chemistry, Physics & Astronomy; Ph.D. Princeton, 1989  
Fundamental material properties of biological and soft matter networks.

Matteo Pasquali  
Professor, Chemical & Biomolecular Engineering, Chemistry Department Chair; Ph.D. Minnesota, 1999  
Micro- and nano-structured liquids, carbon nanotubes, free surface flows, computational modeling of processing flows.

Marc A. Robert  
Professor, Chemical & Biomolecular Engineering; Ph.D. Swiss Federal Institute of Technology, Lausanne, 1980  
Thermodynamics, interfacial phenomena, thin films, random media.

Thomas Senftle  
Assistant Professor, Chemical and Biomolecular Engineering; Ph.D. Penn State, 2015  
Development and application of computational modeling tools for assessing complex, multi-component catalysts at both the electronic and atomistic level.
Laura Segatori  
Associate Professor, Chemical & Biomolecular Engineering, Bioengineering, Biochemistry & Cell Biology; Ph.D. University of Texas at Austin, 2005  
Molecular engineering of protein folding catalysts and chaperones.

Francisco Vargas  
Assistant Professor, Chemical & Biomolecular Engineering; Ph.D. Rice University, 2010  
Phase behavior and flow assurance.

Rafael Verduzco  
Associate Professor, Chemical & Biomolecular Engineering, Materials Science & NanoEngineering; Ph.D. California Institute of Technology, 2007  
Polymer design and synthesis, organic electronics, liquid crystals, and polymer self-assembly.

Michael S. Wong  
Department Chair and Professor, Chemical & Biomolecular Engineering, Chemistry, Materials Science & NanoEngineering, Civil & Environmental Engineering; Ph.D. MIT, 2000  
Catalysis, quantum dots, hollow microspheres, materials chemistry, green chemistry, nanotechnology.

Kyriacos Zygourakis  
A. J. Hartsook Professor, Chemical & Biomolecular Engineering, Bioengineering; Ph.D. Minnesota, 1981  
Cellular and tissue engineering, chemical reaction engineering, biochar for soil amendment, energy and sustainability.

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The ChBE Alumni Advisory Committee was established in 2009 and has been active over the past 7 years supporting the ChBE department, alumni, and students. Over the past year we have set up sub-committees with focus on the following specific areas.

**Networking and Events** - Organizes networking events for students, alumni, and faculty along with the AICHE student chapter and Graduate Student Association (GSA). There are typically two per year – we help with the Chevron Lecture on Energy in the spring semester and put on the Alumni Networking Event in the fall, usually around homecoming.

**Newsletter** — Produces the annual ChBE Newsletter. This includes writing and collecting articles, collecting alumni updates, editing, and coordinating the distribution of the newsletter to all Rice Chemical Engineering alumni.

**Mentoring** — Fosters and facilitates AICHE student chapter and ChBE GSA goals to bring students together with motivated alumni for mentoring activities, especially around support for job searches, such as interviewing skills and resume reviews. Also includes engaging alumni and developing ideas for short-term mentoring activities.

**Corporate and Development** — Enhances long-term connections between companies, the department, and the Alumni Advisory Committee.

**Website** — Maintains the Alumni section of the ChBE website and organizes social media outreach to alumni.

We are always looking for enthusiastic alumni to help serve on the committee or work on projects. If you are interested in joining one of our Sub-committees, contact Charles Meyer (RiceChBEAlumSecretary@gmail.com).

As a reminder, we send out event reservation information through the Rice alumni office, so make sure your contact information is up to date on the online alumni directory (https://online.alumni.rice.edu).