KOFFOLT NEWS

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WILLIAM G. LOWRIE DEPARTMENT OF CHEMICAL & BIOMOLECULAR ENGINEERING

THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

This Issue:

Alumni share wisdom, win awards, hold reunions
Umit Ozkan named Distinguished University Professor
Chemical looping applications

Letter From The Chair

Dear Alumni and Friends,

This past fall was an especially invigorating time as we welcomed students back to campus for in-person classes. Returning students got to reconnect with their classmates, and freshmen took their first steps into the 'great unknown' of their college careers.

Thirty-seven years ago, when I was first starting at Ohio State, I welcomed students to campus for the first time and soon settled into the annual event. It always fills me with delight, because being able to nurture one's students and see them grow and blossom into multi-talented professionals is one of my greatest rewards in life.

That's why this past summer's virtual reunions of the Classes of 1987 and 1988 were so much fun for me! I got to catch up with students from my earliest days at Ohio State. On two separate weekends in August, each class met virtually to catch up with old friends, reconnect, and share stories. What a marvelous array of professional and personal experiences each person had to share! It really is true: with a chemical engineering degree, one can do just about anything. You can see some of the people who attended the reunions on page 11, including **Bob Patel**, '88 (whom we also happened to feature in this issue, along with **Christina Sistrunk**, '82). Some people were not able to attend, but still shared their news with us. Thank you so much to everyone.

In other news, alumni should be proud to know that our undergraduate chemical engineering program again made it into the top 25, ranking #23 in ***US News & World Report's 2022 Best Colleges*** Issue!

We are also proud of our alumni who won awards this year. From scholarship to community service, alumni make their own unique contributions that benefit society in some way. Too late for this issue of Koffolt News, we learned that three alumni recently won College of Engineering Awards: **Nancy Dawes**, **Alissa Park**, and **Aisha Barry**! More about those next time.

Please do let us know when you or your peers have special achievements to celebrate, as news of your successes do not always reach us and we would like to celebrate with you. I love to hear from you!

Within the department, I would like to also share some items related to staff. First, I wanted to congratulate **Sean Gallagher**, our director of development whom many of you know, on obtaining his MBA!

Also, we were thrilled to welcome several new staff members. **Shannon Aliff** joined the team as our program assistant and has been a tremendous asset. **Lance Kearns** took on the duties of building coordinator and **Anthony McCoy** is our new laboratory supervisor. All of our new staff are great and we feel very blessed to have attracted people of such calibre.

We also had some faculty changes this year. Assistant Professor **Li-Chiang Lin** decided to return to Taiwan but is continuing on with us as an adjunct associate professor, and **Andrew Tong** is no longer teaching, but continues as a research assistant professor.

I'm sure it is no surprise that the rest of our faculty continue to achieve success and major grants, which provide fantastic research opportunities for our students. A few highlights: **Stuart Cooper** was named to the *National Academy of Inventors;* **Lisa Hall** won the *2021 AIChE Owens Corning Early Career Award;* **Andre Palmer** was named associate dean for research in the College of Engineering, received the *2021 Gaden Award,* and four major grants; and **Jessica Winter** was named *Fellow* of the American Institute of Chemical Engineers, the Biomedical Engineering Society (BMES), and the internationally-renowned Royal Society of Chemistry (RSC), all in the same year! Read more about these and other awards beginning on page 20.

Also, from a news-related perspective, I would like to share that I was humbled to be named an Ohio State University Distinguished University Professor. What an honor, and a complete surprise! Who knew that our new program assistant; the faculty; and even my husband were so good at keeping secrets when I was called to a meeting that involved the University President, Provost, Dean of Engineering, several Associate Deans and our faculty to announce this recognition?

May you all enjoy a wonderful new year, and remember, now more than ever, it is so important to keep in touch with one another. Check up on your old friends; let us know how you are doing; and consider visiting campus whenever you are able. We would love to see you.

With warmest regards,

Umit S. Ozkan
Department Chair
Distinguished University Professor
College of Engineering Distinguished Professor

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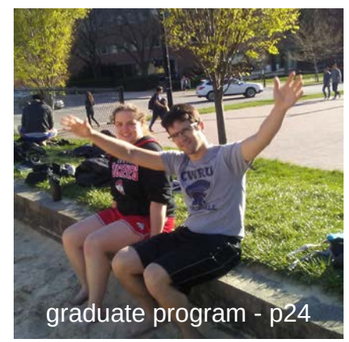
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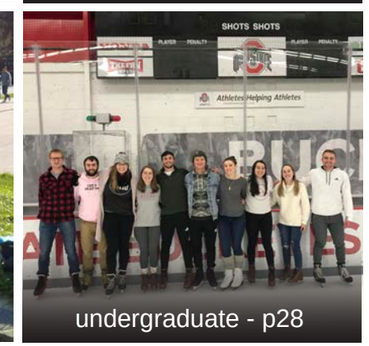

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AWARDS AND HONORS

SHWETA SINGH:

AICHE EARLY CAREER AWARD

Shweta Singh ('11 MS, '12 PhD), assistant professor of agricultural and biological engineering and environmental and ecological engineering at Purdue University, received the 2021 American Institute of Chemical Engineers (AIChE) Environmental Division Early Career Award for her research on the advancement of systems methodologies for Life Cycle Analysis (LCA) and creation of cloud-based computational tools for sustainability assessment.

“This award recognizes the critical role of interdisciplinary engineering in solving major environmental challenges today by creative pursuit of innovative modeling and computational tools,” Dr. Singh said. “It is a testimony of rigor, innovation and hard work of Purdue students who are eager to solve the toughest problems that advances the scientific field of environmental science and engineering for building a sustainable world.”

“I am humbled and thankful for this recognition by AIChE, especially because solving the issue of climate change and resource sustainability is an urgency for our planet now,” she continued. “I am also very grateful to the support of colleagues and leadership of Agricultural and Biological Engineering, Davidson School of Chemical Engineering, and Environmental and Ecological Engineering for enabling a truly interdisciplinary culture at Purdue.”

Singh was nominated for the award by Rakesh Agrawal, the Winthrop E. Stone Distinguished Professor of Chemical Engineering. The award will be delivered in November at the AIChE Annual Meeting, where Singh has been invited to give an address.

Singh joined Purdue Engineering in 2014. She leads the Sustainable Industrial Natural Coupled Systems (SINCS) group whose research focuses on coupling the growth of biobased economy and industry with local and global ecological sustainability. Prior to joining Purdue, she was a postdoctoral fellow at the University of Toronto from 2013-2014. She received her BTech in Chemical Engineering from the Indian Institute of Technology, Banaras Hindu University (2006), and both her MS in Applied Statistics (2011) and PhD in Chemical Engineering (2012) from The Ohio State University.

"It is a wonderful recognition," said her former advisor at Ohio State, Richard M. Morrow Professor **Bhavik Bakshi**. "Her work shows how the principles of chemical engineering can be used to address many of the most pressing challenges humanity faces today. I wish her all the best for her future endeavors."

AIChe is the world’s leading organization for chemical engineering professionals, with more than 60,000 members from more than 110 countries.

LINDA BROADBELT:

AMERICAN ACADEMY OF ARTS AND SCIENCES MEMBER

Linda Broadbelt ('89) was elected a member of the American Academy of Arts and Sciences, one of the nation’s oldest and most prestigious honorary societies. She is among 252 artists, scholars, scientists, and leaders in the public, nonprofit, and private sectors to be included in this year's class.

Broadbelt is Sarah Rebecca Roland Professor and professor of chemical and biological engineering at Northwestern University's McCormick School of Engineering. She also serves as associate dean for research at McCormick.

Broadbelt's research and teaching interests are in the areas of multiscale modeling, complex kinetics modeling, environmental catalysis, novel biochemical pathways, and polymerization/depolymerization kinetics.

A member of the National Academy of Engineering, Broadbelt is internationally recognized for contributions in complex kinetics modeling of hydrocarbon chemistry, particularly for the development of automated mechanism generation techniques and methods for specification of rate coefficients. She applies her computational expertise to diverse fields, including catalysis, degradation kinetics, and biological pathway identification. Much of Broadbelt’s work has been adopted by industry.

Her honors include selection as the winner of the R.H. Wilhelm Award in Chemical Reaction Engineering from AIChE, the E.V. Murphree Award in Industrial Chemistry and Engineering from the American Chemical Society, the Dorothy Ann and Clarence Ver Steeg Award, a CAREER Award from the National Science Foundation, and an AIChE Women’s Initiative Committee Mentorship Excellence Award, selection as a Fellow of the American Association for the Advancement of Science, a Fellow of AIChE, and a Fulbright Distinguished Scholar, appointment to the Defense Science Study Group of the Institute for Defense Analyses, and selection as the Su Distinguished Lecturer at University of Rochester, Ernest W. Thiele Lecturer at the University of Notre Dame and the Allan P. Colburn Lecturer at the University of Delaware

The American Academy of Arts and Sciences was founded in 1780 by John Adams, James Bowdoin, and others who believed the new republic should honor exceptionally accomplished individuals and engage them in advancing the public good.

The Academy’s dual mission remains essentially the same 240 years later with honorees from increasingly diverse fields and with the work now focused on the arts and humanities, democracy and justice, education, global affairs and science.

JAMES AND PATRICIA DIETZ:

GERLACH AWARD

James Dietz ('69, '70) and **Patricia Dietz** received one of The Ohio State University's highest awards for philanthropy and volunteerism -- the ***John B. Gerlach Sr. Development Volunteer Award.*** The honor recognizes those who show the greatest dedication and personal investment in university fundraising efforts.

"Through their ongoing generosity and dedication to the advancement of academic excellence, research and innovation that benefits people on our campuses and in the communities we serve, Corrine and Bob Frick and Jim and Pat Dietz are living embodiments of Ohio State's foundational vision and values," said President Kristina M. Johnson. "Together, they are creating opportunities and facilitating discoveries that both change lives and save them. They have forged a pathway that will inspire others for generations to come."

Jim and Pat Dietz established an endowed scholarship that provides significant support for six to seven engineering students each year. They continue to mentor students even after graduation.

Four years ago, the Dietzes initiated a conversation with the College of Engineering to start a Triple Match Campaign, providing three-to-one matching funds to help encourage young alumni to contribute. They have led this effort every year since. James Dietz, a 1969 and 1970 graduate of Ohio State's chemical engineering program, began volunteering with the university in 2008 and enjoys engaging with students in the classroom and offering advice.

"After sitting down with students, I have really learned the importance of listening to and talking with young people," James Dietz said. "These experiences illustrate what a great community Ohio State is and what motivates Pat and me to be involved — the people: administration, faculty, alumni, friends and above all, the students."

James Dietz was the College of Engineering's co-chair for the But for Ohio State Campaign, helping to drive this fundraising effort to exceed the college's goal. The Dietzes made a gift during this campaign to name the Unit Operations Laboratory, a mainstay of hands-on learning for undergraduate chemical engineers, within the new Chemical and Biomolecular Engineering and Chemistry Building. James Dietz currently serves as the College of Engineering's chair for the Time and Change: The Ohio State Campaign, and the college is already halfway to its fundraising goal of $450M.

"I've had the good fortune of meeting Jim and Pat, and as you can guess, they are absolutely wonderful people, and I am incredibly grateful for them," said College of Engineering Dean and Monte Ahuja Endowed Chair Ayanna Howard. "I look forward to many more interactions with the Dietzes and with our other amazing alumni and donors."

KUNAL PARIKH:

WILLIAM OXLEY THOMPSON AWARD

Alumnus and entrepreneur **Kunal Parikh** ('12 BS) excels in whatever he does. And one of the things he does best is to serve others.

Parikh's journey of service has been punctuated by encouragement. A former Ohio State Morrill and Denman Scholar, he received the Roche/ARCS Scholar Award at the National Academy of Sciences in 2014 and 2015 as a Johns Hopkins graduate student. In 2020, ***Forbes*** magazine named him to its "2020 30 Under 30 in Healthcare" list.

He received his most recent award on October 7, 2021 as one of eight alumni recognized by The Ohio State University Alumni Association. His award, the *William Oxley Thompson Alumni Award,* recognizes young alumni with distinctive achievement in a career, civic involvement or both.

Dr. Parikh, now a faculty member at the Johns Hopkins University School of Medicine, leads a team aimed at finding and commercializing biomedical solutions for unmet medical needs. He is founder of the Global Institute for Vision Equity and co-founder of the Social Innovation Lab in Baltimore. He founded Core Quantum Technologies while working as an undergraduate in the lab of Ohio State Professor **Jessica Winter**.

Parikh doesn't just work a job. He feels a moral imperative to mitigate poverty, improve access to healthcare and education, and achieve better quality of life for people via his entrepreneurial medical innovations.

The challenges draw him into constant thought about how to allocate more resources and talented people to problem-solving and accelerating the development and deployment of solutions.

First must come understanding. "We need a deep understanding of the barriers to health care for people worldwide and cohesive efforts to implement tailored solutions to overcome those barriers," he said.

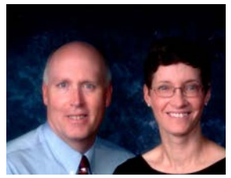
"I'm convinced that technology + entrepreneurship + compassion is the formula for transformative, long-term impact," he said.

What motivates someone so young to be so service-minded?

Parikh realized the importance of health when he was young and often sick, he said. He also gained compassion by witnessing suffering while visiting India.

"Today, I'm driven by a desire for all living beings to be happy, and a sense of gratitude that I can spend my time being of service to others," he said.

During the Alumni Awards ceremony, Parikh thanked Drs. **David Tomasko** and **Jessica Winter** for encouraging him in research as an undergraduate. "I don't think I would be where I am today had I not followed that path," he said.



Dan and Ellen Coombs

DAN COOMBS NAMED *AICHE PHILANTHROPIST OF THE YEAR* FOR K-12 STEM OUTREACH PILOT PROJECT

Opening the mail is sometimes nothing more than receiving bills, but **Dan Coombs** ('78) and **Ellen Coombs** ('79) got a nice surprise recently—a letter from the American Institute of Chemical Engineers (AIChE) congratulating them on being named the *2021 AIChE Philanthropists of the Year!*

In January of 2021, Dan had joined the AIChE Foundation Board of Trustees, which is running its *Doing a World of Good* campaign aimed at bringing the best of chemical engineering to the world. The effort inspired Dan, and he and Ellen discussed with AIChE how they could participate in the campaign while partnering with Ohio State. With the world's ever-increasing need for chemical engineers, they found the perfect project: the Ohio State AIChE student chapter could pilot a newly-designed K-12 STEM Ambassador program in Columbus-area middle school classrooms.

"The purpose of the program is to spark interest about engineering and STEM in the future generations, intentionally supporting AIChE's commitment to diversifying the next cohorts of talent," Dan said. "The goal is to increase outreach to female and minority students and hopefully recruit talented young people whose diverse backgrounds can enrich and strengthen our discipline," he said.

The project serendipitously fell into the laps of AIChE students who view volunteering as an important part of their education. "As students of The Ohio State University, we are dedicated to the university's 'Education for Citizenship' motto," said **Matt Greenwaldt**, AIChE President.

The project initially fell to **Elizabeth Ostadali**, AIChE's internal vice president, who met with the AIChE national board to get an overview of the program. Elizabeth immediately saw the project's potential and felt fortunate. "It really shows how much opportunity there is at Ohio State," she said. "This project could have gone to any school in the United States, but it came to us. It's amazing to have all these resources and work with the kids and make an impact," she said.

Zachary Gemmer, a former youth counselor with a passion for mentoring youth, was a natural fit to co-lead the program. "I thought it was exciting that I could share some of the things I touch and learn every day with a bunch of kids who are brand new or know very little about the field," Zachary said.

After meeting again with AIChE National; Larry Sernyk from Dow Chemical, which donated the materials; and local schools, Elizabeth and Zachary realized that they first had to expand their team. AIChE Executive board members **Lilly Vagedes** and **Tori Ostrow** were excited to join, and six other students were selected from a pool of 27 excellent applicants.

It wasn't easy to get the ball rolling, however. "The students got good support from AIChE and Dow, but had some real hills to climb to get this started," Dan Coombs said. "I am proud of them in so many ways."'

After reaching out to several schools, Larry Larson Middle School was identified as a good fit in terms of curriculum and resources. Elizabeth and Zachary pulled the project together in just two weeks. Each Friday classroom session was planned a week ahead, with a group training held on Sundays.

As a means of maximizing impact in the classroom, Elizabeth and Zachary applied a collaborative and integrative approach to the classroom workshops. "We wanted to keep the students collaborating together in an environment of creativity," Zachary explained. "To do that, we had to build a relationship first. We went in and first got to know the students so they would know and recognize us. After that, they were engaged," he said.

"The response was better than anticipated," Elizabeth said. "The hands-on stuff really drew them in."

Some of the Ambassador-hosted workshops involved learning about practical methodology; absorption, solubility, precipitate, filtration, and extraction; monomers and polymer chains; and analyzing fatty oils.

OSU Ambassador Sparsh Balabadrapatruni works with fourth graders extracting the DNA of strawberries.

> *"The joy I got out of touching the lives of youth in our community and exposing STEM to them in a fun and collaborative setting was the most fulfilling experience I've ever had."*
>
> -OSU Ambassador Zachary Gemmer

In one experiment, students extracted strawberry DNA. Frozen strawberries were mashed and mixed with soapy water and salt to break down the cell membranes; filtered; and then mixed with alcohol to force the DNA to separate. The DNA was then extracted with pipettes and placed into capped Eppendorf tubes, which students took home.

Students also enjoyed chromatography, the separation of a mixture by passing it in solution or suspension or as a vapor (as in gas chromatography) through a medium in which the components move at different rates. In the lab, CBE students have done experiments in which they had a mixture of components with different polarities that were put on TLC paper. The mixture was put in either a polar or non-polar solvent. If the solvent was polar, it would bring the solute up the solvent front. If it was not polar, it would not go as far up the TLC plate.

In order to introduce the middle schoolers to this concept, OSU Ambassadors used colored markers. Using dyes, students could see the colors separate into their primary colors. The kids were engaged and excited to see their chromatography paper filled with vibrant colors right before their eyes. Since the composition of colors is similar to the composition of chemicals, this is a useful introduction to understanding how chemicals combine to create mixtures.

Next semester, Tori Ostrow and Lilly Vagedes will be the team leaders. They hope to expand the number of experiments and make a few improvements based on feedback from the students and teachers.

"This program is important because I came from a small town that never had such a program," said Lilly. "My interest in science would have been sparked a lot sooner with a program like this, so seeing these kids get really interested because of an experiment makes me feel better."

Tori agreed. "Doing this feels really important. If I can help more people get involved in STEM; if I can inspire some little girl to be involved in STEM: I think that is really amazing."

In all, 63 children benefitted from the program, and Zachary and Elizabeth created a complete handoff package that will be accessible nationally for more schools to follow their lead. As a first step in bringing attention to the project, Zachary, Elizabeth, Lilly and Tori gave a presentation about their experience at the recent AIChE Annual Student Conference in Boston.

"The pilot laid out an excellent framework to continue in Columbus and start with other student chapters across the country," Dan Coombs said.

Members of the Ohio State AIChE newly-created K-12 STEM Ambassador program spell out 'AIChE' and 'Ohio' during their first visit to a local school. *Bottom row (kneeling, left to right):* Tori Ostrow, Alexis Davis, Lilly Vagedes, Elizabeth Ostadali. *Top row (standing, left to right):* Zachary Gemmer, Rawad Almhana, Sparsh Balabadrapatruni, Katie Bennett, Eva Boeckl, Bilal Saleh

OLIVIA KREBS and AJAY SHANKARAN: *NSF GRADUATE RESEARCH FELLOWS*

Two recent graduates of Ohio State chemical engineering received *National Science Foundation Graduate Research Fellowship (NSF GRFP)* awards.

Olivia Krebs ('18), who worked in the laboratory of Professor **David Wood** as an undergraduate, is currently a doctoral candidate at Case Western Reserve University and works at Capadona Lab.

Ajay Shankaran (BS '20), previously an undergraduate in the laboratory of Professor **Eduardo Reátegui**, is currently a doctoral student in chemical engineering at the University of Michigan. He is studying cancer metabolism and immune cell interactions, with a focus is on how cancer cells manipulate the immune system through cellular messengers. Back when he was a freshman at Ohio State, he hadn't been entirely sure what he wanted to do. However, the professors in CBE gave him opportunities to learn about his options in engineering, and this helped him to narrow his interests. Shankaran hopes to transition into the pharmaceutical industry and work in the development of immunotherapies after finishing his doctoral degree.

The NSF GRFP award is not only considered a prestigious honor—NSF Fellows are anticipated to become knowledge experts who can contribute significantly to research, teaching, and innovations in science and engineering. and are crucial to maintaining and advancing the nation's technological infrastructure and national security while contributing to the economic well-being of society at large.

CHANEL DAVID: *CHANGEMAKER CLASS OF 2021*

Rich Products Corporation's **Chanel David** ('03 BS) was recognized for her innovation, inspiration, and vision by being named to the *Women's Foodservice Forum (WFF) Change Maker Class of 2021*.

The WFF "Change Makers" program helps build a strong pipeline of women leaders identified by their own companies as rising stars within their organizations, while modeling inclusive leadership behaviors that support gender equity within a company's corporate culture.

Ms. David is a Senior Process Development Engineer who has been a longtime volunteer working on behalf of supporting and encouraging young women in engineering.

Class Reunions: 1987 and 1988

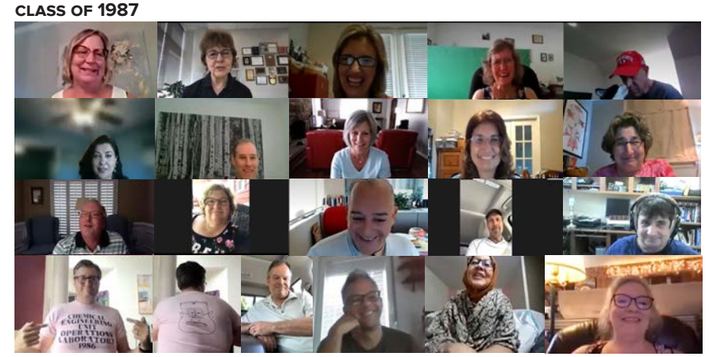
On two different weekends in August, 20201, members of the classes of 1987 and 1988 gathered virtually to renew friendships and relive old times.

Department Chair Umit Ozkan greeted each class and gave a short update about the department and her life. Back in 1987 and 88 when these two classes graduated, Professor Ozkan had only been at Ohio State for two years!

Class members then took turns sharing what they are doing now and what they did since graduation. It was great to hear all of the stories!

Visit the CBE Flickr page for photos from 1987 and the Class of 1988 Reunion held in 2012! go.osu.edu/CBE_Flickr

CLASS OF 1987



CLASS OF 1988

ATTENDEES

Class of 1987 Left to Right
Denise Burcham
Umit Ozkan
Louise Jarvis
Annette Ventura
John Baker
John Baker's cat
Fereshteh Eidgahy
Daniel Hartley
Susan Baker
Kimberly Hoyt
Mary Patacca
Brian Noe
Anne Takacs
Jaime Velez
Craig Hempfling
Ralph Mancik
Robert Tatterson
Timothy Rash
Norlinda Mohd Zawawi
Maureen Visneski
Paul Erdy (camera off)

Class of 1988
Michael Morgan
Umit Ozkan
David Miller
Cathy Pincus
Susan Barnett
Kim Piotrowski
Paula and Wes Oren
Alison Jabbour
Bob Patel
Sue Woodlan
Jill Boughton
Brian Costa
Mark Kinkelaar
Annette Ventura
Ron Villanueva

Professor Ozkan also shared the following:

Alumni Mentoring Network: A new program in CBE has formed to help students on a long-term basis in the form of mentoring relationships. If you would like to help a student or two in this regard, contact Sean Gallagher at gallagher.646@osu.edu. Two alumni from the class of 1988 have already volunteered!

Future Reunions: Alumni who are interested in future reunions (in person or virtual) are encouraged to be proactive and serve as Reunion Class Champions. A "champion" from within the class attracts the greatest number of participants and makes the reunion more successful. Contact Sean Gallagher at gallagher.646@osu.edu if you would like to take up the challenge!

CHRISTINA SISTRUNK:

on LEADERSHIP AND LIFE

> *"I believe leadership is personal. The results you get are the level of leadership you are showing. Look in the mirror and figure out who you need to engage with, and help them be successful, too."*
>
> -Christina Sistrunk, '82

What does it take to be a good leader? If you ask Christina Sistrunk ('82), it takes ... YOU.

Sistrunk is the former President and CEO of Aera Energy LLC, one of California's largest oil and gas producers with 25 percent of the state's production. She was recruited in from Shell, where she had been VP of Production Assets for the Gulf of Mexico, and was known for her skills in revamping organizations based on understanding and leveraging the unique aspects of an organization's culture that make it successful.

Sistrunk began at Amoco. Over a variety of roles, from production engineer, procurement, and construction management, to being responsible for safety as Vice President of Production Assets for Shell Upstream Americas, Sistrunk learned that self-accountability is key. "I kept translating that into different roles, asking how I could make a difference in people's lives," she said.

She came to hold the view that "if the organization isn't delivering the results you are aspiring to deliver, you have to look honestly at yourself. The only thing you can control is how you're showing up."

It was a challenge at times to pivot her thinking, but she became relentless about her responsibilities and opportunities to get a different set of outcomes by working to understand the gaps and what she needed to do to deliver a different level of performance.

For Sistrunk, this also meant being humble enough to reach out to other organizations who were getting good results, to ask for help. "Pride can't get in the way," she said. "Years ago, a mentor said to me, 'Your value for safety has to override your discomfort for anything else.' My people deserve better, and it has to start with me."

Sistrunk's belief in personal accountability extends into another career focus: Safety. It began as a personal concern and expanded.

"When I joined the oil business, I knew very little about the industry," she recalled. "I met my husband on a rig, and his family is the third generation in the industry. So on any given holiday, someone in my family would be working. I wanted to know they would come home safely, and I wanted other families to be treated the same way," she said.

Being head of Environmental, Health, and Safety for Shell's upstream business in North and South America was a huge job. How does one approach it? "Achieving rigorous safety improvements starts with making sure that the company's leadership has a common vision, plus the people who can deliver it, and a culture of accountability to make sure it is delivered," she said.

She built a common set of values around safety by telling people why it was important to her and what she needed from them—accountability and commitment. "You can't write enough rules. You have to build in the capability for people to support one another, be accountable and empower themselves to drive the agenda forward with a sense of ownership," she said.

She also led by example. "If my everyday actions weren't consistent with our common values, then I wasn't doing what was needed to get to the next level," she said.

As an engineer, a key element for Sistrunk is studying the data. "When the team knows and sees the metrics of what to deliver and when, problems solve themselves because people want to win. If they all have the same definition of what winning is, they can go a long way towards resolving issues well ahead of senior leaders. That compounding effect at every level of the organization is what makes visual metrics so powerful," she said.

Sistrunk's efforts yielded stunning results. During a two-year period in her quest to improve safety, injury rates reduced by 60% each year in Shell's Gulf of Mexico operations.

Her passion for safety includes a pragmatic assessment that athe best thing an oil company can do is to keep everything in the pipe. "Safety is of vital importance for people, the environment, and financially, as well," she said. "It matters not just in our lives, but in what kind of world we are turning over to future generations."

Sistrunk's transparent self-accountability isn't a common management theme. It may stem from the self-reflection she undertook when encountering gender discrimination early in her career. "I had not experienced any discrimination at Ohio State, so I was shocked to find out that industry wasn't gender blind. Not everybody was supportive," she said. While gender discrimination still exists, Sistrunk cautions women to not stop at the easy answer. "Self-reflection is an asset, so take the time to assess. Sometimes the problem is someone else, but sometimes it may be how you approached the issue," she said. Look at the data objectively and ask yourself what might be going on, she advises.

Sistrunk believes it is important for women to get out there and create a support network with other women, "but include some men, because both perspectives are needed," she said. She suggests being clear about all life aspects - health, relationships, spiritual wellness, emotional, and career. "Understand what your choices are and why you are making them. Married or not, kids or not; and if kids, who is playing what role. You probably have more choices than you think you have, so you need to make choices congruent with your values," she explained.

"Your definition of success probably is, and needs to be, different than anyone else's. That's how you feel good with the course of your life. Are your choices consistent with your values and goals? That is success," she stated.

Having worked for 38 years, Sistrunk retired in 2020. Looking back, she relishes every minute, and is grateful to Ohio State. "Coming from a small town, and as the first in my family to attend college, I never imagined having the opportunities and life I have had. None of it would have been achievable, had I even made a different choice of school or what to major in," she said.

Throughout her career, Sistrunk found time to volunteer. At Ohio State, she served on the College of Engineering Advisory Committee and the Koffolt National Campaign Committee. She is now looking for new opportunities to volunteer and advise.

She and her husband John are also enjoying catching up on visiting people, working on their new house, and being more active with family.

CBE Career Corner

A sampling of jobs and recent promotions from LinkedIn, showing Chemical Engineering degrees.

Fall 2021

1980s

Cindy Bishop, ’86 BS
President
C. Bishop Law PC
Dallas, TX

Mark Gruber, ’84 MS
Senior Process Engineer
Jacobs Engineering
Cincinnati, OH

Thomas Henry, ’86 BS
Chief Operating Officer
(Co-Founder)
Eunike Ventures
Houston, TX

Kathleen Hogenson, ’82 BS
Independent Director
Verisk Analytics
Houston, TX

Rob Jackson, ’81 BS
Regional Quality Director
Sherwin-Williams
Coraopolis, PA

Kirsten (Petre) McDaniel, ’85 BS
Executive Director & Board of Directors
Youthentity
Carbondale, CO

Johnwei Muljono, ’89 BS
Vice Secretary General
OSU Alumni Assn-Indonesia; Founder, Mondex Logistik Internasional
Jarkarta, Indonesia

Carl Norman, ’83 BS
Manager, Division Engineering Abbott
Columbus, Ohio

Mike Pishkula, ’89 BS
EHS Regional Director – Americas & EMEA
Momentive Performance Materials
Saratoga County, NY

John Sage, ’86 BS
CCO, VP Business Development
Vergent Products
Loveland, CO

Paul Super, ’85 BS
Founder and CEO
Superb Power LLC
Cleveland, OH

Steve Witters, ’82 BS
Patent Attorney
Witters & Associates
La Grange, KY

1990s

Kevin Baker, ’99 BS
Consultant Engineer- Global Automation
Eli Lilly and Company
Indianapolis, IN

Mark Cleary, ’93 BS
Director of Chemical Technology
Boeing Research & Technology
Renton, WA

Mike Davis, ’98 BS
Director, Process Offering
NovaTech Automation
West Chester, OH

Sarah Gregory, ’96 BS
Quality Engineer
Honeywell
Columbus, OH

David Heine, ’97 BS
Research Manager
Corning Incorporated
Steuben County, NY

Edward Legenza, ’98 BS
Batch, Furnace, Lehr & Instrumentation Mgr, Libbey Inc.
Toledo, OH

2000s

Jamal Alawi, ’19 BS
Chemist
PPG Industries
Columbus, OH

Russel Baird, ’06 MS
Director of Manufacturing and Engineering
Femasys
Suwanee, GA

Tanushree (Sinha) Courlas, ’00 BS
Environmental Manager
Ohio EPA
Columbus, Ohio

Daron Ducay, ’04 BS
Senior Engineering Manager
American Regent, Inc.
New Albany, OH

Robert Harman, ’06 BS
Project Engineer
Plus Group of Companies
Cincinnati, OH

Shona (Patel) Mehta, ’03 BS
Associate Director, Global Regulatory Affairs
Merck
Rahway, NJ

Katherine (Wilson) Mitchell, ’09 BS
SSHE Lead - Guyana Futures
ExxonMobil
Houston, TX

Annette (Bryan) Molina, ’04 BS
Downy NA R&D Director
Procter & Gamble
Cincinnati, OH

Lisa Rathburn, ’02 BS
VP Engineering and Continuous Improvement
T. Marzetti Company
Westerville, OH

Shannon Roberts, ’07 BS
Principal, Climate Change and Sustainability Services
Chicago, IL

Gary Seto, ’05 BS
Director of Supply Chain Program Management Office
Abbott
Columbus, OH

Dennis Stoltz, ’09 BS
Process Engineer
Vesuvius USA
Conneaut, OH

Blake Washington, ’09 BS
Large Enterprise Lead Coach
Redzone Production
Decatur, GA

Ling Zhang-Watson, ’03 BS
Sr. R&D Leader, Industrial Solutions & Strategy Leader
Dow, Inc.
Lake Jackson, TX

2010s

Mohammed Alsekhan, ’10 BS
Senior Manager, Olefins Technology Development MEA
SABIC
Jubail, Saudi Arabia

Brandon Collins, ’10 BS
Head Distiller
Taconic Distillery
New York City, NY

Andrea Detwiler, ’14 BS
Pilot Plant Manager
Mars
Chicago, IL

Benjamin Doup, ’14 PhD
Technical Lead
Fauske & Associates, LLC
Chicago, IL

Michael Fontaine, ’13 BS
Senior Research and Development Engineer
Procter & Gamble
Cincinnati, OH

Robert Hoelzle, ’10 BS
Research Fellow
The University of Queensland
Brisbane, Australia

Charles Kiessling, ’11 BS
Senior Project Engineer
Abbott
Columbus, OH

Nicholas Ohanian, ’14 MS
Senior Quality Assurance Engineer
Sunstar Engineering Americas
Springboro, OH

Michael Owens, ’16 MBA
Assistant General Manager
Amazon
West Jefferson, OH

Andrew Pitts, ’10 BS
Senior Engineer
CIL Isotope Separations, Inc.
Xenia, OH

Rayvion Sandford-Pinkins, ’13 BS
AVP Gloabal S&OP
NYX Professional Makeup
El Segundo, CA

Mandy Sheridan, ’12 BS
Senior Principal I Experience Design
Slalom
Chicago, IL

Prateik Singh, ’13 MS
Sr. Manager - Org. Development & Culture
Aster DM Healthcare
Karnataka, India

Kendel Smith, ’13 BS
R&D Leader
Owens Corning
Columbus, OH

Ryan Szczepaniak, ’15 BS
Quality Excellence Manager I
Sherwin-Williams
Strongsville, OH

Emily (Smith) Williams, ’10 BS
Sustainability and Innovation Partnerships Leader
TC Transcontinental
Cincinnati, OH

Binbin Wu, ’13 BS
Hydrogen Operations Engineer
Shell
Los Angeles, CA

2020s

Alex Frank ’20 BS
ADP Process Engineer
Sherwin-Williams
Chicago, IL

Emma Garber ’20 BS
Packaging Engineer
Abbott Nutrition
Columbus, OH

Martin Gonzalez, ’20 BS
Manufacturing Engineering Associate
General Mills
Nashville, TN

Mofopefoluwa Okunade, ’20 BS
Maintenance Engineer
Kroger
Cincinnati, OH

Morgan Smith, ’20 BS
Supply Chain Associate
Frito Lay
Columbus, OH

Emily Song, ’20 BS
Assoc. Manufacturing Science Engineer
Catalent Pharma Solutions
Bloomington, IN

Buckeyes:

Share your news!

Email
Wenda Williamson.416@osu.edu
with your ChE degree(s), title, employer, and city/state!

BOB PATEL:

on SERVICE LEADERSHIP

> *"I think of a job as CEO as being the ultimate job of serving others."*
>
> -Bob Patel, '88

Bob Patel ('88) is passionate about making a difference. Through his visionary leadership as CEO of one of the world's largest plastics, chemicals and refining companies, and his philanthropic efforts, Patel is a champion for helping people realize their potential.

The secret to his success, Patel said, stems from the values he learned as a child. Things like treating others as you want to be treated, helping people and having a strong work ethic. Those lessons were instilled by his mom, who immigrated to the U.S. from India to give Patel and his older brother a better life, and his uncle, who helped bring the family to Cleveland, Ohio.

As a young boy living in India, Patel saw many children who didn't have the resources to get an education. He witnessed the same thing in the U.S., particularly among immigrant families, and saw how his mom struggled to send her boys to college. Those experiences inspired him and his wife, Shital, to pay forward to give young people the opportunity to obtain an education.

Recently, Patel made a generous gift to establish the Bhavesh V. Patel and Family Endowed Scholarship Fund in Engineering at Ohio State. It will provide scholarships to engineering students with financial need, especially first-generation college students and those who live in diverse environments or are active in advancing the needs of historically underrepresented populations.

"I've always believed that education is the best way to unlock potential and build better futures," Patel said. "My wife and I established this endowed scholarship partly because of my very strong affiliation to The Ohio State University, my background and knowing the challenges my mom had in putting us through school. Education opens so many doors and creates so much opportunity."

Supporting children's health issues is also near and dear to the Patels, who experienced the life-changing impact of modern medicine firsthand after their youngest son was born with a liver disease.

"If children have healthy lives and an education, they can realize their potential," Patel explained. "If this scholarship helps someone access a better future, we'll feel good not just about improving one life, but perhaps impacting the lives of the next generation."

Following in the footsteps of his uncle and brother, Patel decided to become a chemical engineer. He chose to attend Ohio State because of its size and reputation, earning his bachelor's in 1988. He also holds an MBA from Temple University.

After graduation Patel held positions of increasing responsibility at Chevron Corporation and Chevron Phillips Chemical Company for more than 20 years. In 2010, he joined LyondellBasell, one of the largest plastics, chemicals and refining companies in the world. Prior to becoming CEO in 2015, he led its olefins and polyolefins business, and manufacturing facilities in the Europe, Asia and International region, as well as its global technology segment.

Leadership through service

If you met him at an event, Patel wouldn't tell you he's the CEO of LyondellBasell. He'd say he works in the chemical industry. Because he believes it's your impact that matters, not your title.

"I think of a job as CEO as being the ultimate job of serving others," he said. "It should be less about yourself."

He applies the same foundational values passed down from his family as he serves LyondellBasell's nearly 20,000 worldwide employees. One of his top priorities is building a corporate culture that feels like a family, one that does so with respect to diversity and inclusion, and with the flexibility employees now expect.

"What I find most rewarding is being able to make employees' lives better and providing a safe, secure work environment," Patel said. "Because I personally believe that if employees are happy then all the other stakeholders' needs get met."

As CEO, he helped advance LyondellBasell's sustainability efforts, which include initiatives to reduce CO2 and help eliminate plastic waste in the environment. Last month the company announced its goal of achieving zero net emissions by 2050 and, as a first step, reducing its emissions footprint by 30% by 2030. He is a founding member and vice-chairman of the Alliance to End Plastic Waste, a cross-value chain alliance launched in 2019 to eliminate plastic waste through increased recovery, recycling and reuse efforts.

"Industries like ours are critical to modern society," he explained. "But we also have a duty as responsible citizens on the planet to find better, more efficient and cleaner ways to contribute."

Under Patel's leadership, LyondellBasell was named to Fortune's "World's Most Admired Companies" list for four consecutive years and to Newsweek's 2021 list of "Most Responsible Companies." The company has expanded its market presence in Asia and has built new production facilities, including the construction of world-scale manufacturing plants in the U.S. Gulf Coast.

Patel has been recognized by his peers who voted him the only two-time recipient of the Independent Commodity Intelligence Services' Kavaler Award, which honors outstanding achievement in the chemical industry.

"I've never sought awards. But I am humbled to think of these honors as recognition as having helped to move the industry on issues that are important to our future," said Patel, who also was honored as a College of Engineering distinguished alumnus in 2015.

He serves on the boards of Halliburton, the Houston Branch of the Federal Reserve Bank of Dallas and the Greater Houston Partnership. Patel is also a member of the Ohio State College of Engineering External Advisory Council, where he shares his expertise to help Buckeye engineers excel.

"When you bring business and academia together, it can be very powerful," Patel said.

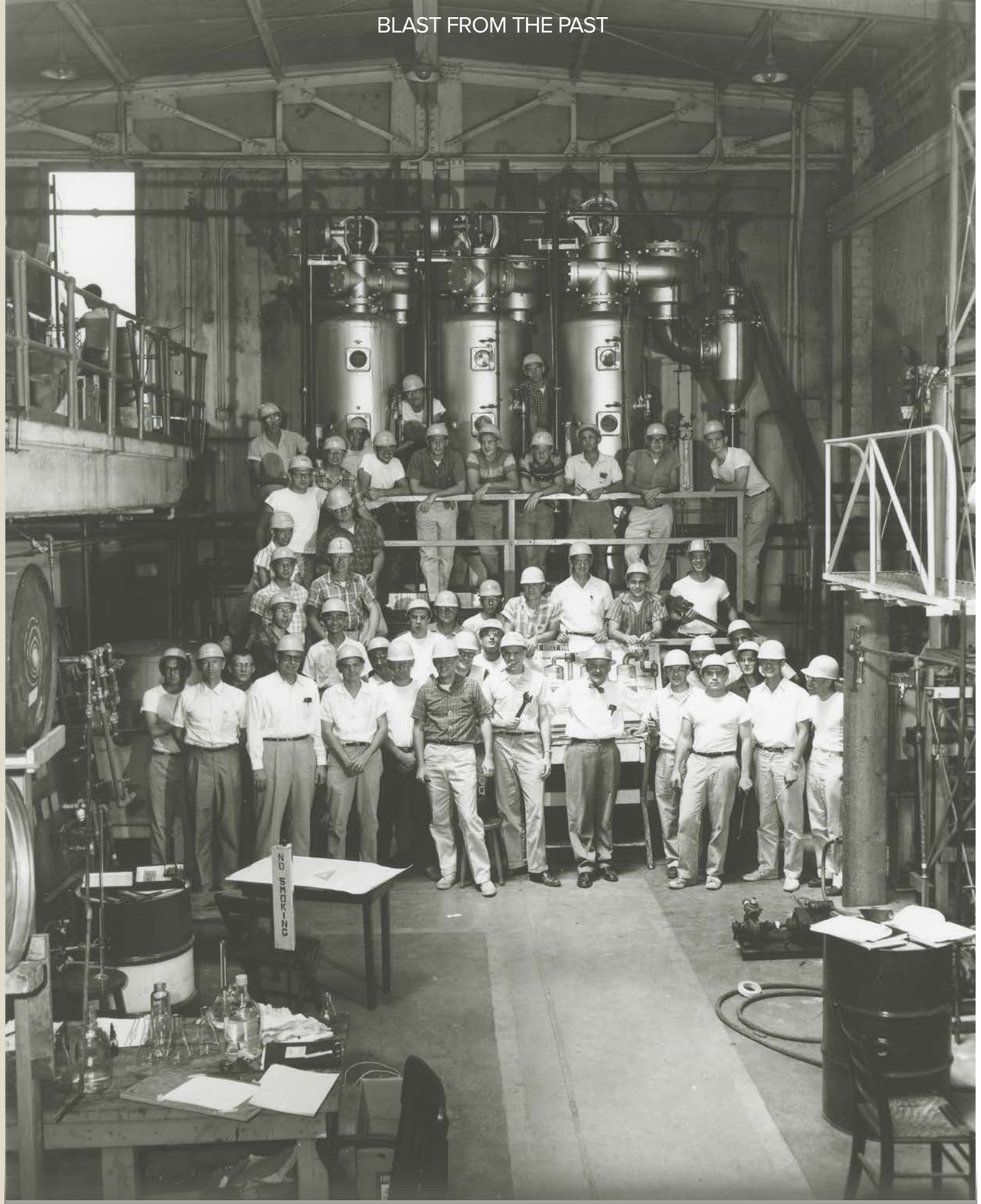
"I enjoy the opportunity to hear about what kind of research is occurring at the university and, in turn, provide views from the business standpoint on best preparing students to succeed in the work world. If that means students can realize their true potential, then it's very motivating."

CEO Bob Patel (right) participates in LyondellBasell's annual Global Safety Day at its Germany location.

Soon Patel will start a new chapter in his career. He will retire from LyondellBasell at the end of the year and become the top executive at W.R. Grace in 2022, where he hopes to continue to make an impact.

"It's not your title that defines who you are. It's your actions and the impact you have," Patel said. "I want to be able to make a difference and that's really what I've focused on throughout my career."

-by Candi Clevenger, College of Engineering Communications



The old, old Unit Operations Lab, complete with the "Triple-Effect Evaporator." Taken in the late 1950s.

In Memoriam

1940s

Kenneth A. Brandstetter, '46 BS, '48 MS, of Cleveland, OH, was a retired General Electric engineer who passed away on 1/4/2017.

Robert L. Brehmer, Jr., '43 BS, former owner of Brehmer Greenhouse in Circleville, OH, died on 1/15/2021.

Loren F. Grandey, '40 BS, of Huntington, CA, passed away on 2/5/2021. Grandey was a retired manager of Unocal Corporation.

Henry Lange, '48 BS, of Augustine, FL, passed away on 9/1/2021 at the age of 96. He had been CEO/Chairman of Cues Inc.

Roy Wallace, '48 BS, passed away on 1/1/2021. He had worked in marketing for Goodyear Tire & Rubber and was living in Kingston Springs, TN.

James C. Wynd, '43 BS, of Groveport, OH, passed away on 1/30/2019. He was a retired engineer who had worked for the State of Ohio.

1950s

Dr. Charles N. Carpenter, '58 BS, '60 MS, '73 PhD, previously a specialist at Pfizer Inc., died on 10/27/2021. He had been living in Hoffman Estates, IL.

Edward J. Onsel, '56 BS, former president of Onsel Brothers Inc. in Mooresville, NC, passed away on 9/15/2019.

Albert E. Ruscilli, '52 BS, '52 MS, of Woodstock, GA, passed away on 9/3/2019. He had been a chemical engineer at Amoco Chemical Corporation.

Dr. Allen M. Rowe, Jr., '56 BS, '56 MS, of Columbus, OH, passed away on 10/7/2020. He was a retired reservoir engineer at BP.

Frank J. Schuh, '56 BS, '56 MS, of Plano, TX, passed away on 12/24/2020. He had been president of Drilling Technology, Inc.

Robert D. Throckmorton, '57 BS, '57 MS, of Dublin, OH, passed away on 6/22/2021. He had retired from Exxon Mobil Corporation.

1960s

Dr. Lynn G. Borchert, '61 BS, a retired physician from Todd, NC, passed away on 7/20/2020.

John W. Mitchell, '66 BS, of Mason, OH, passed away on 2/28/2020. He had retired as a planning manager at Procter & Gamble.

1970s

David R. Grove, '70 BS, '70 MS, previously a director at Eli Lilly & Company, passed away on 3/14/2021. He had been living in Stuart, FL.

FACULTY

AWARDS AND HONORS

Nicholas Brunelli

H.C. 'Slip' Slider Associate Professor Nicholas Brunelli was among 21 faculty members from nine colleges and 18 departments chosen for the Ohio State Office of Research's ***2021 Inaugural Cohort for the Growing Research Opportunities (GRO) Academy.*** The Academy seeks to foster intellectually diverse, collaborative research across academic domains, catalyze new scholarly pursuits, and help generate compelling future funding proposals.

Brunelli was also named a ***2021 Emerging Investigator*** by ***Energy & Fuels***.

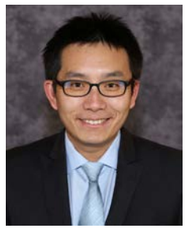
Stuart Cooper

Professor Stuart Cooper was elected to the ***National Academy of Inventors*** in recognition of his valuable inventions in the arena of polymers and tissue engineering that made a tangible impact on the quality of life, economic development, and welfare of society.

Cooper was also named a ***Fellow of Sigma Xi***, one of the oldest and largest scientific organizations in the world. Cooper was Sigma Xi President in 2017-18 and the society since established its fellows program.

Lisa Hall

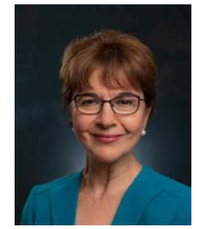
The American Institute of Chemical Engineers recognized Professor Lisa M. Hall with the AIChE Material Engineering & Sciences Division (MESD) ***2021 Owens Corning Early Career Award.*** The award recognizes outstanding independent contributions to the scientific, technological, educational or service areas of materials science and engineering. In announcing the award, the committee cited Hall's research accomplishments and service involvement in AIChE and other organizations as being "truly impressive."



Li-Chiang Lin

Li-Chiang Lin, previously Assistant Professor and now Adjunct Associate Professor, was named to the ***"World's Top 2% of Scientists"*** list *(Elsevier,* both in 2021 and 2020). He also won the ***Alumni Award for Distinguished Teaching***—the highest teaching honor awarded at The Ohio State University—and last year he won the student-nominated College of Engineering *Charles E. MacQuigg Award for Outstanding Teaching*.

In yet other honors, Lin had a paper published in the special ***AIChE Futures*** issue, and was named to Industrial & Engineering Chemistry Research's (I&EC) ***2021 Class of Influential Researchers-The Americas.*** Earlier in 2021, he was chosen as an ***Early Career Editorial Board Member*** for the Elsevier journal, ***Separation and Purification Technology.***



Umit Ozkan

College of Engineering Distinguished Professor and Department Chair Umit S. Ozkan officially received the additional honorific title of ***Distinguished University Professor***, the highest faculty honor at The Ohio State University. Executive Vice President and Provost Melissa L. Gilliam presided over the event, during which President Kristina M. Johnson presented Ozkan with the Distinguished University Professor medal.

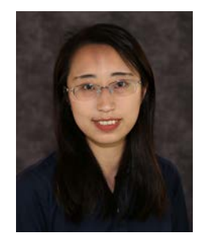
Andre Palmer

Ohio Eminent Scholar and Professor Andre Palmer was named ***Associate Dean for Research in the College of Engineering.***

Palmer also received the ***2021 Gaden Award*** from the journal ***Biotechnology & Bioengineering*** (Wiley). The award is given to an exceptional paper published in the Journal within the last few years. Former grad students **Donald A. Belcher** ('19 PhD) and **Richard Hickey** ('21 PhD) are co-authors, as is former undergrad **Ivan S. Pires** ('19 BS) who is now pursuing a doctorate in chemical engineering at MIT.

Katelyn Swindle-Reilly

Assistant Professor Katelyn Swindle-Reilly was elected ***Chair, Ophthalmic Biomaterials Special Interest Group*** for the Society of Biomaterials (2021-23) and ***Communications Chair*** for the Ocular Delivery (OcD) Focus Group of the Controlled Release Society (CRS). She spoke at a Congressional Briefing in the Alliance for Eye and Vision Research (AEVR) and Association for Research in Vision and Ophthalmology's "A Conversation: Moving beyond Covid-19 in my career," and gave a 5-minute interview as part of ***AEVR's 7th Annual Emerging Vision Scientists Day*** on Capitol Hill during International Age-Related Macular Degeneration Awareness Week 2021.



Xiaoxue Wang

Assistant Professor Xiaoxue Wang, who joined CBE in 2019, is making headway with her AI and machine learning research to fabricate the design and chemical synthesis of drug-like organic molecules and advanced electronic devices and materials. In addition to publishing 21 peer-reviewed articles to date and filing two US patents, the MIT alumna was recently chosen as one of 35 recipients of the ***Ralph E. Powe Junior Faculty Enhancement Award*** by the Oak Ridge Associated Universities (ORAU) Consortium from 156 applications and 89 member institutions.

Jessica Winter

Professor Jessica Winter was named a ***Fellow*** of the American Institute of Chemical Engineers, the Biomedical Engineering Society (BMES), and the internationally-renowned Royal Society of Chemistry (RSC), all in the same year!

Winter was also featured in a July 7, 2021 BBC podcast, ***The Compass***. Twenty minutes in, Winter describes applications of gold nanoparticles in healthcare, such as using nanogold as part of pregnancy tests and as part of a protocol to treat cancer. Listen here: https://www.bbc.co.uk/sounds/play/w3ct2g7n

RESEARCH: Transforming 'sewer gas' into clean hydrogen fuel

FROM THE L.-S. FAN CLEAN ENERGY RESEARCH LABORATORY

Distinguished University Professor and C.John Easton Professor L.-S. Fan

A toxic gas becomes a clean-burning fuel by adding molybdenum to break the gas into separate elements

Scientists have found a new chemical process to turn a stinky, toxic gas into a clean-burning fuel.

The process, which was featured on NBC4i news and detailed in the American Chemical Society journal ***Sustainable Chemical Engineering***, turns hydrogen sulfide – more commonly called "sewer gas" – into hydrogen fuel. Hydrogen sulfide is emitted from manure piles and sewer pipes and is a key byproduct of industrial activities including refining oil and gas, producing paper and mining.

The process detailed in this study uses relatively little energy and a relatively cheap material – the chemical iron sulfide with a trace amount of molybdenum as an additive. In addition to smelling like rotten eggs, hydrogen sulfide is highly toxic, corroding pipes and harming the health of people who encounter it.

Lang Qin

"Hydrogen sulfide is one of the most harmful gases in industry and to the environment," said **Lang Qin**, a co-author on the study and a research associate in chemical and biomolecular engineering at The Ohio State University. "And because the gas is so harmful, a number of researchers want to turn hydrogen sulfide into something that is not so harmful, preferably valuable."

The study builds on previous work by the same team using chemical looping, which involves adding metal oxide particles in high-pressure reactors to burn fuels without direct contact between air and fuel. The team first used chemical looping on coal and shale gas to convert fossil fuels into electricity without emitting carbon dioxide into the atmosphere. The initial process used iron oxide to break down the fossil fuels.

The researchers later applied the concept to hydrogen sulfide and invented the SULGEN process, which converts hydrogen sulfide into hydrogen. The researchers found that the pure chemical, iron sulfide, didn't perform well at the large scales needed for industrial use, Qin said. The research team has been trying to identify other inexpensive chemicals that could catalyze that transformation in higher quantities. This study shows that introducing a trace amount of molybdenum into iron sulfide might be an attractive option.

That material is relatively inexpensive and easy to acquire, making it an attractive option for larger-scale operations. Transforming this toxic gas into hydrogen fuel creates an alternative oil and gas, which are major contributors to climate change, the researchers said.

Kalyani Jangam

"It is too soon to tell if our research can replace any of the hydrogen fuel production technologies that are out there," said **Kalyani Jangam**, lead author of the study and a graduate student in Ohio State's Clean Energy Research Laboratory. "But what we are doing is adjusting this decomposition process and making a valuable product from that."

For this study, the researchers found that molybdenum improves the breakdown of hydrogen sulfide, splitting it into two parts – hydrogen fuel and sulfur.

This work is early in the scientific process – the researchers showed that the process worked in the lab; tests at the industrial level are forthcoming.

"The big picture is we want to solve the harmful gas issue, and we thought that our chemical looping process would allow that," Qin said. "And here, we have found a way to do it in the lab that creates this value-added hydrogen fuel.

The research also appeared in the science news outlets GreenCarCongress.com, SciTechDaily.com, and AzoCleanTech.com. The senior author on this paper is **Liang-Shih Fan**, Distinguished University Professor/C J Easton Professor, Chemical and Biomolecular Engineering at Ohio State. **Yu-Yen Chen**, a former doctoral student in Fan's laboratory, also contributed.

-Based on a story by Laura Arenschield, Ohio State News

Recent funding successes

Andre Palmer

In an incredible achievement, Ohio Eminent Scholar and Professor Andre Palmer won four new NIH RO1 awards. The funding supports the bioengineering of a therapeutic protein complex to detoxify heme and hemoglobin ($2.6M); detoxify hemolysis byproducts in genetic and acquired anemias ($2.5M) and in cardiopulmonary bypass circuits ($2.6M); and to engineer a novel biomaterial for oxygen transport applications ($2.7M).

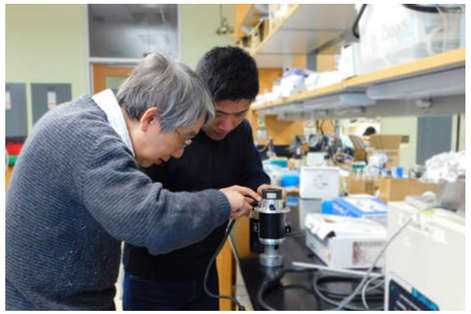
Jessica Winter, Nicholas Brunelli, Barbara Wyslouzil

With the support of a $700k+ NSF grant, Professors Winter, Brunelli and Wyslouzil will aim to scale up a continuous-synthesis method of inorganic nanoparticle production via jet mixing reactor nanomanufacturing. The research will focus on developing a scalable nanomanufacturing process for catalyst and semiconductor quantum dots as model systems. The engineers are targeting applications such as health care, where the quality and uniformity of the nanoparticles is critical.

S.-T. Yang

A team led by Professor Shang-Tian Yang received a $1.6 million award from the U.S. Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) to develop engineered microbial consortia for advanced and efficient biofuel production from renewable biomass with higher product yields and zero CO_2 emissions.

The award will enable Yang's team to take their potentially game-changing biobutanol production method to the next level.



GRADUATE PROGRAM

2021 Graduate Research Symposium offers new ideas, networking

The 10th Annual Graduate Research Symposium, held on October 1, 2021 and sponsored by Dow Chemical, was a standout event. Approximately 50 people attended virtually to enjoy a keynote, live and pre-recorded poster presentations, networking, and an awards ceremony.

Guests included representatives from Atilim University (Turkey), Baker Hughes, BASF, Dow, Eli Lilly, Ohio State's Technology Commercialization Office, Forge Biologics, Kenexis, LyondellBasell, Modality Solutions, the National Renewable Energy Laboratory, Netswitch Technologies, Procter & Gamble, StrateNexus Technologies and the University of South Florida.

Keynote speaker Dr. **Diane Traub Hooie** ('74 Ceramic Engineering) shared insights gleaned from her 40 years of experience in developing and commercializing new ideas and innovative clean energy technology, mostly at the Department of Energy (DOE)'s National Energy Technology Laboratory (NETL), where she developed and coordinated programs in clean energy areas including clean coal, turbines, fuel cells, hybrid energy and clean fuels both within the US and internationally.

Dr. Hooie was proactive in her work, always identifying needs and solutions in terms of what would benefit her employer and employees. Throughout her career, she actively encouraged women to enter into STEM fields and was selected Woman of the Year and Person of Distinction for the Federal Government in 1998.

She discussed the difference in male and female leadership styles."Women do have different styles in how we play the game," she said. "Women tend to be harsher with themselves and take things more personally. Growing up, women learn to 'play nice,' and if you had an argument, you didn't talk afterwards, whereas men could play football, beat each other up, and then go have a beer. Women expect to get their fair share, but men will fight harder for it and are more cut-throat about it," she said. "Women get different results, and everyone brings something to the table," she said. "We're now seeing more men adapt to the styles of women."

Retired LyondellBasell Executive Vice President **Dan Coombs** ('78 BS) referred to a study on team dynamics done by ***Harvard Business Review***. "Consistently, teams with at least one woman on the team outperformed teams with no women. The more women, the better the performance. Women brought a different viewpoint and helped the team think broader and bigger. Also, teams with an 'expert' actually did worse. People would defer to the expert instead of exploring a problem together," he said. [Reference: go.osu.edu/HBR-teams June 2011]

The study also showed that teams need a moderate level of cognitive diversity for effectiveness. Extremely homogeneous groups or extremely diverse groups aren't as intelligent, the twice-replicated study found. Hooie and other leaders acknowledge the importance of including women and minorities in teams, and said that unfortunately, it was sometimes hard to retain them. "We tried to prevent it, but could not determine the root cause," she said.

Edward Marszal ('92 BS), a scientific advisory board member for Purdue University's Process Safety and Assurance Center, asked Hooie if she thought that converting wind and solar energy to hydrogen and using it in turbines or fuel cells could quickly overcome energy-storing battery systems, which lack safety.

Hooie said the problem right now was not having the infrastructure, such as hydrogen pumps, to support fuel cells. "Also, you have to look at your energy consumption from Well to Wheel–the whole process," she said. "An electric car's 'clean' energy still has to be tagged to power plant emissions—that energy doesn't come out of nowhere," she said.

When Hooie finally decided to retire, she did so to make room for young people who were frustrated at the lack of opportunities. In replacing her, the DOE promoted three people from within.

"I met my goal of making a difference, and I hope all of you here today will do so, as well," Hooie said.

2021 GRS Presentation Winners

THANK YOU, GRS COMMITTEE!

An event like the Graduate Research Symposium takes a lot of planning and coordination. We would like to thank the members of this year's GRS Planning Committee: **Sai Vivek Prabhala** (Chair), **Dishari Basu** (Former Chair/Advisor), **Pinak Mohapatra** and **Faiz Khan** (Abstract Book), **Akshay Kudva** (Gifts/Certificates), **Rushikesh Joshi** (Judging), **Snehal Patil** and **Ashin Antony Sunny** (Outreach), **Sonu Kumar** (Zoom), and **Shraavya Rao** (Website).

GRADUATE PROGRAM

AWARDS AND HONORS

National Awards

Megan Allyn (Advisors: Swindle-Reilly/Palmer) won a *2021 Prevent Blindness Research Fellowship Award* to assess novel therapeutics and extended release systems for age-related macular degeneration

Nick Chi-Ling Chiang (Advisor: Lee) received the *Outstanding Post-Doctoral Student,* American Institute of Chemists Award

In the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers' (NOBCChE) first annual Collaborative Research Poster Competition, **Jonathan Hightower** (Asthagiri Group), won *Best Poster Award.*

Anagha Hunoor (Ozkan Group) won an *AIChE Catalysis and Reaction Engineering Division 2021 Travel Award* to present her paper "On the dual-role of the reactant during aqueous-phase hydrodechlorination of tri-chloroethylene using Pd catalysts supported on swellable organically modified silica (SOMS)" at the 2021 AIChE Annual Meeting in Boston this November.

Anuj Joshi (Fan Group) earned 3rd prize in the *Student Presentation Award Competition* (SPAC) held by the American Chemical Society's (ACS) Energy and Fuels Division (ENFL) at the ACS Fall 2021 meeting. His subject is a novel redox process for efficient decomposition of hydrogen sulfide into hydrogen that not only produces valuable hydrogen, but also utilizes carbon dioxide as a sweep gas for carrier regeneration, which eliminates the need for an air separation unit.

Faiz Khan (Winter Group), who won *First Place, Engineering Poster Presentation* at the 2021 Hayes Graduate Research Forum, topped out again with a first-place win at the American Chemical Society (ACS) Indiana Local Section's *PREDICT 2021 Graduate Student Lightning Talk Contest.*

Dongjoon Kim (Asthagiri Group) won 4 awards: the *KSEA-KUSCO Graduate Award* from the Korean-American Scientists and Engineers Association, and from The Ohio State University, the *Ray Travel Award for Scholarship and Service* (Council of Graduate Students); the *International Leadership Scholarship* (Office of International Affairs); and his leadership as founder and president of the Korean Graduate Student Association resulted in the group winning the *Outstanding New Student Organization Award* (Office of Student Life).

Tong Sun (Wyslouzil Group) won an award for her exceptional presentation in the Physical Chemistry and Spectroscopy session at the June 2021 American Chemical Society Great Lakes Regional Meeting.

Changlong Zou (Ho Group) won the American Institute of Chemists Award for Outstanding Graduate Student.

Local Awards

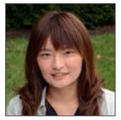
CBE DEPARTMENT AWARDS

CBE Post-Doctoral Award:

Jianhua Pan

CBE Outstanding Graduate Student Awards:

Michael Charles



Ting-Yu Chen

Yu-Yen Chen

Archit Datar

Andrew Deng

Vance Gustin

Yan Liu

Vedant Shah

First in Safety

In the latest University-wide recognition of CBE's efforts to keep CBE and the College of Engineering at large safe, our graduate-student-run **Chemical Hygiene Committee (ChyComm)** won the University Laboratory Safety Committee's *2021 Group Excellence in Safety Award.*

Congratulations **Richard Hickey** and **Kayane Dingilian** (now PhDs!), **Elizabeth Jergens** and **Vance Gustin**!

Your outstanding efforts to facilitate and ensure safety within our building and College are vital and much appreciated.

Recognizing Excellence at Ohio State

UNDERGRADUATE PROGRAM

Columbus hosts 2021 AIChE North Central Regional Conference

The Ohio State AIChE Student Chapter had a rare opportunity to host the 2021 AIChE North Central Regional Conference this year. Held virtually, it was a fun, well-orchestrated event resulting from intense planning, most of which was done in less than a single semester due to last-minute rule changes.

"We were glad to step up to host the conference, even though we didn't get to do it in person like we'd originally planned," said AIChE President Matt Greenwaldt. "It was an incredible effort on the part of the planning team, led by Bryce Pember. I'm very proud of him and the team for adapting so well to the change in circumstances."

Department Chair Umit Ozkan agreed. "It was a fantastic event. Our students did a phenomenal job!" she said.

Nearly 200 students from our department and 28 other schools in the North Central Region signed up. To increase camaraderie, Zoom was used in creative ways to host ice-breaker coffee socials and networking "happy hours," with effective results. Even the ChemE Car Competition was held by Zoom. Participants livestreamed their respective car runs at their home schools.

Bob Patel (BS '88), CEO of LyondellBasell, gave an inspiring keynote. Patel told his story, gave tips on how to improve as a professional in the industry, and discussed the sustainability solutions that LyondellBasell is working on to improve the science behind, and awareness of, plastics circularity.

Other featured events included the traditional ChemE Car race; Technical and Poster Competitions; games like ChemE Jeopardy; a Career Fair; Grad School Panel; and workshops.

The event concluded with an Awards Banquet, raffle, and the opportunity to purchase conference apparel or gift cards.

Workshops

- Start-Ups: **Paul Matter** (BS '01, PhD '06), founder of Columbus-based materials and energy storage company pH Matter talked about what it's like to create a start-up, what the fuel cell industry is like, and where his company fits within that industry.
- Refining 101: Marathon Petroleum Corporation
- Starting, Operating and Improving a Chapter Mentorship Program: Ohio State's AIChE Chapter President Matthew Greenwaldt
- Integrating Chemical Engineering with Business: Dow Chemical Company Representative **Matthew Rees** (BS '17)
- Solving Plastic Pollution: Representatives from Alterra Energy, which transforms waste plastic into usable products, showed how they reduce plastic waste.
- Process Safety: Process Improvement Institute's **Jeff Thomas** (BS '76); how to develop safety skills that recruiters like to see.
- A Future in Pharmaceuticals: Consultant **Leonore Witchey-Lakshmanan** (BS '83, MS '84), spoke about the benefits of working in the industry and how to get there.
- Humanitarian Engineering: Miami University professor Catherine Almquist
- Financial Responsibility and Wellness: **Andrew Maxson** (PhD '17)
- Pathway to Management: Aera Energy LLC President and CEO **Christina Sistrunk** (BS '82)
- Working in the Food Industry: Smucker's VP of Research & Development **Jim Trout** (BS '92)
- How to Host a Networking Night: AIChE External Vice President **Ben Carpenter** and former AIChE Professional Development Coordinator **Anjali Tewari.**

Several workshop hosts and guests contributed financially to the conference. An extra thank-you to **Hexion, Marathon, Alterra Energy, Lincoln Electric, and pH Matter**!

OHIO STATE AICHE CONFERENCE PLANNING COMMITTEE: THANK YOU!

The 2021 Regional Conference all happened thanks to **Bryce Pember** (Chair), **Matt Greenwaldt** (AIChE President), **Maria Belicak**, **Michael Camburn**, **Ben Carpenter**, **Tyler Dorcon**, **Judy Garzanich**, **Abby Hallock**, **Quent Hartt**, **Lauren Kinsey**, **Mario Lucrezi**, **Zane Mohammad**, **Antara Rath**, **Jack Thomas**, **Lilly Vagedes**, and **Jessica Whitman**.

AWARDS AND HONORS

National Awards

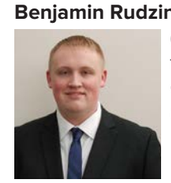
Nick Krammer, who minored in nuclear engineering, received a scholarship in the Department of Energy's *Nuclear Engineering University Program (NEUP).*

Krammer began working as a student assistant for the Ohio Emergency Management Agency's Radiological Division in the fall of 2020. His work involved calibrating dosimeters and decommissioning obsolete Geiger Counters. He gained more experience at Ohio State's Nuclear Reactor Lab before joining the Nuclear Analysis and Radiation Sensor Lab (NARS).

"I am very thankful for this scholarship, and it really shows how supportive my engineering professors have been in my undergraduate studies with the opportunities they've provided," Krammer said.

The scholarship will allow Krammer to dedicate his time to nuclear research during his final undergraduate semester and help provide more opportunities to explore nuclear research and engineering, which he became interested in while exploring carbon-free energy options. During this research, he discovered that nuclear energy, while contributing to national security by providing a domestic, diversified energy source, is also a complement to wind, solar and energy storage in the effort to reduce our carbon footprint.

Benjamin Rudzinski

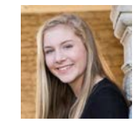


(Ozkan Group) received the American Institute of Chemists Award, *Outstanding Undergraduate Student.*

Ohio State's undergraduate chemical engineering program was ranked #23 in the nation in ***US News & World Report's 2022 Best Colleges*** Issue!

Local Awards

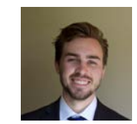
AICHE CENTRAL OHIO CHAPTER AWARDS



Othmer Academic Excellence:
Lauren Ulland

Outstanding Student Award:
Sam Johnstone

CBE DEPARTMENT AWARDS



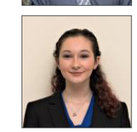
Patents and Publishing:
Kane Jacobs

Outstanding Research:
Yingjie Shi

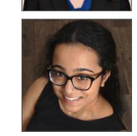
COLLEGE OF ENGINEERING UG RESEARCH FORUM
First Place, Chemical Engineering: **Jacob Fillinger**

AICHE STUDENT CHAPTER AWARDS

Outstanding Support of Undergraduate Education:
Sam Johnstone



Exemplary Service Award:
Judy Garzanich



Community Outreach Award:
Anjali Tewari

SOCIETY OF WOMEN ENGINEERS

2021 WE Local Guiding Star Award:
Amanda Slager ('21)

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COLLEGE OF ENGINEERING

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