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Message from the Chair

Dear Alumni and Friends,

Emerging from one of the most challenging winters in memory, I am greeted by pink blossoms and the lovely fresh scents of spring air on a renewed campus. It is good to be back.

Exciting things continue to happen for us. Most notably, we have a new dean! After ten years of unprecedented growth led by Dr. David B. Williams, acclaimed roboticist Dr. Ayanna Howard takes the helm. We are thrilled to have attracted someone of her caliber and are invigorated by her insights and experiences as women in a still-male-dominated field. Not to be outdone, our faculty have also been active on multiple fronts.

Alumni have been busy as usual, winning awards (Mike Winfield, Elif Miskioglu, Boris Patel & Co., T.J. Gosh, Jess Tufte) and honors (Aisha Barry, Alissa Park). They are also active in innovative research (Paul Matter) learning how to climb the business ladder (Musa Alharoon), reflecting on the “Koffolt Years” (John Rapach), and sharing their insights and experiences as women in a still-male-dominated field (Sara Imwalle).

Not to be outdone, our faculty have also been active on multiple fronts. Bhavik Bakshi, L.-S. Fan, and Lisa Hall each won major national awards/publication honors. A significant number of faculty and alumni participated in activities and research addressing the Covid-19 crisis (alum Dan Littlefield & Co., and faculty John Clay, Li-Chiang Lin, L. James Lee, Joel Paulson, Eduardo Reátegui, and William Wang). And several faculty (L.-S. Fan, Winston Ho, David Wood, and Jessica Winter) are making progress on the commercialization of their technology.

Last but not least, our students have demonstrated a breadth of talents. Undergraduate Anjali Tewari won all three Student Life Leadership Awards, while several grad students earned national publishing honors and travel awards.

All told, it is an amazing cluster of achievements, and I couldn’t be more proud of our CBE family.

Take good care and keep in touch, and don’t forget to update us with news from your own lives!

Umit S. Ozkan
Distinguished University Professor and Chair

Faculty

Aravind Ashagirii, Professor and Associate Chair
Bhavik Bakshi, Richard M. Morrow Endowed Chair / Professor
Nicholas Brunelli, H.C. Slip Slider Associate Professor
Jeffrey Chalmers, Professor
John Clay, Professor of Practice
Stuart Cooper, Distinguished Professor
Paul Dubetz, Adjunct Assistant Professor
Iliam El-Monier, Assistant Professor of Practice
Liang-Shih Fan, Distinguished University Professor / C. John Easton Professor
Lisa Hall, Associate Professor
Winston Ho, Distinguished Professor of Engineering
Kurt Koelling, Professor
Isamu Kusaka, Associate Professor
Li-Chiang Lin, Umit S. Ozkan Assistant Professor
Andrew Maxson, Assistant Professor of Practice
Umit Ozkan, COE Distinguished Professor / Chair and Distinguished University Professor
Andre Palmer, Ohio Eminent Scholar and Professor
Joel Paulson, Assistant Professor
James Rathman, Professor
Eduardo Reátegui, Assistant Professor
Katelyn Swindle-Reilly, Assistant Professor
David Tomasko, Associate Dean, Undergraduate Education and Services / Professor
Andrew Tong, Assistant Professor of Practice / Research Assistant Professor
William Xiaoguang Wang, Assistant Professor
Xiaoxue Wang, Assistant Professor
Jessica Winter, Professor
David Wood, Professor
Barbara Wyslouzil, Professor
Shang-Tian Yang, Professor

Emeritus Faculty

Robert Brodey
Martin Fenner
Morton Friedman
Edwin Haering
Larry Hershey
L. James Lee, Helen C. Kurtz Chair Emeritus
Michael Paulaitis
Thomas Sweeney

Students

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News

Alumni

Faculty

Research Assistant Professor
Andrew Tong, Assistant Professor of Practice /

Liang-Shih Fan, Distinguished University Professor /

Ilham El-Monier, Assistant Professor of Practice

Liang-Shih Fan, Distinguished University Professor / Professor

Paul Dubetz, Adjunct Assistant Professor

John Clay, Professor of Practice

Stuart Cooper, Distinguished Professor

Winston Ho, Distinguished Professor of Engineering

Umit S. Ozkan, COE Distinguished Professor / Chair

Isamu Kusaka, Associate Professor

Andrew Maxson, Assistant Professor of Practice

William Xiaoguang Wang, Assistant Professor

Xiaoxue Wang, Assistant Professor

Jessica Winter, Professor

David Wood, Professor

Barbara Wyslouzil, Professor

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Contact Sean at 614-688-2153 or email gallagher.646@osu.edu to learn more. Thank you for supporting your CBE!
Ayanna Howard Named COE Dean

Sitting in his wheelchair with a robot-equipped stuffed animal on his lap, the boy beamed when he realized his movements, as taxing as they were, caused a character in the game to react. He was in control. It was a gift — for the boy with cerebral palsy and for Ayanna Howard. “At that moment, I realized we were doing the right thing,” she said.

Howard, who traces her devotion to engineering to a childhood fascination with the TV show “Bionic Woman,” is the new dean of Ohio State’s College of Engineering.

“I was a total science fiction nut, so anything that flew, had robots or superheroes, I was there,” “I was a total science fiction nut, so anything that flew, had robots or superheroes, I was there,” she explained. And what was once the premise of a sci-fi TV show is now the life’s work of an accomplished roboticist and educator.

Howard’s career spans higher education, NASA and the private sector. Most recently chair of Georgia Institute of Technology’s School of Interactive Computing and founder/director of the Human-Automation Systems Lab (HumAnS), she is also an entrepreneur whose company, Zyrobotics, develops robots to help children with special needs achieve educational and therapy goals.

She founded her company, Zyroboitcs, in 2013, based on a patent for a device that could enable children with disabilities to interact with tablets. Now a nonprofit, Zyrobotics continues to develop products for children with special needs, based on Dr. Howard’s research.

Howard’s research is centered around the concept of humanized intelligence; the process of embedding human cognitive capability into the control path of automated systems. Her Georgia Tech HumAnS Lab focuses on humanized intelligence, using techniques such as sensing and learning to enhance the autonomous capabilities of robots or other computerized systems. The HumAnS Lab has generated more than 250 publications and $8.5 million in principal investigator-led research funding.

Most recently, Howard authored “Sex, Race, and Robots-How to be Human in the Age of AI,” which describes how racial and sexual biases are creeping into society’s AI-powered systems, and the danger that presents.

Earlier in her career, Howard worked in NASA’s Jet Propulsion Laboratory, where she held multiple roles, including senior robotics researcher and deputy manager in the Office of the Chief Scientist. She was involved in developing SmartNav—an autonomous, next-generation Mars rover—and SnoMotes, toy-sized robots that can explore icy terrain that is too dangerous for humans to enter.

“I believe that every engineer has a responsibility to make the world a better place. We are gifted with an amazing power to take people’s wishes and make them a reality.”

-Dr. Ayanna Howard

Howard is a vocal proponent of “convergent research.” She describes it as “interesting solutions happening at the intersection of disciplines.”

“The hard problems we face as humans exist at the interface, the intersection of multiple disciplines. There are problems no one has ever found a solution to because the right researchers weren’t in the room to really think about them in different ways. Engineers are driven by exploration, we’re driven by knowledge—and convergent research provides both,” she said.

“I’ve stayed in academia because I love being challenged by new knowledge. For example, the company I started is the convergence of robotics, artificial intelligence, clinical therapy, science interventions and early education. Those intersections have enabled us to develop interactive STEM games and learning tools that adapt to each child’s capabilities,” she added.

Among many accolades, Forbes named Dr. Howard to its America’s Top 50 Women In Tech list. Recently, she became an Institute of Electrical & Electronics Engineers (IEEE) Fellow for her contributions to human-robot interaction systems, and was a Champion Award recipient of Silicon Valley Robotics Industry’s inaugural Good Robot Industry Awards. In addition, she is included in Cell Mentor’s list of “1,000 Inspiring Black Scientists in America.”

“Community and inclusive excellence around students, research, and innovation are my passions,” said Howard. “I’m of the belief that it takes a village to drive excellence, and my goal is to fully support us in that effort.”

Executive Vice President and Provost Bruce A. McPheron noted that Dean Howard joins Ohio State amid substantial university investments in the advanced materials corridor, interdisciplinary research and the West Campus Innovation District.

A recently-announced $100 million State of Ohio investment in the Innovation District will increase convergent research initiatives, substantially grow the number of STEM graduates, and design more opportunities for engineering students to engage with industry partners.

Williams, who led the College’s unprecedented growth over the last decade.

“I’m thrilled to join Ohio State at a time in which there is so much potential to strengthen and build new partnerships in order to expand access and enhance opportunities for the next generation of students, alumni, and for economic development throughout Ohio,” said Dr. Howard.

“Dr. Howard is an innovator whose skills and passion are a perfect fit with Ohio State’s focus on convergent research and discovery,” said President Kristina M. Johnson. “To attract a leader of her caliber shows both the strength of our university’s overall research mission.”

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During her work with Zyrobotics, Dr. Howard discovered a passion for teaching. This led her to returning to Ohio State, where she has become the first woman to serve as dean.

Throughout her career, Howard has been active in helping to diversify the engineering profession for women, underrepresented minorities, and individuals with disabilities.

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Mike Winfield receives Service to Students Award

Michael D. Winfield, ’62, was selected for The College of Engineering 2021 Dean’s Meritorious Service to Students Award for over 45 years of demonstrated commitment to student success. As an alumnus, Winfield has shown remarkable dedication, helping students in multiple ways.

Early in his 37-year career at Universal Oil Products (now Honeywell UOP), Winfield led its student recruitment efforts, bridging research collaborations between UOP and Ohio State to support the graduate programs at the university that align with the research programs at UOP. He personally organized internship programs and directly recruited, supervised, and mentored many students, even as he took on the demanding role of President and CEO of UOP. Over his tenure, 15 of these students were hired into successful careers. One became the head of UOP’s research program, and another with 107 patents helped commercialize numerous impactful technologies. Still another became the head of sales and marketing for the western hemisphere, and a fourth VP of manufacturing.

Winfield has enjoyed mentoring students in the classroom as well. For a great many years, he guest lectured in CBE’s Senior Design course, discussing various applications of chemical engineering principles in industry and offering seasoned advice on a wide range of topics that help students prepare for their careers. Amidst a demanding, challenging curriculum and facing an uncertain future following graduation, students greatly appreciated these kind words of support.

Winfield also lent his business talents to the university on behalf of students. He has served on CBE’s Advisory Board since its inception and is a current member of the College of Engineering External Advisory Council. in 2008 he commenced service as vice chair of CBE’s New Koffolt Labs Committee, working hand in hand with board chair William G. Lowrie. As vice chair, Winfield drew on his industry background and business acumen in the ten-year effort to fulfill the dream of a new chemical engineering building, which represents the single, greatest investment in the success of this department’s students over the last decade. Winfield’s contributions in leadership, planning, organizing, and fundraising were critical factors in making it a reality.

Winfield has not only selflessly dedicated time and effort on behalf of students—he also invested his own funds. In 2003, Mike and his wife, Arlene, created the Michael D. Winfield Chemical Engineering Endowment Fund, which has helped many students go on to make their own contributions to society.

Years ago, Professor Joe Koffolt established a fundamental principle in the chemical engineering department—students come first, because they are the “jewels” of the department. Mike has held true to the principles of our most-admired department professor and one whom Mike attributes much of his success to. Michael Winfield is a jewel who shines from both his successful accomplishments at UOP and his selfless commitment to the well-being of this university.
Ah-Hyung Alissa Park
Modality Solutions
Bhavesh V. (Bob) Patel
cbe.osu.edu

Corporation Board of Directors. Earlier this year, Barry was appointed to the Kaman Corporation (NYSE: FTV) named Aisha Barry ('95 BS) president of the company.

Previously, she was vice president and general manager for the Patient Monitoring category at Philips, and before that, vice president and general manager of Patient Management Software for Medtronic.

Crucial Work at a Critical Time
Biopharmaceutical cold chain engineering firm Modality Solutions, owned by Dan Littlefield ('86 BS, '88 MS) and recently featured on the Today Show, has worked over the last six months to support the distribution of COVID-19 vaccines and therapies, conducting transport simulation testing on almost one-half of these life-saving drugs.

"I was happy and honored to be one of the many people working hard to ensure safe and effective Covid-19 vaccine distribution," said Kelsey Crawford ('18).

Elif Miskioglu

AIChe’s “35 Under 35”
Outcomes are better when people with diverse expertise, backgrounds and perspectives are brought to problem-solving. AIChe has recognized the work of Bucknell University’s Assistant Professor Elif Miskioglu ('15 MS/PhD) in this regard by naming her to its “2020 35 Under 35” list.

Professor Miskioglu works to help future engineers surmount societal challenges, promoting greater inclusivity.

She researches the development of engineering expertise, with a specific focus on the construct of intuition and its role in on-the-job judgements, as well as evidence-based methods for improving the support structures of underrepresented minorities in STEM.

Fortune’s “Most Admired”
LyondellBasell, one of the world’s largest plastics, chemicals and refining companies and led by CEO and Chairman Bob Patel ('88 BS), was named to Fortune Magazine’s list of “World’s Most Admired Companies” for the 4th year in a row.

“This type of recognition is a direct reflection of the quality of our team,” said Patel.

Included in that group are other CBE alumni Dr. Hrishikesh (Rishi) Munj ('12 MS, '14 PhD), LB’s Global AD/TS Specialist; Nicholas Braun ('16 BS), Process Engineer; Brennan Muha ('20 BS), Assoc. Engineer; Rick Watson ('01 PhD), Research Engineer; and Bradley Wooledge ('95 BS).

In February, Halliburton named Patel to its board of directors.

Elif Miskioglu

Bhavesh V. (Bob) Patel

Jessica Tufts

Ah-Hyung Alissa Park

Alumna Named President
Advanced Sterilization Products (ASP), a global leader in infection prevention and a wholly-owned operating company of Fortive Corporation (NYSE: FTV) named Aisha Barry ('95 BS) president of the company. Earlier this year, Barry was appointed to the Kaman Corporation Board of Directors.

NEWS BRIEFS continued
Paul Matter ('01 BS, '06 PhD) has a lot of energy. Not only does he develop fuel cells which have the potential to create carbon emissions-free power, Matter is the founder of not one, but two Columbus-based companies that offer solutions for emerging applications related to more energy and catalysts. The technology will aid in the ongoing transition to sustainable energy sources by offering low cost production of "green" hydrogen, which is currently used in zero-emission fleet vehicles, as well as long-duration energy storage. "I've always been interested in clean energy," Matter said. "I see these efforts as a solution to climate change." He started his first company, pH Matter, LLC, (pHMatter.com) develops and commercializes carbon-based materials for emerging applications related to energy efficiency and nanotechnology.

Matter helped develop the technology as a doctoral student in the laboratory of Distinguished Professor of Engineering and Department Chair Umit S. Ozkan. With the help of a $2.3M Department of Energy contract, pH Matter's advanced catalysts are being developed to produce more durable, zero-emissions fuel cells for use in heavy-duty equipment such as forklifts and trucks.

The technology not only makes sense from an environmental standpoint, but an economic one. With the price of renewables now lower than fossil fuels, the economics are moving in that direction, and helping to drive the use of fuel cells in industry. Large corporations making the commitment to get to zero emissions. Zero-emission fuel is needed for heavy-duty applications where battery power is not realistic, and green hydrogen is expected to replace diesel fuel for applications including buses, heavy-duty trucks, ships, and trains. Fuel cells can store energy for long periods, so they offer advantages for vehicles like buses, long-haul trucks, and ships that need access to energy for extended periods. Fuel cells would be ideal for fleets, since hydrogen filling stations could be installed where the fleet is based. SARTA in the Akron/Canton area already has fuel cell buses that operate this way. Northern Europe, Germany, China and Japan have also embraced this technology. Fuel cells are not more widespread at present because of the lack of infrastructure required. Fuel cell costs will drop quickly with economies of scale, but widespread hydrogen availability is needed for widespread fuel cell adoption. However, the cost of renewable energy has reached the point where green hydrogen can be cost-competitive with hydrocarbon fuels once hydrogen generation systems and refueling stations are in place. Matter expects that by around 2030, about half of new trucks could be powered by fuel cells—market potential in the billions of dollars.

As renewable energy becomes more economical, more is being added to the grid every day, but without a few challenges. Wind and solar energy are weather dependent, potentially leading to interruptions in production and supply. Levels also vary between seasons, with a surplus during the summer and not enough during rainy or winter months. Realistically, long-term energy storage—up to six months—is needed to power the grid with mostly renewable energy.

That's where Matter's second company, Power to Hydrogen (www.power-h2.com), comes in. The company's efficient, long-duration fuel cell storage options are ideal for this purpose, and fuel cells excel in heavy-duty applications because the low cost of storing large amounts of energy in hydrogen containers is unmatched. This is how it would work. During peak periods of renewable energy production, surplus electricity can be turned into hydrogen and used for vehicles or stored for later use by the power grid, benefitting consumers with a continuous supply. Energy operators also benefit. Instead of losing money when their electricity supply exceeds demand, they can make hydrogen from the surplus and turn it into a valuable product.

"Hydrogen is a great fit for wind because you can take the excess energy wind often produces and store it indefinitely by making hydrogen with it, solving two problems," Matter said.

"Fuel cell technologies have advanced to the point that carbon-free emissions vehicles of all sizes are truly right around the corner." — Paul Matter

Surplus energy from renewables can also be fed directly back into the power grid for immediate use. Power to Hydrogen is developing a 'reversible' fuel cell that enables hydrogen to be generated from renewable energy, stored, and efficiently converted back into electricity at a low cost. The technology could soon land on the moon, thanks to a NASA Tipping Point contract to develop a custom prototype fuel cell power source for a future moon base microgrid. These fuel cells, which run oxygen and hydrogen through a catalyst to create electricity, produce only water as a byproduct.

The technology has to be adapted for the unique, extreme conditions found on the moon. Each lunar day is 420 degrees hotter than the Earth, split equally into night and day. So energy has to be stored for at least 350 hours. Having to anticipate a low-gravity environment and the extreme temperatures of the moon (-180 °C at night and up to 125 °C during the day) add to the challenge. The technology is also being developed for fleet vehicles, and eventually passenger vehicles, through a project funded by Shell.

Ohio is well-positioned to play an outsized role in the industry, thanks to earlier developments made at Ohio universities with Third Frontier funding. Ohio's infrastructure, early adopter markets (such as distribution centers and data centers), abundance of component manufacturers and the winds off Lake Erie add to the opportunity.
Encouraging Women in Engineering

In honor of Engineering Week (2/22-2/26) and Introduce a Girl to Engineering Day, Sara Imwalle shares her thoughts about encouraging women in STEM.

Since 2019, I have enjoyed a career with Black & Veatch in their Water business line, where I work as a process, civil and environmental engineer helping to ensure Southern California has clean drinking water. My job is both challenging and rewarding, and I’m so glad I persevered so that I can be where I am now. It was not an easy journey, however.

Why aren’t there more women engineers?

Obtaining a degree in engineering is not easy, and being a woman in a traditionally male-dominated field doesn’t make it any easier. From gender biases, a persistent wage gap, and the lack of female role models in STEM, there are many reasons why young women gravitate away from careers in engineering, but they are needed now more than ever.

In my first engineering class at Ohio State, out of 79 students, I counted fewer than five women! While the percentage of women in engineering continues to grow every year, they only make up about 20% of engineering graduates, despite making up roughly 56% of all college graduates.

This gender inequity and resulting symptoms presented itself throughout my college career. Many of the men I interacted with were kind and helpful, but many were not. I was often asked to serve as the secretary for group projects because I “had the best handwriting,” and my contributions to the group about project solutions were not always taken seriously. Pair this with the lack of female role models in engineering and I started to doubt my abilities. If it weren’t for my computer-scientist dad and my incredibly smart and supportive friends, I don’t think I would have graduated.

Engineering can be intimidating to any student, so we must remember to both encourage women to persevere through obstacles, while also encouraging society to treat them with the same level of respect that they treat males in the same curriculum.

A world without Madame Curie?! Play a part!

Representation is a significant factor when it comes to inspiration. It can spark young girls’ curiosity when women who love their engineering careers are normalized. Knowing that another woman made it through and is now enjoying a fulfilling career can make it all seem less daunting.

I encourage everyone, engineer or not, to take the time to introduce a girl to STEM. This simple gesture could be all she needs to unlock her interest and discover her passion.

You never know who will grow up to be the next Madame Curie or Rosalind Franklin. Take a moment to think about what our world would look like if those women had not been inspired to pursue a vocation in STEM.

Sara Imwalle, ’19

All Because of CBE

From John Rapach, ’61:

Back in the days when we moved from the Chemistry Building to the new ChemE Building (what is now Old Koffolt) the basement lab was called the “Black Hole” by our then-department chair, Joe Koffolt.

Joe was my father away from home. He loved to make things happen for people. He tried to find jobs for every graduating student, matching alumni as mentors and sponsors to support incoming students.

My sponsor was a Chem E alumnus named Grover Strickler. He got me a job every summer that paid for at least 50% of my college education.

Both Joe and Grover made it possible for me to grow and to be successful in Product Development and in marketing industrial chemicals. What I learned at Koffolt Labs that made my success in life is that it is paramount to understand Chemical Engineering in order to service customers who manufacture Industrial Chemicals. By learning the manufacturing process, one can provide the proper solutions to a customer’s needs.

In addition, learning to work with teams and helping each other tackle the problems to derive solutions is important. People Engineering, or knowing how to work with people, is more important than Classes or Labs. Ultimately, both skill sets need to be applied to problems to obtain the best outcomes.

As a result of the skills I gained at Ohio State, I’ve enjoyed a long career in the chemicals industry, working in water treatment, paint, storm water pollution prevention, R&D, and continuous improvement. I have owned Rapach Resources since 2001, marketing chemicals for use in coatings, plastics, paper, adhesives, automotive, rubber, polymers, mineral fillers, and surface active agents. Previously, I was a regional sales manager for different companies.

I am happy to say that my involvement at Ohio State lives on through my family. My two grown kids went to OSU, and we have two granddaughters that may choose Ohio State now.

I see a bright future for chemical engineering. It can play a critical role in guarding against the next virus or pandemic, and I am happy to support the department. Our whole class was active in donating to the new CBE. My classmate, Larry Woodworth (’61, deceased 2011), had the Polymer Lab in the new CBE named for him, and many others contributed as well.

John Rapach, ’61

Notes from a Road Trip

Dr. Tapajyoti “TJ” Ghosh, who recently won an AIChE “Best Paper” award that was written while he was a PhD student in Professor Shavik Bakshi’s group, took a moment to update us.

After obtaining my doctoral degree, I got a very nice job offer from National Renewable Energy Laboratory in Colorado as a full time Research Scientist. I knew the team from my internship at NREL in 2017 and they really wanted me to join their team. Two of my current colleagues, Rebecca Hanes and Shubhankar Upasani, also worked with me in Dr. Bakshi’s research group!

This national lab is entirely focused on renewable energy and sustainability. I am doing exactly the things I did for my research at Ohio State and the things I love and enjoy working on. Also, the mountains are added perks.

I started in May 2020. My mother was with me and did not want to fly during the pandemic. So we actually drove from Boston to Denver. I stopped at Columbus on the way. The department was closed but I stopped by, just to look at it once! I do hope I will be able to visit Columbus again after all this ends. Please stay safe and be careful.

Tapajyoti Ghosh, ’19
FROM ENGINEER TO MANAGER:
MAKING THE TRANSITION

In 2017, I embraced a new challenge while working as a production engineer at SABIC, a global petrochemical company based in Riyadh, Saudi Arabia. I was promoted to plant manager.

This required me to change my perspective from an engineer believing in “Conservation of Mass” to a manager with a view that “the whole is greater than the sum of its parts.”

Two main factors helped me:

Factor 1: Support from my team and management

One of the most important factors contributing to my personal and career growth has been the great team around me. When I became a manager, this team continued to inspire me and push me harder. At the same time, the managers in my company helped prepare me through formal trainings (courses and coaching sessions) and informal trainings (gradually assigning me to leadership challenges and assignments).

Factor 2: MBA

By the time I was promoted to PC manager, I was halfway through my MBA, which turned out to be a key factor in facilitating my transition.

The three-year journey cannot be summarized in a few lines, but here are some highlights:

- Human behaviors in the work environment impact how the overall organization performs.
- Financial statements are the instruments that allow investors, creditors, management to really assess organizations.
- Manufacturing processes can be optimized by understanding the supply chains and bottlenecks.
- Strategic thinking takes you from what you do today to where you want to be.
- “Scarcity of resources” is a basic concept from which all economic studies are established but it is fundamental to make good decisions.
- Understanding your customers is the first step in creating satisfied customers.
- Statistics and estimations are your tool when numbers cannot be measured.

In accepting the role of manager, I was assuming the responsibility to provide leadership and oversight for all operations of the plant. During this time, I focused on elevating my team to achieve more by clearly communicating my priorities to them.

I cannot judge my performance as a manager, but I was fully satisfied with our performance as an organization (thanks again to my great team). As a team, we successfully developed and executed multiple improvement programs that led to positive changes and improved performance.

Early in 2019, I was recognized by SABIC’s CEO for winning the 2018 Year-end Project Award across all SABIC divisions as part of the Polycarbonate Business Transformation and Plants’ Reliability Improvement Project.

This achievement was the jewel in the crown, and it coincided with an exciting opportunity which led to my current position as Internal Auditor at Saudi Aramco.

Transitioning to a Management Role: #MidCareerReflections

- Be ready and eager to take bigger roles and more challenges. It is a sign of growth.
- As you move on to new roles, you need to adjust your skills and attitude based on the new requirements. In most cases, there will be many overlapping skills, but it is possible that some skills will be less relevant.
- Invest in your education to be prepared for tomorrow’s job. You do not know when your next opportunity will come, and when it does, you want to be 100% ready.
- Leverage the power of teams. To achieve and deliver your highest potential, team spirit is the essential element to help you. Thus, you need to invest and to show commitment for building and capitalizing on relationships. High-performing teams support each other, and they do not accept mediocrity. As Steve Jobs puts it, “great things in business are never done by one person; they’re done by a team of people.”

By Musa Alharoon

Musa Alharoon graduated in 2011 from The Ohio State University with a BS in Chemical Engineering and obtained his MBA from King Fahd University of Petroleum & Minerals in 2019.

He began his career at SABIC in 2011 as a Failure Analyst, moved into the role of Production Engineer in 2013, and was promoted to Operations Manager in 2017. He joined Saudi Aramco in 2019, where he is currently a certified Internal Auditor and Fraud Examiner.

In 2019, Alharoon worked with The Ohio State Alumni Association to start the Ohio State-Saudi Alumni Chapter, connecting with 50 area Buckeyes. Their kickoff meeting was delayed by the pandemic. Visit LinkedIn’s “Alumni of The Ohio State University in Saudi Arabia” for details.

Alharoon shares insights from his career journey on LinkedIn under the hashtag MidCareerReflections.
Remembering a Pioneer

Dorothy Elene Pettenski (nee Evans) was never one to play with the “girly” girls. Instead, she preferred being her father’s right-hand woman, always ready to help with projects around the house. She became a “Jill of all trades” and was especially handy when it came to plumbing, willing to tackle anything from fixing shingles on a roof to replacing a toilet.

After graduating from high school, she enrolled in Ohio State’s chemical engineering program, where she received a perfect grade point average, earned the Tau Beta Pi honor badge, and was a proud member of the Society of Women Student Architects and Engineers. She obtained her bachelor’s degree in chemical engineering in 1948, making her one of CBE’s earlier women alumni in chemical engineering. She often talked about how proud her dad was upon her graduation, since he was unable to attend college himself.

Her success at Ohio State was followed by an equally successful career and life.

She met the love of her life, Louis Pettenski, while she attended their sons graduated from The Ohio State University. Dorothy returned to the work force once all four boys were in school, and she worked for GFS Chemicals until her retirement. Once she retired, Lou and Dorothy enjoyed travel, socializing and taking classes at the Martin Janis Senior Center. She took up drawing and discovered a hidden talent for creating life-like portraits of wild animals done in colored pencil. Many a friend commissioned a portrait of their beloved dog or cat. Dorothy was also an accomplished seamstress and knitter, always ready with a new pair of booties when she heard someone was having a baby.

Dorothy and Lou relocated to Columbus, where they raised four boys near the Ohio State campus. As a mother, Dorothy had a collection of classic phrases that she invoked when her sons were misbehaving. “If I have to quit my job because of you kids…” “That irks my soul”; and “You make a better door than window” were a few of her favorites. Whenever someone implied that something would be difficult or messy, Dorothy would remark, “I raised four boys…” as if everything else would be a piece of cake.

Dorothy and Lou were Buckeye fans and were proud that all four of their sons graduated from The Ohio State University. Dorothy returned to the work force once all four boys were in school, and she worked for GFS Chemicals until her retirement. Once she retired, Lou and Dorothy enjoyed travel, socializing and taking classes at the Martin Janis Senior Center. She took up drawing and discovered a hidden talent for creating life-like portraits of wild animals done in colored pencil. Many a friend commissioned a portrait of their beloved dog or cat. Dorothy was also an accomplished seamstress and knitter, always ready with a new pair of booties when she heard someone was having a baby.

She and Lou became certified Master Gardeners and were founding members of the volunteer program at Ohio State’s Chadwick Arboretum. In 2008, Dorothy and Lou took their gardening to the next level, relocating to their 43-acre farm near Marysville.

Dorothy and Lou were quite active in retirement. They attended their grandchildren’s sporting events and became fixtures at the Marysville library, restaurants, and senior center. They made friends wherever they went and were known for their stories and spirited discussions. In fact, a waitress once told Dorothy that if they knew each other when they were younger, they probably would’ve served time together.

After Lou’s death in 2018, Dorothy remained on the farm with her precious canine companion, Buddy, until failing health necessitated a move to the Bluebird Retirement Community in Marysville. She passed away on January 9, 2021.

Harry Roger Drackett (1885-1948) graduated from The Ohio State University in 1907 with a bachelor of science in chemical engineering as a member of the departments second graduating class.

He eventually went to work for the Cincinnati-based company his parents founded, P.W. Drackett & Sons, which developed industrial and home care cleaning products.

In 1933, Drackett developed Windex, which because of its convenience and advertising soon became the first successful glass cleaner on the market. CBE has one of the original products. A bottle of Windex, labelled “Drackett Professionals,” is displayed in the upper-left corner of the display case on the third floor of Koffolt Laboratories. A copy of his senior thesis stands behind the Windex bottle.

Drackett remained active with Ohio State after his graduation and served on many boards and committees, including as chair of the Alumni Advisory Board for ten years.

Drackett Tower, a residence hall which opened in 1965, was named for him in recognition of his service to the university. It is viewable from the CBEC 6th floor lounge.

Harry Drackett is included in the Ohio State University Office of Research’s “150 Innovations in 150 Years” project, which highlights alumni whose research or inventions have made a significant impact on society.

Melvin DeGroote, America’s most prolific inventor, was also included in the “150” project. DeGroote was featured in our last issue of Koffolt News.

Did You Know?

Inventor was CBE alumnus

Harry Drackett’s success in developing and marketing Windex glass cleaner made it one of the most recognized household products of all time.
Career Corner
A sampling of jobs and recent promotions from LinkedIn

1980s
Ron Howdyshell, '83 BS
Plant Manager
MiIisco Manufacturing
Chelsea, MI
David Flautt, '85 BS
Financial Advisor
Edward Jones
Ashatabula, OH
Todd Hess, '88 BS
Shareholder
Haynsworth Sinkler Boyd, P.A.
Matthews, NC
Mark Mansour, '86 BS
Enterprise Business Analysis Manager
Western & Southern Financial Group
Loveland, OH
Bryan Zehner, '85 MS
Process Engineering Specialist
Biopharma at Genentech
Springboro, OH

1990s
Elaina Carpio, '99 MS COO
LUMA Institute
Columbus, OH
Donna Keener, '91 BS
Executive Recruiter
LeaderStat
Columbus, OH
Darrin Lacheta, '90 BS
Corporate Safety Manager
HBD Industries, Inc.
Columbus, OH
Chad Laubenthal, '99 BS
Maintenance & Reliability Mgr
Chemtrade
Cairo, OH
Nicole Voss, '98 BS
Director, Sustainability
Advanced Drainage Systems
Columbus, OH

2000s
Amanda Akseli, '08 BS
Planning Director
3PM Foods and Refreshments
Unilever Food Solutions
Jersey City, NY
Lena Alqaraen, '20 BS
Engineering Associate
Owens Corning
Columbus, OH
Chris Atkins, '13 BS
Senior Vice President
Alix Partners
Chicago, IL
Sefanit Berihun, '12 BS
Digital Business Owner
Columbus, OH
Mike Blass, '02 BS
Manager, Engineering & Construction
Bayer Crop Science
New Orleans, LA
Peter Brandt, '16 BS
Program/Launch Manager
Hematite
Cincinnati, OH
Shawn Brueggemeier, '00 BS
Director
Bristol Myers Squibb
New Brunswick, NJ
Reid Burkhart, '14 BS
Cyber Security Researcher
Battelle
Columbus, OH
Dr. Adam Burley, '06 BS,
'11 MS, '12 Ph.D.
Sr. Materials Scientist
Continental Structural Plastics
Rochester, MI
Kevin Burnett, '20 BS
Technical Solutions Engineer
Epic
Madison, WI
Justin Carpp, '12 BS
Technical Manager
Arkema
Pasadena, TX
Joshua Colley, '16 BS
Production Engineer
Ashland
Columbus, OH
Eric Collins, '18 BS
Sr. Financial Analyst
Vanguard
Scottsdale, AZ
Tiffany Colon, '15 BS
Engineering Project Mgr
Reyes Coca-Cola Bottling
Los Angeles, CA
Merideth Cooper-Steiger, '16 MS,
'18 PhD
Product Engineer
Owens Corning
Westerville, OH
Phillip Deis, '06 BS
Facilities Eng’g Projects Lead
Chevron
Windsor, CO
David D’lima, '18 BS
Machine Learning Engineering Pilot Company
Atlanta, GA
Jonathan Duran, '15 BS
Project Engineer II
DTE Energy
Ann Arbor, MI
Dr. Ryan Griffith, '08 BS
Attending Physician
The Toledo Clinic
Sylvania, OH
Trevor Grupp, '15 BS
Process Engineer
HFI
Huntsville, AL
Brian Kiel, '12 BS
Product Engineer
Performance Health
Cleveland, OH
Scott Kruzinski, '12 BS
Product Manager
Avery Dennison
Greater Cleveland, OH
David Linville, '04 BS
VP-Global Operations
May zo, Inc.
Smyrna, GA
John Logue, '14 BS
Manufacturing Technology Principal Engineer
The Chemours Co
Parkersburg, WV
Andrew Loth, '02 BS
Global Quality Consultant
Arcturus Strategic Consulting
Savannah, GA
John McNelis, '18 BS
Plant Technical Service Representative
Sherwin-Williams
Columbus, OH
Jeremy Miller, '03 BS
Account Executive
Johnson Controls
Westerville, OH
David Nelson, '16 BS
Plant Quality Manager
Sherwin-Williams
Fernley, NV
Alfred Nehme, '00 BS
Associate Professor
Computer Science
Bellevue College
Bellevue, WA
Brittany Niles, '12 BS
Associate
Hull Street Energy LLC
Washington, DC
Imogen Pryce, '06 BS
SVP, R&D Operations and Strategy
Relay Therapeutics
Boston, MA
Brandon Renner, '18 BS
Sr. Electrical Controls Tech
Mars
Columbus, OH
Dr. Janani Sampath, '18 PhD
Assistant Professor
University of Florida
Gainesville, FL
Alex Sarmiento, '11 BS
Integrated Solutions Sales Mgr
Sartorius
Raleigh-Durham-Chapel Hill, NC
Corey Sceranka, '19 BS
Associate Chemist
Sherwin-Williams
Greater Cleveland, OH
John Swiger, '95 BS
VP Finance
Golden Pass LNG
Houston, TX
Jeremy Williams, '99 BS
Strategic Account Advisory
Strategic
Columbus, OH
Oray Talu, '10 BS
Integrated Solutions Sales Mgr
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Sherwin-Williams
Greater Cleveland, OH
John Swiger, '95 BS
VP Finance
Golden Pass LNG
Houston, TX
Avery Dennison
Fernley, NV
Dennis Tran, '16 BS
Software Engineer
JP Morgan Chase
Columbus, OH
Alexis Uber, '16 BS
Sourcing Manager
Luxury Brand Partners, LLC
Fort Lauderdale, FL
Charles Vincent-Barr, '19 BS
Field Engineer
Liberty Oilfield Services
Shreveport, LA
Shernaz Wadia, '02 BS
Pediatric Emergency Physician
Dayton Children’s Hospital
Mason, OH
Jane Whitten, '17 BS
Purchasing & Storeroom Supervisor
General Mills
Cincinnati, OH
Joshua Wiseman, '19 BS
Supplier Quality Engineering Smiths Medical
Columbus, OH
Philip Wollenberg, '02 BS
Senior Process Engineer
Shell Exploration & Production
Kenner, LA
Jason Zheng, '18 BS
Engineer-Security & Electronic Systems
M.C. Dean, Inc
Arlington, VA

ATTENTION ALUMNI!
Tell us about your news and jobs! Your classmates are interested!

please email wenda williamson.416@osu.edu with your CHE degree(s), title, employer, and City/State!
FACULTY

News Briefs

AWARDS & HONORS

Bhavik Bakshi: Award
Richard M. Morrow Professor of Chemical and Biomolecular Engineering Bhavik Bakshi was selected to receive the American Council for Life Cycle Assessment’s LCA Education Leadership Award. He also won the Clara M. and Peter L. Scott Faculty Award for Excellence in Engineering Education, the highest recognition given to a senior faculty member by the College of Engineering.

L.-S. Fan: ACS Sole Recipient
Professor Liang-Shih Fan was the sole recipient of the American Chemistry Society’s Energy and Fuel Division’s 2021 Distinguished Researcher Award. He was selected on the basis of his outstanding contributions to energy and fuels research, particularly his pioneering development of chemical looping combustion and chemical looping gasification.

Hall Group: Editor’s Choice
AC S Publications, scholarly publisher of over 75 journals, chose an invited perspective by Professor Lisa Hall and Kuan-Hsuan (Kevin) Shen and Mengdi Fan for its February 13, 2021 ACS Editor’s Choice feature.

The article, published in Macromolecules, highlights a variety of recent molecular dynamics work that applies generic coarse-grained models to study ion-containing polymeric materials.

Reátegui: Research Award
Assistant Professor Eduardo Reátegui won the College of Engineering (COE) Lumley Research Award. Reátegui’s translational microtechnology research combines microfluidics, biomaterials, and molecular imaging techniques to help better diagnose, study and treat cancer and infectious disease.

Magnetic Cell Team Award
Professors Jeff Chalmers and Andre Palmer won the COE Lumley Interdisciplinary Research Award.

Jeff Chalmers, who studies bioengineering and the intrinsic magnetization of cells with implications to separation cancer detection, leads the Magnetic Cell Team, which started over 25 years ago with a Cleveland Clinic Foundation collaboration. Applications emerged from this and soon Ohio State medical doctors and researchers joined the team.

Ohio Eminent Scholar Professor Palmer, an expert on human red blood cell physiology and hemoglobin biochemistry, also joined the project.

Within the last five years, both the applications of “magnetic cells” and team members have increased, to now include the universities of Pittsburgh, Colorado, and Maryland.

Ozkan’s Mentoring Recognized
College of Engineering Distinguished Professor and Department Chair Umit Ozkan, who was just named a University Distinguished Scholar, received the COE Faculty Mentoring Award. The award recognizes demonstrated excellence in the mentoring of one or more early-career faculty members within the College.

Professor Ozkan is a trail blazer and leader in heterogeneous catalysis and its applications to energy and environmental protection. Faculty cited her success as a researcher, dedication as a teacher and administrator, and warm personal style as factors that make her an outstanding mentor for young faculty.

Ozkan also serves as an important role model for women in chemical engineering, having begun her career when there were only a handful of women faculty in chemical engineering nationwide.

N95 mask shortage alleviated
During the early phase of the Covid-19 pandemic, healthcare workers faced a critical shortage of personal protective equipment (PPE), which put them and their patients at increased risk.

Columbus-based R&D firm Battelle Memorial Institute had an answer: sanitize N95 face masks for re-use.

The program, called the Battelle Critical Care Decontamination System (CCDS), was headed up by Professor of Practice John Clay, who continues to hold a part-time position with Battelle.

This effort involved the use of vapor phase hydrogen peroxide (VHP) to decontaminate N95 filtering facepiece respirators, permitting re-use. Through December 2020, CCDS had decontaminated and returned over 4 million N95 face masks to healthcare workers, substantially increasing safety for Columbus healthcare workers and patients.

COVID-19 RESEARCH

New testing technology
Assistant Professor Eduardo Reátegui and Professor Emeritus L. James Lee are leading an interdisciplinary effort funded by a 2-year $1.8M NIH grant to optimize Covid-19 testing and address future viral outbreaks. The method uses existing microarray technology they initially developed for the characterization of single extracellular vesicles from biofluids. Once optimized, the method could provide up to 100x accuracy.

Coronavirus Testing by App
Assistant Professors William Xiaoguang Wang, Joel Paulson, and other faculty are finding out if detecting coronavirus infection is possible using surfactant-laden liquid crystal (LC) films and a novel smartphone app.

Initial research was published by CellPressNews.
ENTREPRENEURIAL PROGRESS

Low-cost CO₂ Capture to be Demonstrated at Engineering Scale

The dream of economically reducing carbon emissions is one step closer to reality. The membrane technology developed by Distinguished Professor of Engineering and Chemical Engineering W.S. Winston Ho and team could be a significant boon to power plants while providing much-needed CO₂ products to the oil, chemical and food industries.

Due to its economic viability, Ho’s project is the only one that the Department of Energy has asked for an engineering-scale project.

Core Quantum Technologies Ramps Up

Professor Jessica Winter’s start-up, Core Quantum Technologies, Inc. (CQT) has made progress towards commercializing its magnetic nanoparticles, a product that would help biobanks researchers to identify and isolate cell types.

Assisted by a National Science Foundation SBIR grant and funding from The Ohio State University Office of Technology Commercialization’s Concept Fund (managed by Rev1 Ventures), CQT is preparing to ramp up production of its fluorescent and magnetic reagents for cell separation and flow cytometry by hiring additional staff and quality control equipment.

Significant scientific progress led by Dr. Mythreyi Unni has allowed Core Quantum to finalize manufacturing and focus on sales. Unni made the most of the closures due to the pandemic and focused on step-by-step quality control of the manufacturing process to create robust products with reproducibility, said CEO Kristie Krug.

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FUNDING SUCCESS

Junior Faculty Win Funding

In December 2020, Li-Chiang Lin, Katelyn Swindle-Reilly, and Xiaoxue Wang were among 12 Autumn 2020 recipients of Ohio State’s Institute for Materials Research (IMR) Kickstart Facility Grants.

Projects include:

- “In Silico Screening of Metal-Organic Frameworks for Water Harvesting.” Li-Chiang Lin
- “Material Characterization of Redox-Responsive Nanoparticles.” Katelyn Swindle-Reilly

MEDICINE

Support for Blood Substitutes

With blood shortages and supplies at risk due to infectious diseases such as COVID-19, safe and effective blood substitutes for use in transfusion medicine are more important than ever.

Ohio Eminent Scholar and Professor Andre Palmer has dedicated 20 years to this research, supported by multiple federal grants.

Under Palmer’s new four-year, $2.7 million grant from the National Institutes of Health (NIH), Professor David Wood joins the effort to develop chemically well-defined red blood cell (RBC) substitutes that could help save lives.

Magnets and the Iron in Blood

CBE Professor Jeff Chalmers and Radiation Oncology’s Monica Venere are using magnets to separate cancer stem cells from non-cancer stem cells using the naturally-occurring iron in the malignant cells.

The collaboration could improve future treatments for one of the most deadly forms of brain cancer.
Junior wins three Student Leadership Awards

What’s better than winning an award? How about winning three! Undergraduate Anjali Tewari won all three of The Ohio State University Office of Student Life’s Leadership Awards: the Spirit of Ohio State-Individual Award; the Boehm Holistic Wellness Award; and the Diversity Engagement Award.

Anjali has made a significant impact in the chemical engineering department through her efforts to spread awareness on student mental health challenges, promote student professional development, encourage diversity and women in ChemE; and more. All while managing a rigorous academic schedule.

Membrane Science Students to Present Papers at NAMS

Andrew Deng, a Ph.D. student co-advvised by Li-Chiang Lin and Winston Ho, and Yutong Yang, a Ph.D. student in Winston Ho’s group, received the 2021 Elias Klein Founders’ Travel Supplement Award from the North American Membrane Society (NAMS).

Based in part on the merit of academic achievements, the award will provide $500 to support travel to the NAMS Annual Meeting in Estes Park, CO on August 29-September 2, 2021, where the students will present their papers on transport and amine-containing membranes, respectively.

Sustainability Engineering Best Paper Award


Kyuha Lee, a doctoral student in Professor Bakshi’s lab, researches sustainable process and supply chain design considering the food-energy-water nexus, economic constraints, and climate change. Tapajyoti Ghosh now works for National Renewable Energy Laboratories in Colorado.

Whey More Productive


Sunny’s research demonstrates how his process results in increased usable product components, better processing time and more overall productivity—potentially of significant benefit to the food, dairy, pharmaceutical and energy industries.