ChE Professor Alexander Couzis named Dean of The Grove School of Engineering

Following a national search, Prof. Alexander Couzis, who had been serving as interim dean, was appointed permanent Dean of The Grove School of Engineering at The City College of New York on May 2, 2022.

A chemical engineer, Couzis’ areas of expertise include interfacial engineering, nanomaterials, colloids systems, energy storage, and scale-up processes. He joined the college in 1994 as assistant professor of chemical engineering following a stint with the International Paper's Applied Polymer Science Division. He quickly rose through the ranks to full professor and was named Herbert G. Kayser Professor of Chemical Engineering in 2004. Couzis served as the department chair from 2008 until 2013, when he took a five-year leave to serve as CTO and later CEO of Urban Electric Power, a NY-based clean energy company start-up that was founded at the Grove School. In January of 2018, Couzis returned to his duties, as professor and researcher at City College while maintaining an advisory role in UEP. Shortly following his return to academia, Couzis was appointed interim dean of the Grove School effective July 1, 2020 and in the spring of 2022, was named the Daniel and Frances Berg Professor of Chemical Engineering.

Couzis’ impact spans generations of chemical engineering students, throughout which time he has displayed an unwavering devotion to the school, its mission, and its students. When asked for his vision, Couzis stated, “For over a century, we at the Grove School have been altering the lives of our students by giving them the foundation to become successful engineers. As the years have progressed, so have the challenges, and it is my desire to work collaboratively with our faculty, staff, students, and just as importantly, with our alumni and external partners to remain at the forefront of technological relevance in the quality of our teaching and in our cutting-edge research.” The Department of Chemical Engineering is thrilled to help him carry out his vision for the school and the future generations of aspiring engineers it aims to serve.
Dear Alumni and Friends of the Department,

I hope you are spending a very Happy Thanksgiving with your loved ones! I cannot believe it is already November, this Fall semester is going by way too fast. We completed a successful ABET visit thanks in great part to our ABET expert Prof. Ray S. Tu. We also attended a fully in-person AIChE meeting and enjoyed seeing many of you there after so many years.

It is with great delight that we announce that our very own Prof. Alexander Couzis was appointed Dean of The Grove School of Engineering (GSOE) in May 2022. We are thrilled by his vision for GSOE and will work with him to make it a reality. In other exciting news: we are hiring new faculty.

In June 2022, we graduated another large class of successful students from our program in the first in-person graduation ceremony held in three years. Our faculty and students have been busy collaborating on conferences, getting awards, participating in industry and research internships, having fun at picnics and other outings, while also obtaining funding from federal agencies such as NASA and NIH.

Our alumni have been keeping busy as well, mentoring students, engaging with each other in outings and workshops, and teaching at CCNY. Dr. Juan Jimenez (ChE BE ’15) is teaching the ChE 43200 reaction engineering course as an Adjunct Assistant Professor since Prof. Elizabeth J. Biddinger is on sabbatical traveling, developing new course materials and guest researching at Bristol Myers Squibb. More about Juan’s experience will be in the Spring 2023 Newsletter. Prof. Jeff Morris is also on sabbatical, enjoying collaborations with the Flatiron Institute and IBM. Last but not least, we have resumed our ChE seminar series in-person and had Prof. Kristi Anseth from the University of Colorado at Boulder present the 2022 Katz Lecture in April.

Enjoy the Newsletter and I look forward to hearing from you!

- Ilona Kretzschmar

In memoriam: It is with a heavy heart that I write this alumni memorial for Derrick J. Lawson (ChE BE ’21). Derrick passed away on November 2, 2022, at a way too early age. I had the pleasure to instruct Derrick in Thermodynamics 2 and Introduction to Material Science. He was an inquisitive, vibrant, and brilliant student. Derrick would visit my office during his time at CCNY and we would discuss life in general and financial support for students specifically. Derrick would come up with creative ideas, such as holding a gaming convention at CCNY to create an endowment for the department that would enable us to support students and faculty alike. Derrick joined the research group of Prof. Elizabeth Biddinger in his junior year. He worked with doctoral candidate Samaneh Sharifi Golru on electrolyte effects on CO\textsubscript{2} electroreduction. Prof. Biddinger described Derrick as a student with “an incredible intuition for chemical reaction mechanisms.” After Derrick graduated from CCNY in 2021 with a BE in Chemical Engineering, he started working at Aveva where he designed software for various industries.

Graduating with his Chemical Engineering degree was one of Derrick’s proudest accomplishments. He cherished the friendships, knowledge, mentorship, and memories he gained along the way. Derrick was well-known for his big personality and even bigger hugs. To his classmates, he will be remembered for his quick wit and on-the-nose humor, ability to make people laugh, even through exams. To those lucky enough to have known him, Derrick was an amazing and creative cook, a mountain man, a ruthless board and video gamer, a trivia extraordinaire, and the most wonderful friend you could ever find.

We would like to create the Derrick Lawson Endowed Scholarship in Derrick’s honor and memory. The scholarship will be used annually to support a student in financial distress, something that Derrick would have loved to see come true. If you are interested in contributing to the Derrick Lawson Scholarship fund, please contact Prof. Ilona Kretzschmar at ikretzschmar@ccny.cuny.edu.
Nearly five years ago a collaboration between Prof. Marco J. Castaldi and Prof. Israel E. Wachs (ChE BE ’73) from the Chemical and Biomolecular Engineering Department at Lehigh University that most recently culminated in the organization of the 27th North American Catalysis Meeting (NAM27) in New York City, co-chaired with Dr. Lucas Dorazio (BASF). The meeting was held from May 22 to 28, 2022 at the New York Midtown Hilton Hotel. Founded in 1956, the North American Catalysis Society promotes the science of catalysis and ancillary scientific disciplines. The Society is responsible for organizing the biennial North American Catalysis meeting (NAM), which brings together researchers from all over the world who work in industry, academia, and national laboratories to highlight new developments, discuss interesting viewpoints, and exchange information. The first NAM meeting (1969) was held in Atlantic City. NAM27 represented the first time the meeting was held in New York City and while originally scheduled for Spring 2021, the pandemic caused a one-year delay, and only thanks to the conference chairs’ commitment was it able to run in Spring 2022.

This international conference attracted 1,621 abstracts from 39 countries with the following submission distribution: 81% from academia, 11% from national labs, and 8% from industry. Overall, attendees from 41 countries participated with 63% of attendees visiting from North America, 21% from the European Union, 10% from Asia, 3% from South America, and 2% each from the United Kingdom, Africa, and the Middle East. Ultimately, there were 1,453 researchers in attendance, and among them were several of our ChE graduate students. One of the students was Kaitlyn Lawrence, a third-year PhD student in Prof. Castaldi’s group. Reflecting on the conference, she stated: “I am grateful for all the bright minds I crossed paths with at NAM27. I was honored to give a talk about my recent and still nascent work at CCNY’s Grove School of Engineering, and I feel so inspired to return to the lab after hearing about the experiments and progress being made in other groups that presented there.” It is student experiences like Kaitlyn’s that motivate faculty involvement in the organization of conferences. Another unique aspect of Profs. Castaldi and Wachs’ collaboration was that Prof. Wachs is himself an alumnus of our Department, Class of 1973.

The Grove School of Engineering and the CCNY President’s Office supported Profs. Castaldi and Wachs’ efforts by contributing to the meeting as Silver Sponsors. The conference also received support from the CCNY ChE Department, the Levich Institute, and the CUNY Energy Institute. It should also be noted that Dr. Stu Soled (BS Chem ’69) of ExxonMobil and current member of our External Advisory Board (EAB), was chosen by the organizing committee to be recognized as the Honorary Chair, while Dr. Jan Lerou (also a current ChE EAB Member) served as fundraising co-chair of the meeting. In summation, CCNY was prominently visible in the organization of one of the most successful NAM conferences to date.

NAM supports student participation at meetings through the Richard J. Kokes Travel Award program that covers housing and conference registration. Students who are enrolled in North American Universities and have been selected to present a paper at the meeting are eligible and once selected are expected to attend the whole meeting. The NAM27 organization committee and specifically the 2022 Kokes Award Co-Chairs, CCNY ChE Prof. Elizabeth Biddinger and Prof. George Tsilomelekis from Rutgers University, organized funding for the Kokes Award. Applications were evaluated by 23 external reviewers. NAM27 selected 111 Kokes Awardees, and two of whom were CCNY PhD students: Andrew May and Kaitlyn Lawrence from the Biddinger and Castaldi groups, respectively.
A ChAMP Update

Long Ng (ChE BE ’18), a processing engineer at PepsiCo, and the officers of the CCNY AIChE Chapter have been working together to form closer relationships between undergraduates, alumni, and the Department of Chemical Engineering at CCNY in an effort that crystallized into the Chemical Engineering Alumni Mentoring Program (ChAMP) in summer 2020. ChAMP’s main objective is to further increase the number of quality job offers and opportunities for new ChE-BE graduates through pairing ChE alumni (“mentors”) with interested ChE undergraduate students (“mentees”). In this past Spring 2022 Newsletter, we reported on the “mentee” experience and now in this newsletter, we’re reporting on the “mentor” experience.

Dane Christie (ChE BE ’13) a current mentor for ChAMP recalled his experience: “The ChAMP program is a wonderful networking opportunity for students and alumni alike. Hearing of students’ concerns and aspirations brings nostalgia of my time as a student in GSOE; it is a shared experience. This is an obvious thing to say but worth mentioning nonetheless. There are two items I tend to focus on when interacting with mentees. First is the reality of an engineering degree and the profession. The problems never get easier with time, one’s ability to cope does. Second, when solving real problems, the individual is insignificant, teams win, individuals do not. One needs to leverage communication skills that are not taught in the engineering curriculum, to work effectively within an organization. My own professional development has benefited from participating in ChAMP. As I have encouraged mentees to enhance their communication skills and develop mental resilience against the stresses associated with attainment of the degree and being a working professional, I have identified gaps in my own competence and have sought ways to develop myself.”

In the last season (2021/22), ChAMP showed signs of strong early interest. However, as the academic year progressed and we transitioned back to in-person learning, the level of engagement between mentors and mentees declined. Now that we are in person, Long and the AIChE E-Board are doubling their efforts and are taking a more proactive approach in the coming year, including activities such as providing additional suggestions for meeting topics, monthly check-up sessions, and alumni nights. We are excited about the increased level of engagement and new mentors and mentees who joined ChAMP.

ChAMP Mentors Are Needed! ChAMP is looking for ChE alumni who are interested in interacting with our ChE community to help build better relationships between students and alumni. Alumni who are interested in mentoring, please email Long Ng at longngche@outlook.com.

Alumni Events

In a continuous effort to build a stronger ChE community, Silvija Skemaite (ChE BE ’20), Luis Ortiz (ChE BE ’20) and Long Ng (ChE BE ’18) planned a series of virtual and in-person alumni events for 2022. Earlier this year, they hosted a virtual small group discussion on exploring new career opportunities. Charlie Corredor (ChE BE ’09) and Julius Edson (CHE BE ’12) volunteered to lead the discussions and shared their experiences.

In July, taking advantage of the fantastic summer weather, they organized a picnic in New York City’s Central Park. Alumni within the tri-state area joined. Everyone had the chance to meet each other and enjoy a relaxing day out. On October 9, alumni spent the afternoon at a Manhattan cafe conversing and playing boardgames. On October 27, thanks to the effort of Klement Miraj (ChE BE ’20), alumni hosted their first ChE happy hour in the Greater Philadelphia area. They were encouraged by the response and will continue planning local alumni events in the area. We encourage you to take part! They plan to expand the in-person alumni programs beyond the Greater NYC area.

Please keep an eye out for a virtual gathering on 11/30 and a late December holiday reunion in New York. With many traveling home for the holidays, it will be a good opportunity to meet old friends as well as make new contacts. If you have any interest in upcoming alumni activities or alumni programs in general, please contact Long Ng at longngche@outlook.com.
In their own words...

Sadia Zannat Nipa, ChE BE Fall ‘22: I interned at Merck & Co. Inc this past summer as a Global Engineering Solution Intern at their Rahway, New Jersey campus. During my internship, I assisted in the implementation of Autoclaves safety signage in the mechanical area to reduce incidents. I had to utilize Autodesk Assemble and Power BI to track under-slab waste pipe installation work in place and compare that with the baseline schedule for Merck’s Biologics Development Center (BDC) capital project ($429 MM). I also assisted in coordinating with vendors for preventative maintenance quotes for Merck’s BDC projects and participated in weekly project management, design, process hazards analysis and process safety meetings. Throughout my internship, I had the opportunity to make new connections in different business areas of Merck. I also learned about the different phases of a capital project, the difference between GMP and non-GMP areas, pilot plants and much more. After graduating this fall, in January 2023, I will start a full-time position at Merck as an Associate Scientist, Quality Assurance in West Point, PA.

Isabella Huang, ChE-BE Junior: This summer, I conducted research at Columbia University as a Columbia-Amazon SURE fellow. I studied polymer-grafted nanoparticle (GNP) membranes with the Kumar Group of the Chemical Engineering department. Membrane-based separation is a low-cost and energy-efficient method for capturing greenhouse gases, compared to other methods such as distillation. The Kumar Group works to improve the permeability and selectivity of GNP membranes. My project focused on aging effects on GNP membranes, specifically temperature and the addition of free homopolymers of different lengths. For this experiment, we added different weight percentages of 6kDa, and 96kDa polymers to a 0.52 ch/nm² 125 kDa pure GNP. Once formed, the membranes were placed in the Small Angle X-Ray Scattering machine (SAXS) for in-situ annealing at set temperatures. SAXS was used to collect interparticle spacings data for each membrane. The data showed that as time increases, the structure equilibrates at the set temperature, and that as the temperature increases, the membrane structure is more well-defined on the intensity curves. During my experience, I was fortunate to operate the SAXS, use Python to analyze and understand SAXS data, and present my research in a professional manner. After presenting my work at the SURE Symposium, I learned that I really enjoy talking about my research, and I hope to participate in more research presentations in the future!

Mubdi Shah, ChE-BE Senior: I completed an internship this past summer as part of the CIPASS STEM internship program, where I was chosen to conduct research under Prof. Lane Gilchrist with fellow ChE-BE Junior, Fariha Islam. We researched plant seeds to understand their properties and characteristics by looking at them in pure form and in solutions prepared from them with a confocal and Raman microscope. From the data we gathered from the microscopes (the plants’ 3D structures), and the microscope’s software we learned to improve the microbiome of the plant so it can grow healthier and more efficiently with more nutrients to further the field of vertical farming, which was one of our main goals. I learned a lot about what vertical farming is, i.e., plants are grown hydroponically (no soil use), as well as different types of plant seeds and their unique characteristics such as their surface structure and difference in size. I did research in a bioengineering lab, received safety training, and used the instruments in the lab with correct safety measures in place. I was trained to use a confocal and Raman confocal microscope to image specimens such as plant seeds. I conducted research in a team that was able to achieve the goal of presenting the research findings in a poster symposium held in the Great Hall in Shepard in August. I also had the opportunity through CIPASS to attend their weekly professional development sessions, which helped me to improve my resume and cover letter, and worked with an assigned counselor from CIPASS to improve my interviewing skills in preparation for applying to jobs as a senior.

Maggin Calderon and Erica Razook, ChE-BE Seniors: We served as Adrienne Arsht Interns in the Department of Scientific Research at the Metropolitan Museum of Art (MET) this summer, working with scientists and conservators at the MET on an analysis of transport phenomena of metal carboxylates in oil-based paints, in abstract expressionist paintings from the 1940s and 50s. The main objective of our research was to assist in the evaluation of a localized heating treatment on the surfaces of paintings experiencing metal soap “efflorescence,” the appearance of a white “haze” due to metal carboxylate mass transport occurring over decades after a paint was mixed and applied to a canvas by the artist. We built two-component systems, modeling the (i) metal and (ii) fatty acid components of relevant paints, and worked with the MET team to get these models to resemble actual paint samples as closely as possible. We were trained to use x-ray photoelectric spectroscopy, fluorescence microscopy, and time-of-flight secondary ion mass spectrometry and are looking forward to building our skills with these analytic techniques to begin mapping the full depth of the paint surface compositions and microstructures as we continue our research in Prof. Raymond Tu’s group.
In August 2022, the Chemical Engineering Student Council hosted a summer picnic at the Great Hill in Central Park for PhD and MS students funded by the department. The event was a success as it turned out to be a beautiful sunny day that brought together the graduate students from across the whole department and gave them a chance to take a break from their research and laboratory experiments to enjoy the end of the summer with some team-building exercises and recreation. They brought picnic blankets, food and snacks, and played board games and sports like Settlers of Catan, corn hole, and frisbee. It was also a great opportunity for the new MS and PhD students, who were looking forward to joining the department in Fall 2022, to meet senior students and learn about the research in the Department of Chemical Engineering at CCNY in an informal setting.
Four ChE faculty at CCNY were awarded a $2M, 2-year extension for the NASA-CCNY Center for Advanced Batteries for Space (CABS), housed within the Department of Chemical Engineering at CCNY, resulting in a total NASA investment of $5M to CCNY. Prof. Rob J. Messinger, Director of CABS, along with co-investigators and ChE faculty Prof. Elizabeth J. Biddinger, Alex Couzis, and Sanjoy Banerjee lead the Center’s efforts.

NASA-CCNY CABS is a joint research and education center between CCNY and NASA’s Jet Propulsion Laboratory (JPL), with additional collaborators at Northeastern University, Lawrence Livermore National Laboratory, CUNY Community Colleges, regional 4-year colleges, and industry. In terms of research, the CABS team investigates novel battery chemistries, materials, and concepts for use in robotic spacecraft aimed at enabling new and ambitious planetary science missions. In addition to vetting emerging battery technologies for NASA JPL, the team also investigates battery chemistries already under development by JPL for future missions (e.g., Venus aerobot) or mission concepts (e.g., Europa Lander). In terms of education, CABS supports in-depth research-based internships for CCNY undergraduate and Ph.D. students at NASA Centers, including six-month doctoral internships at JPL, as well as student exchanges between CCNY and other collaborating institutions. CABS has also invested in research infrastructure that enables new experimental capabilities and student training opportunities, including equipment for electrochemical battery testing, electrode preparation, environmental testing of devices, 3D printing, calorimetry, and spectroscopy.

“We’re enthusiastic about the next two years: we have significant research momentum across various battery technologies, ranging from those to be used in future NASA JPL missions to emerging chemistries being vetted for future consideration to the development of advanced manufacturing capabilities here at CCNY. Meanwhile, we will send students from the undergraduate to doctoral levels to NASA Centers and beyond, providing them with a once-in-a-lifetime opportunity for scientific and personal growth,” said Prof. Messinger.

CABS will continue to create unique research and educational opportunities for CCNY students and faculty. The ChE faculty will leverage CABS to further grow CCNY and GSOE’s strengths in innovative battery research and manufacturing, strategically positioning the department for other large-scale funding opportunities.

NIH Grant Awarded to Prof. Gilchrist to Investigate the Racial Disparities of the γ-secretase/Notch Pathway and Inhibition in Triple Negative Breast Cancer

In collaboration with the lab of Dr. Yueming Li of the Chemical Biology program at Memorial Sloan-Kettering Cancer Center (MSKCC), the Gilchrist Lab secured a 2-year, $345k NIH grant, funded through the CCNY-MSKCC Partnership, a collaboration between The City College of New York and Memorial Sloan Kettering Cancer Center. The goal of the partnership is to improve the understanding of cancer health disparities and of their impact on socioeconomically disadvantaged populations, including racial and ethnic minority groups. It is funded by the National Cancer Institute’s U54 program, an initiative that develops partnerships between minority-serving institutions and leading cancer centers.

The mortality from triple negative breast cancer (TNBC) in African American (AA) women is higher than in European-American (EA) women. Recent studies have indicated that Notch signaling plays an important role in this racial disparity. “We are investigating how the enzyme γ-secretase plays a major role in the control of Notch signaling in TNBC and contributes to this racial disparity” said Prof. Gilchrist. At this point, ethnic differences in Notch signaling and its role in the higher incidence and poorer outcomes of African-Americans from TNBC remain understudied. This research is intended to elucidate the mechanism underlying potential racial disparities at the molecular level. Accomplishing the aims in the proposal will facilitate the first-ever examination of racial disparities in Notch and γ-secretase pathways and could lead to the basis for racially-distinct therapeutic strategies based on γ-secretase inhibition characteristics.
To leave a gift in your will, simply share this sentence with your attorney or financial planner:

“I bequeath $______ or ____% of my estate to the Department of Chemical Engineering, CCNY, Steinman Hall, T322, 140th Street & Convent Avenue, New York, NY 10031.”

If you are interested in contacting Dane, he can be reached via LinkedIn (https://www.linkedin.com/in/dane-christie-99012936/) or e-mailed at: christied@corning.com.