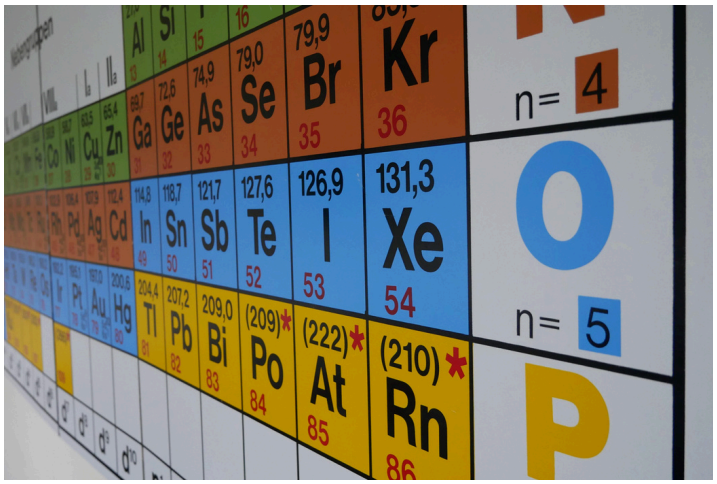
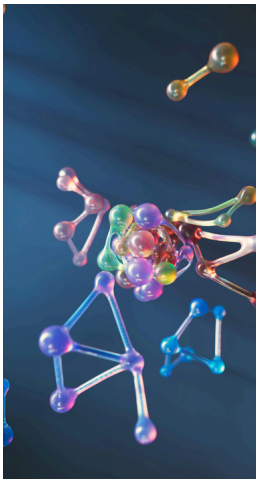
COLUMBIA CHEMISTRY DEPARTMENT PRESENTS

CHEMISTRY NEWS

FALL 2025





COLUMBIA|CHEMISTRY

Welcome from the Chair

Dr. Laura Kaufman

Dear Columbia Chemistry Alumni and Friends,

As the summer comes to a close and the Fall semester gets underway, I'm delighted to share some updates from the Department of Chemistry.

Welcoming New Faces

On July 1, we welcomed Diptarka Hait as a new Assistant Professor in our department. Dip is a theoretical chemist who is currently jointly appointed at Columbia and The Simons Foundation's Initiative for Computational Catalysis, co-directed by Columbia Associate Professor Timothy Berkelbach. We are so happy to welcome Dip and look forward to his contributions to our strong theoretical chemistry program.

We have also recently welcomed our new first year graduate students who are eager to start their classes (both as students and teaching assistants!) and explore the research opportunities in the department in advance of selecting their research mentors late in the Fall. It's always inspiring to see new graduate students' passion for chemistry and their eagerness to integrate into and bring new ideas and energy to our department and field. Finally, new and returning undergraduate students will be filling Havemeyer and Chandler in the days to come – we look forward to seeing them thrive in our classrooms and labs over the next months and years.

Research Updates

Our faculty and students continue to engage in impactful research across diverse areas. While it was a challenging year for Columbia and science funding more broadly, our faculty have continued to receive funding from federal sources as well as foundations and industrial partners. We have all been forced to consider how best to maintain and grow our research programs in a challenging financial environment, and our faculty have responded with creativity and focus to identify and win support for both traditional areas of study and collaborative, cross-disciplinary work and student training.

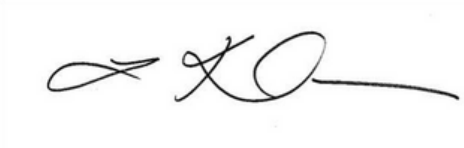
Alumni Connections

We are incredibly proud of our alumni and the paths you've taken - in academia, industry, and beyond. Your achievements are a source of inspiration to our students! If you're interested in sharing your experiences or offering career guidance, please do reach out to us at **chemistry@columbia.edu** and we will connect you to our active Columbia Chemistry Career Committee.

Thank you for your continued support of the Department of Chemistry. Whether through mentoring, donations, or simply staying in touch, your involvement helps us nurture the next generation of chemists.

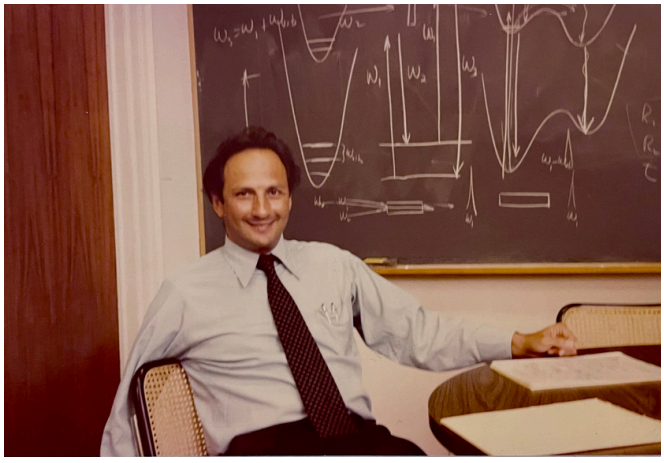
Wishing you a productive and colorful fall season.

Warm regards,



Laura Kaufman

Columbia Chemistry celebrated the life of Professor Kenneth B. Eisenthal (1933-2024) with a memorial service on Friday, July 11, 2025 in Havemeyer Hall.



Meet Assistant Professor Diptarka Hait

Sheila Skaff: To begin, could you tell us a bit about your background and how your interest in chemistry evolved?

Diptarka Hait: I grew up in India where, as a little kid, I thought that colors were very interesting. I became fascinated by colors sometime in kindergarten and my mom took the opportunity to tell me that if I wanted to study colors, I would have to study chemistry. What really happened, though, was that I had some great high school teachers who cultivated my interest in chemistry. They were willing to teach me things beyond the standard curriculum after hours when I asked for it. I also participated in the International Chemistry Olympiad during high school. I did that for three years and through it got to meet an extended network of aspiring chemists from all around the world.

Skaff: Where did the International Chemistry Olympiad take place?

Hait: I participated for three years (2010-2012) when it was held in Tokyo, Ankara and Washington D.C. It was fun. It was good to be able to travel to different places and meet a lot of different people. And at that point, after the Olympiads, I was reasonably confident that I would like to pursue chemistry as a major in college. That experience basically got me locked into the path.

Skaff: Where did you go to college?

Hait: At MIT. (Massachusetts Institute of Technology), right up in Boston. That's how I got used to the cold and found out that like I actually like it better than the summer heat.

Skaff: And then after MIT, what did you do?

Hait: I went to grad school at University of California, Berkeley, and then went on to be a Stanford Science Fellow. Not much snow over there, so glad to be back to the northeast again.

Skaff: Do you get back to India a lot, or is your family still there?

Hait: My family's still there. I haven't gone back since 2019 because there was COVID and then my work as a post-doc. I put it off because everything was too chaotic.

Skaff: Do you remember your first childhood chemistry experiment?

Hait: I do. It was mixing HCl with iron nails to make hydrogen. I remember this because some of the ferric chloride ultimately spilled over and I had to paint the wall back to its original color. Then there were other things I played with subsequently, but that particular experience certainly calibrated my expectations towards how good I would be in doing experiments down the line, which is why I'm now a theoretician who sits in front of the computer and tries hard to avoid coffee spills.

Skaff: What are you working on now?

Hait: Right now, I'm quite interested in trying to model how chemical reactions can happen with light. When a molecule absorbs light, it can excite its electrons to higher energy levels, which can lead to a lot of interesting reactions that would not normally happen in the absence of light. Photosynthesis would be the best known example of such a reaction, but there are lots of other reactions that occur in the fields of photochemistry and photocatalysis. I want to study how these reactions occur and specifically how electronic excited states play a role in these reactions because they are very different from how we would expect molecules to behave in the electronic ground state: bonds fall apart more easily and charges separate more easily and things in general happen much, much faster. And that's so interesting.

Skaff: Are there practical applications?

Hait: Lighting materials, for instance. If you want to design better OLEDs, the target there would be that you send an electrical current, get the material to an excited state, and have it stay in the excited state long enough to emit a photon and relax back to the ground state. And that photon would have to be in the visible range. So, the objective is to increase excited state lifetimes while making sure that the current is exciting the material to the right energy level so that we can get the right range of colors to make display possible. Getting blue is a lot harder than red or green. With computation, we can help create better lighting materials. And there's photochemistry and photocatalysis - synthesizing drugs require a lot of energy, heat and such. The direct conversion of light to energy comes into play. This is fascinating.

Skaff: Tell us a little bit about why you wanted to come to Columbia. I know you like the weather, right? What else drew you to the school?

Hait: Columbia has been on my radar for a very long time, since I was perhaps in middle school. As I got increasingly into research and learned more about the field, I discovered that there's a very great community of chemists, especially theoretical chemists, here. Columbia Chemistry is a very, very strong theoretical program. I encountered Columbia Chemistry alumni everywhere: at conferences, as coworkers or collaborators etc. So, this is indeed one of the best possible places to do theoretical chemistry research.

Skaff: Could you tell us a little bit about how you spend your free time? Anything you're looking forward to doing in New York City?

Hait: I must explore a bit more and check out the American Museum of Natural History. In terms of what I used to do outside of work in California, I often went hiking. That might be a little bit tricky here.

Skaff: There’s great hiking one hour north of us. You can take Metro North to Cold Spring or Beacon or go to Harriman State Park to hike.

Hait: I will check it out. Right now, I'm just mostly reading in my spare time. Just non-chemistry things, mostly stuff related to history. I like reading a lot, so having a chance to get some reading about the seventh century done while things are quiet in the summer is nice.

Meet Associate Professor Milan Delor

Could you tell us a bit about your background? How did your interest in chemistry evolve?
I was born in Nice, France, but I moved to Reunion Island (a French island in the southern Indian Ocean near Madagascar) when I was two years old. What a great place to grow up - I liked school, but I spent more time scuba-diving, bodyboarding, sailing and trekking. This is probably where my interest in science started to evolve: The island is extreme in many ways, with remarkable marine biodiversity, very large waves (Reunion is regularly featured in world surfing competitions), a highly active volcano that I was lucky to see erupt twice from what would be considered unsafe distances today, and untouched wilderness in the center of the island. I think that being exposed to these elements and dynamic environment cultivated a deep curiosity in me as I sought to explain what I experienced.

Do you remember your first chemistry experiment?
Probably mixing sodium bicarbonate with vinegar in a corked test tube with my brother when I was a kid to see how far we could get the cork to travel as it popped. Perhaps an early sign we would end up liking champagne.

Where did you study? (high school, college, graduate school) At what point did you decide to focus on chemistry?
I moved around a lot after Reunion, spending some fantastic years in China (Shanghai and Suzhou) where I went to high school. I completed higher education in the UK. My undergraduate major at Leeds University was Physics, where I also did an integrated Masters in theoretical astrophysics. Although I loved astrophysics, I wanted to switch to a field with more tangible benefits, and I was very interested in emerging energy technologies. This is why I turned to experimental physical chemistry for my PhD, which I completed at the University of Sheffield in the group of Julia Weinstein. There, I used advanced molecular spectroscopy to study and control artificial photosynthetic systems that were promising candidates for converting sunlight, water and carbon dioxide into fuel.

Why Columbia?

After my PhD in the UK, I moved to UC Berkeley for a postdoc. I had a blast developing new microscopes and studying energy flow in new materials in the group of Naomi Ginsberg. My perspective on research changed dramatically there - by leading several projects on different topics to fruition, I felt that with sufficient resources and great mentorship, the research enterprise in the US provided the framework needed for major and impactful breakthroughs. So I decided to pursue a faculty position in the US. When visiting different universities during my job applications, Columbia immediately stood out as the most collaborative institution. That was particularly salient with the interdisciplinary materials research going on here across chemistry, physics and engineering departments. I had never seen such fluidity between labs, with graduate students and postdocs being co-advised and learning from many different groups, and a complete lack of disciplinary boundaries. This aspect, combined with the remarkable concentration of expertise in quantum science at Columbia, has made this institution undeniably world leading in materials research. Anyone familiar with Columbia's materials research community knows that it's truly unique. I'm so grateful to be part of this community now, which has allowed my group to successfully address major scientific questions that I would not have been able to address anywhere else. I also immediately felt at home when interacting with members of this department during my visits; and as I predicted, I have benefited tremendously from the mentorship and support of my colleagues in the department, ranging from other junior faculty, to incredible mentors and collaborators, to Nobel laureate Louis Brus whose lab space my group is now fortunate to occupy.

Tell us about your lab. What are you working on?

A unifying goal of our research is to realize lossless energy and information flow in materials and molecules. The importance of achieving this grand goal of physical chemistry cannot be overstated - success would enable computer chips that could operate 1000 times faster than our current hardware, solar panels that could double their current efficiencies, and materials that could act similarly to superconductors (conducting electricity with zero resistance) at room temperature. We address this challenge by forcing interactions between different components in a material or molecule (for example, between electrons and sound waves or light). On the day-to-day, we develop new microscopes to directly visualize how energy flows with very high spatiotemporal resolution, and study new materials and molecules under different conditions to realize unprecedented energy transport phenomena.

How do you see your lab growing in one, five and ten years?

I hope to maintain the lab's current size of 10-16 members in the next few years as we continue to pursue forefront and curiosity-driven research in physical and materials chemistry. Nevertheless, there is deep and unsettling uncertainty surrounding the research enterprise in the US at the moment, so this question is particularly difficult to answer at this time.

You've recently been named a 2025 Sloan Research Fellow by the Alfred P. Sloan Foundation and a 2025 Camille Dreyfus Teacher-Scholar by the Camille & Henry Dreyfus Foundation. Could you tell us about each of these awards?
I'm honored to have received these early-career awards that recognize creativity, innovation, research accomplishments, and a commitment to education. Even though these types of awards are awarded to principal investigators, they're really a testament to the whole research group's success. I have been fortunate to work with an exceptionally talented group of students and postdocs who are brave, curious, and have continued to push the boundaries of science.

How do you enjoy spending your time when you are not in the lab?
My wife and I love exploring the city's restaurants, parks and museums, taking very long walks in the city and beyond, and going to NYC jazz clubs. I would like to have more time to play guitar, read novels, and explore national parks.

Alumni News

The 2025 GSAS Dean's Award for Distinguished Achievement was presented to Gregory Lawrence Verdine (’86 PhD, Nakanishi Group), a pioneer in the field of chemical biology, a serial biotech entrepreneur, and a life science venture capitalist.

2025 Hertz Fellowship Recipient

Suraj Chandran

The Hertz Fellowship is awarded annually to the nation's most promising graduate students in science and technology.

Suraj Chandran is a doctoral student in the chemical physics program working under the mentorship of Dr. David Reichman. He is broadly interested in quantum dynamics; in particular, he is interested in how collective quantum phenomena can influence chemical reactivity in disordered systems, at material interfaces, and at functionalized surfaces. He chose to attend Columbia primarily for the chemistry department's strong research programs in materials chemistry and its tight-knit, collaborative environment.

Chandran received his bachelor's degree in chemistry and mathematics from the University of Pennsylvania in 2023. During his undergraduate career, he worked with Dr. Joseph Subotnik to investigate how the chiral-induced spin selectivity effect may be mediated by the interplay between molecular vibrations and spin-orbit coupling. Working in the context of a two-state electron transfer model, he demonstrated that nonequilibrium spin-polarization can emerge in a symmetry-dependent manner, even at the lowest level of perturbation theory.
While at Penn, Chandran was also a member of Penn Electric Racing, where, as battery systems lead, he led the development of novel computational pack sizing strategies to maximize the performance of a formula-style electric race car. Following graduation, he took his diverse skill set to AND Battery Aero, an early-stage battery technology startup, where he worked to bring next-generation lithium cell technologies to commercial viability. His primary focus during his time there was addressing unique mechanical challenges using novel computational design strategies.

Outside of work and research, he enjoys trying new coffees, playing the violin, hiking, and rock climbing.

Departmental News and Awards

Associate Professor Timothy Berkelbach has won the 2025 American Chemical Society Award in Pure Chemistry.

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Associate Professor Milan Delor was named a 2025 Sloan Research Fellow by the Alfred P. Sloan Foundation.

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Professor Ruben Gonzalez has co-authored, “The mechanism of mRNA cap recognition,” published in *Nature.*

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Professor Dalibor Sames has co-authored, “Structural pharmacology and therapeutic potential of 5-methoxytryptamines,” published in *Nature.*

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Professor Xavier Roy has co-authored, “Two-dimensional heavy fermions in the van der Waals metal CeSiI,” published in *Nature.*

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Professor David Reichman has been elected to the National Academy of Sciences.

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Associate Professor Milan Delor has been named a 2025 Camille Dreyfus Teacher-Scholar by the Camille & Henry Dreyfus Foundation.

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Professor Xavier Roy has been awarded a 2025 Brown Investigator Award by the Brown Science Foundation.

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Departmental News and Awards

Associate Professor Neel Shah and graduate student Ziyuan Jiang have co-authored, "Deep mutational scanning of the multi-domain phosphatase SH2 reveals mechanisms of regulation and pathogenicity," published in *Nature Communications* (2025, in press).

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Associate Professor Neel Shah has received a 2025 National Science Foundation CAREER Award.

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Associate Professor Neel Shah, Professor Tomislav Rovis, and graduate students Christopher W. Lamartina, Cassandra A. Chartier and Jillian M. Hirano co-authored, "Crafting Unnatural Peptide Macrocycles via Rh(III)-Catalyzed Carboamidation," published in the *Journal of the American Chemical Society* 2024.

***

Associate Professor Neel Shah and graduate students Cassandra A. Chartier and Ziyuan Jiang co-authored, "The pathogenic T42A mutation in SHP2 rewires the interaction specificity of its N-terminal regulatory domain," published in the *Proceedings of the National Academy of Sciences* 2024.

***

Associate Professor Neel Shah, Professor Ann McDermott, and graduate students Cassandra Chartier and Andrew Johns have co-authored, "Allosteric regulation of the tyrosine phosphatase PTP1B by a protein-protein interaction," published in *Protein Science* 2025.

Congratulations to our Student Awards Winners

Columbia Chemistry celebrated its 2024 student award winners with an awards ceremony and reception on May 13, 2024.

The winners of the 2024 graduate student awards include:

The Hammett Award
Liang Li

The Pegram Awards
David Cabanero
Julia Dorsheimer
Wendy He
Christie Koay
Victoria Posey
Baiyu Qiu
Petra Shih
Yizhuo Yang

The Jack Miller Awards
Sean Bryant
Johnson Dalmieda
Haoyu Jiang
Jimmy Kyaw
Erick Morgan
Pavan Ravindra

The Dr. Katherine Lee Chen Graduate Chemistry Fellowship
Joseph Hammer

Arun Guthikonda Memorial Fellowship
Minhee Lee

The winners of the 2024 undergraduate student awards include:

The Richard Bersohn Prize
Clyde Rypins

The Thomas J. Katz Prize
Adam Haig

The Brian Bent Award
Emiliya Akhundova

The Chandler Society Award
Miriam Aziz
Styvalizh Uribe

Gray and Einsenberg Undergraduate Travel Fellowship
Erik Trebilcock

The winners of the 2024 Chemistry Department Service Awards include:

Cassandra Chartier
Jesse Gray
Joseph Ulichny

Congratulations to our Student Awards Winners

Columbia Chemistry celebrated its 2025 student award winners with an awards ceremony and reception on May 19, 2025.

The winners of this year's graduate student awards include:

The Hammett Award:
Ding Xu

The Pegram Awards:
Xin Gao
Joseph Hammer
Ziyuan Jiang
Iris Mercer
Naixin Qian
Jack Tulyag

The Jack Miller Awards:
Loren Cardani
Diana Chamaki
Cyrus Chan
Tyler Chong
Jillian Hirano
Andy Hoang
Luke Lackovic
Gulnihal Tomur

The Dr. Katherine Lee Chen Graduate Chemistry Fellowship:
Jordan Cox

The Arun Guthikonda Memorial Fellowship:
Haoyu Jiang

The Moloy and Metzger Research Fund Summer Fellowship
Sean Bryant
Yoon Nah
Ran Yan

The winners of this year's undergraduate student awards include:

The Richard Bersohn Prize
Davis Smith

The Thomas J. Katz Prize
Tyler Shern

The Brian Bent Award
Carlos Johnson

The Chandler Society Award
Vinicius Avelar

The winners of the 2025 Chemistry Department Service Awards include:

Vinicius Avelar
Mariah Carol Ramos

COLUMBIA | CHEMISTRY

Proudly presents

The 38th Annual Student Awards

Recognizing excellence in teaching, research and service

- Hammett Award
- Pegram Awards
- Arun Guthikonda Fellowships
- Kathy Chen Fellowship
- Miller Awards
- Bent Awards
- Chandler Society Awards
- Undergraduate Research Awards
- Service Awards

Monday, May 19, 2025 at 3:00pm

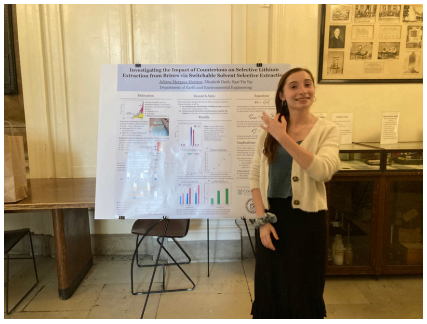
209 Havemeyer

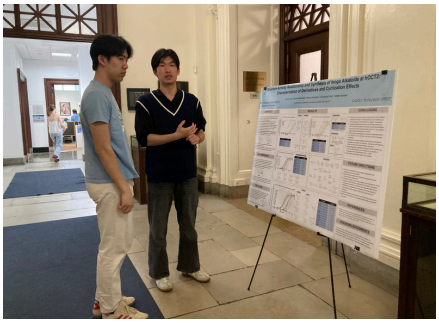
Cake and Champagne to Follow in 7th Floor Lounge

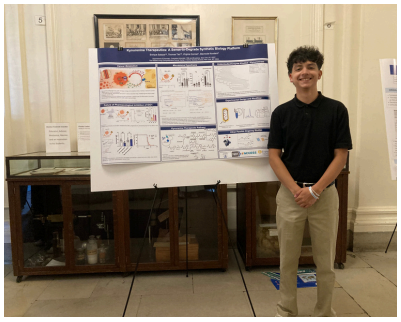
Awards Ceremony 2025

Department Life

May 1, 2025
Undergraduate Poster Session







May 20, 2025
Celebrating our Columbia College Graduates

Department Life

JOIN US!

Send an email to **chemistry@columbia.edu** to join the alumni mailing list, and find Columbia University Department of Chemistry on Linkedin, Facebook and Twitter!

STAY IN TOUCH!

Share your important updates and experiences in your career and life after Columbia! Send an email with your updates to our Administrative Coordinator, Sheila Skaff, at sms2281@columbia.edu, or to our Director of Undergraduate Studies, Vesna Gasperov at vg2231@columbia.edu.