

SKIDMORE

Department of Chemistry



Seniors from the class of 2025

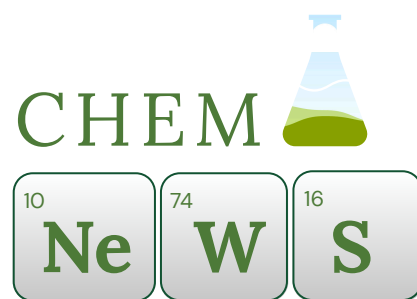
Congrats to Our Recent Grads!

Our 15 new Chemistry and Biochemistry 2025 grads are heading out into the world to make a difference. They'll be expanding their chemistry knowledge in graduate school at the University of Minnesota, UC Davis, Colorado State, Rutgers, and UPenn. Other students intend to work in industry, pursue research and tech positions, and gain medical clinical experience before applying to medical or graduate programs.

Thank You to Our Donors!

We are very grateful for the generous support from our donors to the department. Through these donations, we have been able to support five research students last summer and nine this summer! Keep reading to the last page for a list of benefactors and how you can support Skidmore Chemistry.

Join our LinkedIn group to keep up with more department news. Scan the QR code or visit <https://www.linkedin.com/groups/14579646/> to connect with us.



Summer 2025

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THANK YOU DONORS!

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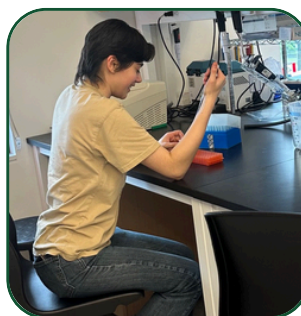
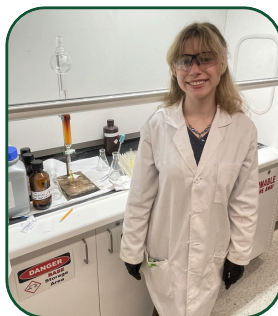
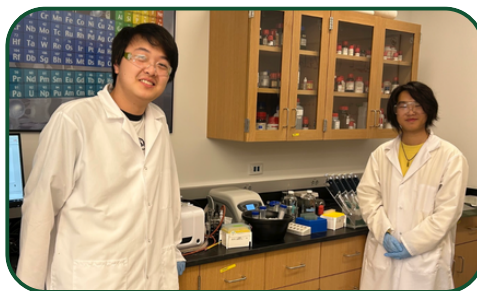
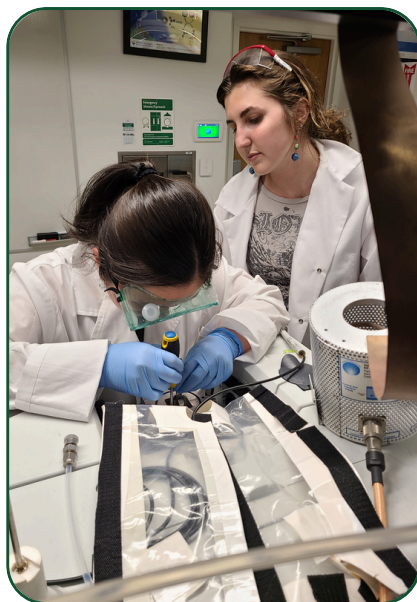
INCOMING FACULTY

CHEM CLUB NEWS

DONOR APPRECIATION

Summer Research Highlights

Bright minds are teaming up over the summer here on the Skidmore campus. Take a peek at the fascinating projects our 42 funded students are diving into during their collaborative research.



FREDERICK GROUP

This summer we are working on microfluidic paper analytical devices (uPADs) for naproxen, aspirin and the antibiotic ceftriaxone using cell phone detection. We are also exploring ways that artificial intelligence might be used to help us better analyze our images. There are 4 undergraduates and 2 high school students representing 6 different countries!

JOKIEL GROUP

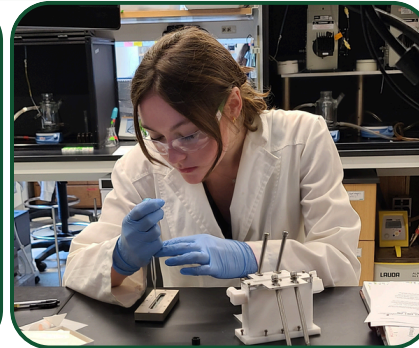
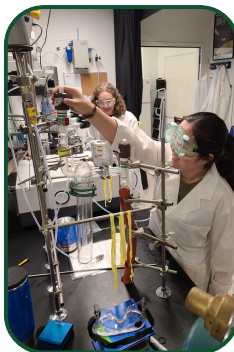
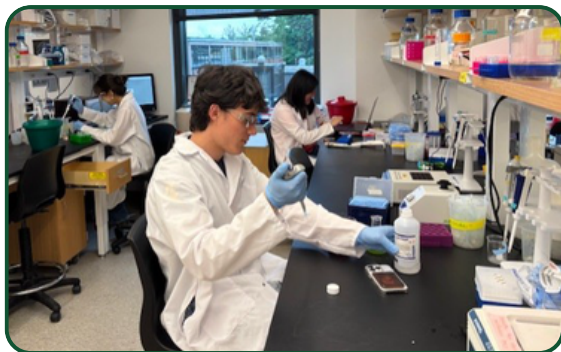
Deirdre and Xiaoran are each synthesizing a collection of druglike heterocyclic organic compounds while optimizing the reaction conditions. Each student is examining the effect of structural modification at a different position. We intend to submit the finished collection for broad-based biological screening.

FREY GROUP

We have made some novel macrocyclic and cryptand ligands this year and have discovered that they form interesting complexes with Mn^{2+} and Cu^{2+} ions. Along with RPI chemist Peter Bonitatibus, we've obtained crystal structures of several of the complexes. We've also examined their aqueous solution state stability and done reactivity studies to demonstrate their ability to serve as antioxidants.

BALL GROUP

We are finishing a project in the lab that examines the effect salt has on a protein binding interaction. This protein is involved in cellular signaling in all eukaryotic organisms, and we are studying it with both computer simulations and, in collaboration with the University of Minnesota and University of Liverpool, using NMR spectroscopy. We can see that salt disrupts the electrostatic attraction of the proteins and students in my lab are now figuring out which part of the binding process is affected the most by salt.



NAVEA GROUP

This summer, the Navea research group is studying how chemical reactions occur on the surfaces of atmospheric aerosol particles—tiny solids or droplets like sea spray, mineral dust, and soot. We use spectroscopy and computer modeling to investigate how gases interact with these surfaces and how sunlight can drive chemical changes. By understanding these processes at the molecular level, we aim to better predict the role of aerosols in air quality and climate

ROCA GROUP

- Hayes Van Dis is preparing plastic films colored with silver nanoparticles and quantifying the amount of silver during the process using Transmission Electron Microscopy (TEM), UV-visible spectroscopy, and microwave digestion with Atomic Absorption Spectroscopy.
- Rowan McLearn is characterizing the Surface-Enhanced Raman Scattering (SERS) of nicotinamide on various nanoparticles of gold and silver.

RATHTHAGALA GROUP

Our summer research projects focus on understanding how glucan phosphatases contribute to plant starch degradation. We utilize structural biochemistry and advanced microscopy techniques to understand how this enzyme family interacts with the starch granule structure for catalyzing the dephosphorylation reaction.

SHEPPARD GROUP

Our summer research has a few objectives:

- 1) expanding the genetic code of *E. coli* to include pyroglutamate, found in the amyloid beta-peptides associated with Alzheimer's Disease, as a tool for synthetic biology,
- 2) studying aminoacyl-tRNA synthetase tRNA specificity evolution by resurrecting and mutating ancestral gamma-proteobacterial aspartyl-tRNA synthetases to inform potential antibiotic design, and
- 3) investigating why Bacilli encode two distinct route for preparing the amino acid asparagine for protein synthesis.



Prof. Navea with Lyra '25 and Lily '27
at ACS in San Diego

Student Presentations

Our students have been traveling throughout the country to showcase their research progress presenting at:

- National Meeting of the American Chemical Society, San Diego, CA and Washington DC
- National meeting of the American Society for Biochemistry & Molecular Biology, Chicago, IL
- Biophysical Society Annual Meeting, Los Angeles, CA
- Middle Atlantic Regional Meeting of the American Chemical Society, Pennsylvania State University
- Eastern New York Section of the ACS Undergraduate Research Symposium
- Regeneron STEM Undergraduate Research poster session



Prof. Frey with chemistry students
in the wild

Alumnus Spotlight



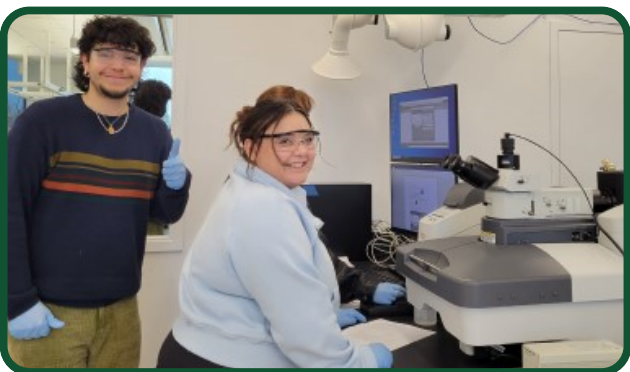
Mathew Walsh '13, who recently defended his Ph.D. dissertation at Johns Hopkins University, spent the day with us on April 23rd where he met with the Senior Seminar class to talk about his career path, spoke with faculty about how to prepare our students to work with artificial intelligence, and gave a talk entitled "Responsible Development of Artificial Intelligence in the Life Sciences: From Policy to Practice." Both the students and faculty enjoyed connecting with Matt and catching up on his life since graduating from Skidmore.

Support our students

We sincerely appreciate alumni participation in student networking and mentorship. If you're interested in becoming involved, please contact the chair, Prof. Lia Ball, at kball@skidmore.edu.

Instrumentation Update - Chem Dept with SAIL

RAMAN MICROSCOPE



Raman Microscope

The Raman microscope (Thermo Scientific DXR3) was installed in the Fall of 2023 as part of the Sherman-Fairchild grant. In this technique, a sample is illuminated and inelastic scattered light is analyzed to identify functional groups that produce signals at characteristic frequencies. This nondestructive technique, allows mapping of the consistency of a deposited film or analysis of multiple layers of different polymers within a plastic film. Since its installation, the microscope has been used for research, Prof. Roca's nanochemistry class, and a Classics course analyzing archaeological artifacts.

ELEMENTAL ANALYZER

The elemental analyzer (Thermo Scientific FlashSmart), installed in Fall 2024, has been used by Professors Frey and Navea labs, as well as in the Analytical Methods class, CH 232. The instrument gives the percent composition of carbon, hydrogen, nitrogen and oxygen. In a pure compound, this can help elucidate a chemical formula and provide qualitative confirmation of a reaction product. Between both these instruments, faculty and students have conducted research in areas of nanochemistry, synthetic chemistry, atmospheric chemistry, surface chemistry, and photochemistry.



Elemental Analyzer

Celebrating Student Awards



We've been celebrating all our amazing students who've wowed us with their brilliance and academic talent this year!

- Rachel Hambuchen '26 was awarded the prestigious national Barry Goldwater Scholarship and Excellence in Education award, which is offered to students who show exceptional promise of becoming this Nation's next generation of research leaders in the natural sciences, engineering, and mathematics. Rachel is among four Skidmore chemistry research students to win over the last five years, including Natasha Wozniak '25, Adriana Cuius '24, and Heather Ricker '22.
- The ACS Division of Colloid and Surface Chemistry selected Elizabeth Scholer '24 as a COLL-PUI awardee for her undergraduate research modeling the atmospheric processing of particles in the ocean atmosphere in Prof. Navea's group.

Our incredibly strong and highly involved senior students were chosen for the following awards:

- Charlotte W. Fahey Prize to Ruby Epstein and Cormac Feeley
- ACS Awards
 - Physical Chemistry: Lindsey Han
 - Inorganic Chemistry: Cormac Feeley
 - Organic Chemistry: Andrew Shen and Cormac Feeley
 - Analytical Chemistry: Abbey Grandin
 - Biochemistry: Ruby Epstein
 - Chemical Safety and Ethics: Najda Bucan



**Ruby Epstein receiving
Charlotte W. Fahey Prize**

Welcome New Hires!

Assistant Professor Dan Brandes, currently an Arnold O. Beckman Postdoctoral Fellow at the University of Michigan, works in the laboratory of Dr. Melanie Sanford. Dan earned his PhD in organic chemistry at Yale University in 2023, working in synthetic methods development with Dr. Jonathan Ellman. At Skidmore, research in Dan's lab will center on photocatalysis as a tool for synthetic organic chemistry. His research explores the use of organophotocatalysts to a) enable the synthesis of medicinally-relevant pharmacophores and b) to modernize classical organic reactions that typically employ harsh and functionality-incompatible conditions, rendering these methods safer and greener. Dan is very excited to begin at Skidmore this Fall, and will be teaching the first semester of organic chemistry (CH221). In his free time he enjoys improv comedy, playing tennis and swimming, and finding opportunities to meet (and pet) new dogs.

Visiting Assistant Professor Rebecca Thurman earned her PhD in Biochemistry at the University of Arkansas in 2013. Following that, she moved to North Carolina and taught at a private school for over three years. In 2018 she moved with her family to New York state, and in 2022 started working at Schenectady County Community College teaching General Chemistry I and II, Fundamentals of Chemistry, and various biology courses. This fall at Skidmore College she will teach Biochemistry I Lecture (CH 341) and Principles of Chemistry Lab (CH 125).

Chem Club Connecting the Curious

The Skidmore Chem Club brought students together weekly for creative, hands-on activities - from making Boba, lava lamps and pH watercolor paintings to exploring research labs and acing trivia nights. The annual STEM carnival was the highlight, where campus clubs collaborated on science-themed games and events. Follow their adventures on Instagram: @skidchemclub.

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Sara Almansberger

Associate Teaching Professor

K. Aurelia Ball

Associate Professor and Chair

Dan Brandes

Assistant Professor

Lisa Dillenback

SAIL Instrumentation Manager

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Maryuri Roca

Associate Teaching Professor

Kelly Sheppard

Professor

Tracy Stanley

Administrative Assistant

Rebecca Thurman

Visiting Assistant Professor

Visit us at skidmore.edu/chemistry

A Very Gracious Thank You to the Following Donors

The late Donald K. and Jean A. Richards
And their daughter, Dr. Susan Richards McKay
for their significant support of Chemistry Collaborative Research

and to the following alumni, who have given in support of a newly established
Endowed Fund for Chemistry Collaborative Research
in honor of Professor Ray Giguere

Michael Brodney '94 and Marian Davidson Brodney '94
Justin P. O'Leary '94
Michael I. Rose '90
Evan Shalen '08 and Claire Elliott '07

Thank you also to the alumni, parents, and friends
who have made annual or endowment gifts in support of the
Chemistry Department or Collaborative Research in Chemistry at Skidmore

Lauren Bess Adams '06
Barbara Brockman Apai '71
Jasper G. Ballot '20
Ellen Gingras Barkhuff '72
Barbara-Anne Williams Battelle '68
Joe Biilotta '00 and Veronica Bilotta '01
Jaclyn R. Boulais '06
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Dr. Kelly Sheppard
Sarah R. Soltau '07
Drs. Eric J. Weller and Mary Ellen Fischer
Amanda R. Weyerbacher '01
Tina and David Wilson P'25

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