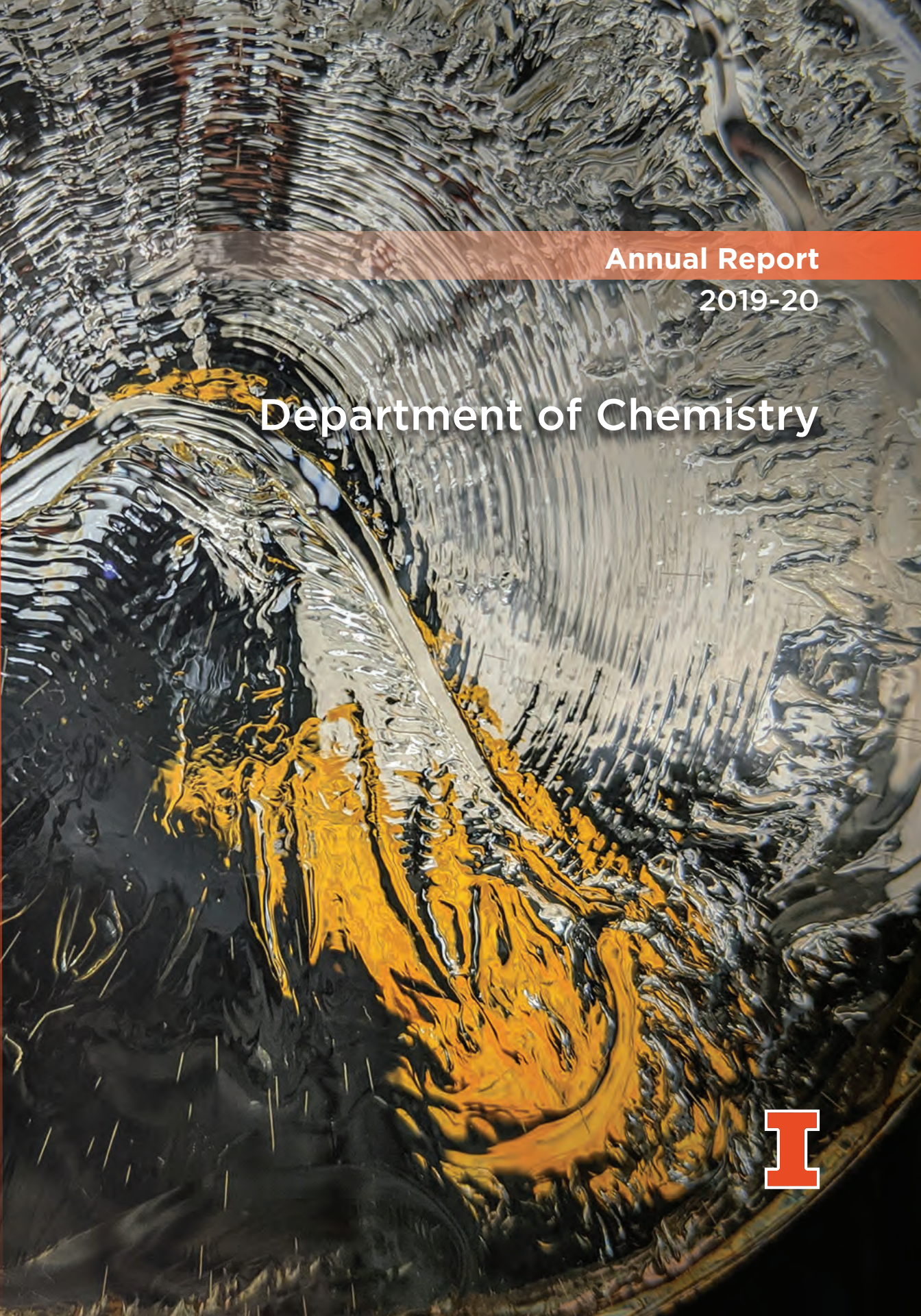


Annual Report

2019-20

Department of Chemistry

CHEMISTRY AT ILLINOIS

The Department of Chemistry endured a challenging yet productive 2019-20. It began with the addition of two new faculty members, Mei Shen in analytical chemistry and Angad Mehta in chemical biology, and continued with alumni and faculty garnering major honors before the pandemic interrupted research and shifted instruction online. We embraced the challenges, implementing new safety procedures, allowing research to resume. Several faculty members launched coronavirus research projects, including developing a saliva-based COVID-19 test that became key in protecting the university community. The department forged ahead, continuing its mission to create new knowledge and educate the next generation of scientific leaders, graduating 239 new alumni, welcoming 59 new graduate students and executing $20.1 million in research expenditures that included 18 U.S. patents issued. As a faculty member and alumna (BS, '86), I was named head of the department this year, the first woman head in our 152-year history. I am looking forward to 2021 and how we can position ourselves for another 150 years of success.

Catherine J. Murphy
Head, Department of Chemistry
Larry R. Faulkner Endowed Chair in Chemistry

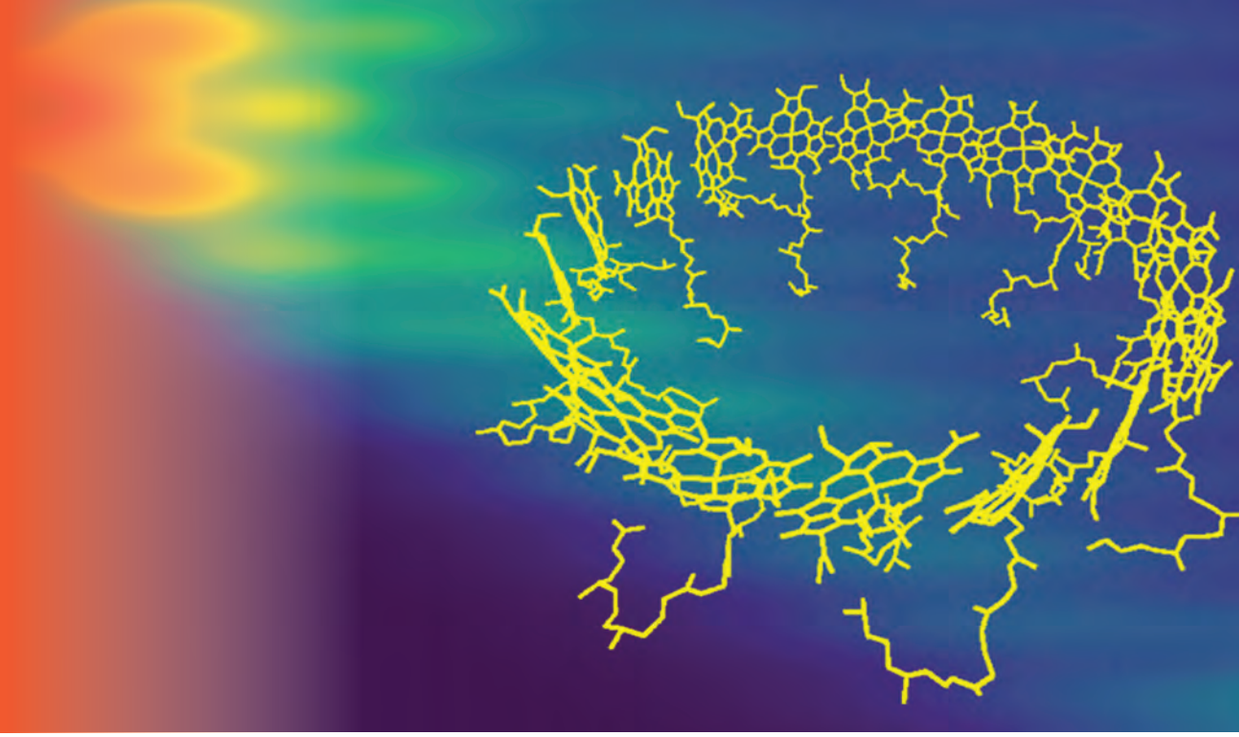


Image: Sohang Kundu

2019-20 **HIGHLIGHTS**

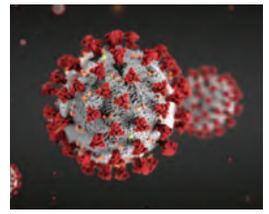
Peixin He (PhD, '85, Faulkner) and Xiaoming Chen receive LAS Dean's Quadrangle Award (August 2019)

Alumni Career Panel, featuring Michael Garst (BS, '69), Christine Herman (PhD, '12, Bailey), Margaret Kosal (PhD, '01, Suslick), and Brock Siegel (PhD, '74, Beak) (October 2019)

Liviu Mirica invested as the William H. and Janet G. Lycan Professor of Chemistry (November 2019)

M. Christina White invested as the William H. and Janet G. Lycan Professor of Chemistry (February 2020)

Paul J. Hergenrother appointed deputy director of the Cancer Center at Illinois (March 2020)



Chemistry researchers launch COVID-19 projects, including development of innovative saliva-based method to test thousands on campus (May 2020)

Documentary on St. Elmo Brady (first African American to earn PhD in chemistry in U.S.) wins a Telly Award (June 2020)

Mei Shen and Angad Mehta join the chemistry faculty (July 2019)

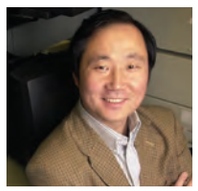
Jeffrey Moore named the Stanley O. Ikenberry Endowed Chair, among the most distinguished honors on campus (November 2019)

Steven Govoni (BS, '88), the vice president of Research, Development and Engineering at Nalco Water, delivers Alumni in Industry Lecture (March 2020)

Philip W. Phillips elected to the American Academy of Arts & Sciences (April 2020)

Cathy Murphy becomes first woman to head the Department of Chemistry (June 2020)

Martin Burke and Yi Lu share presentations on COVID-19 projects in department's first virtual event (June 2020)



Unless otherwise indicated, all data in this report is for 2019-20

ALUMNI

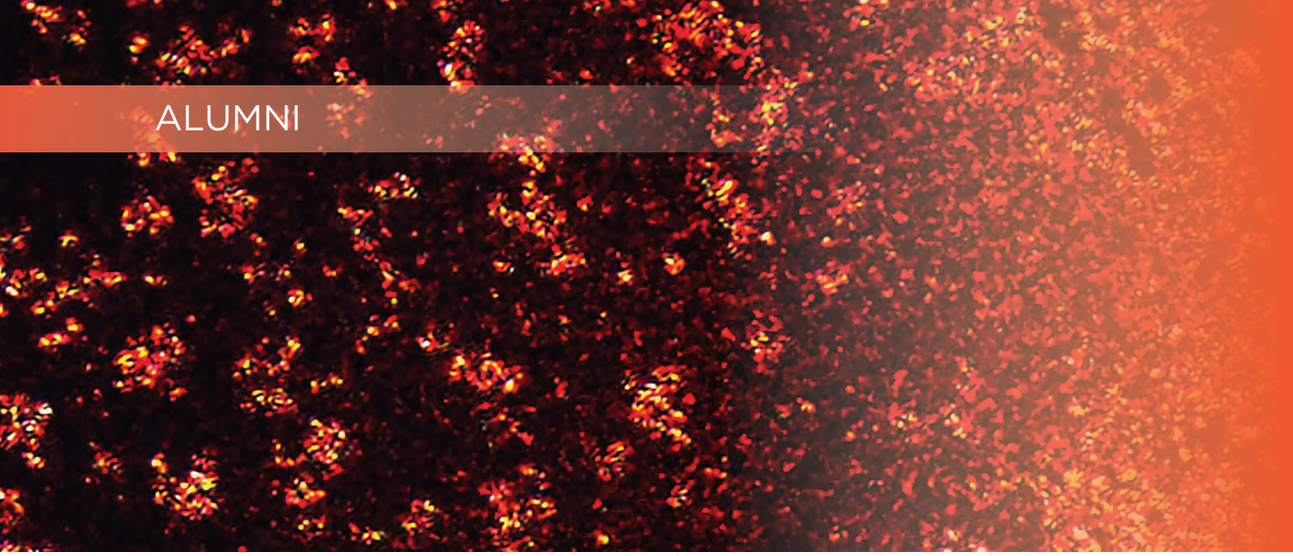
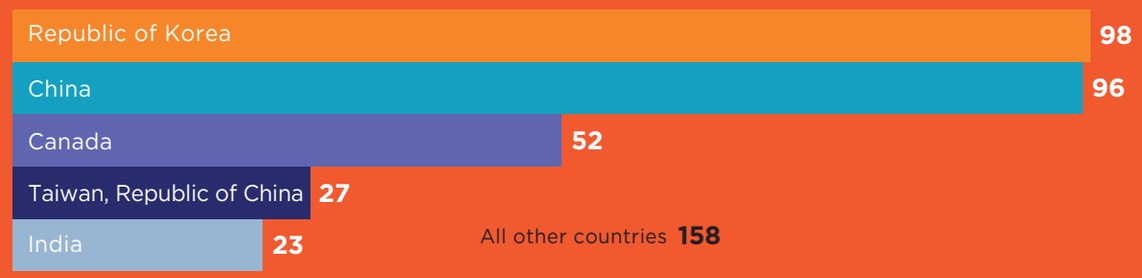


Image: Huei-Huei Chang

9670 ALUMNI FROM 52 COUNTRIES

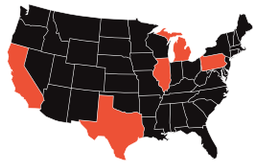
TOP 5 COUNTRIES OUTSIDE U.S. FOR ALUMNI



Chemistry at Illinois graduates land first destinations

After graduation, Elizabeth Murphy (BS, '20) headed west to pursue a PhD in polymeric materials chemistry at the University of California, Santa Barbara — her top choice to further her education and long-term goal to be a research-and-development polymer chemist at a chemical manufacturing company. Data from the annual Illini Success survey (see below) continues to show each year that more than 90 percent of chemistry undergraduates secure their first destination. Murphy said the high level of collaboration between undergraduates, graduate students, postdoctoral fellows, and professors offered meaningful opportunities to do undergraduate research, as early as her freshman year, working in chemistry professor Paul Braun's group on synthesis of a redox-active polymer brush.

"My undergraduate research experience has shaped my career goals, research interests, and the entire way I approach chemistry. Now, I have committed to pursue a PhD at UCSB to work for a top polymer chemist."



TOP 5 U.S. STATES FOR ALUMNI

	#	% of U.S. total
Illinois	3422	36%
California	819	9%
Pennsylvania	334	4%
Texas	320	3%
Michigan	259	3%
Total of Top 5	**5154**	**55%**

GRADUATE SUCCESS

CLASS OVERVIEW	
Secured First Destination	93%
PRIMARY STATUS	
Employed	56%
Continuing Education	37%
Seeking	5%
Other	2%
Volunteer/Service	<1%

FULL TIME EMPLOYED SALARY	
Average Salary	$ 69,824.00
25th Percentile	$ 61,000.00
50th Percentile	$ 69,953.00
75th Percentile	$ 76,000.00

Graduate success data is self-reported and represents a 74% response rate (234 of 317) from those who received an undergraduate degree in 2018-19 from the School of Chemical Sciences (Department of Chemistry and Department of Chemical and Biomolecular Engineering). Visit illinisuccess.illinois.edu for more information.

GET TO KNOW OUR NEWEST ALUMNI

239 graduated 2019-20

62
Graduate Degrees

177
Undergraduate Degrees

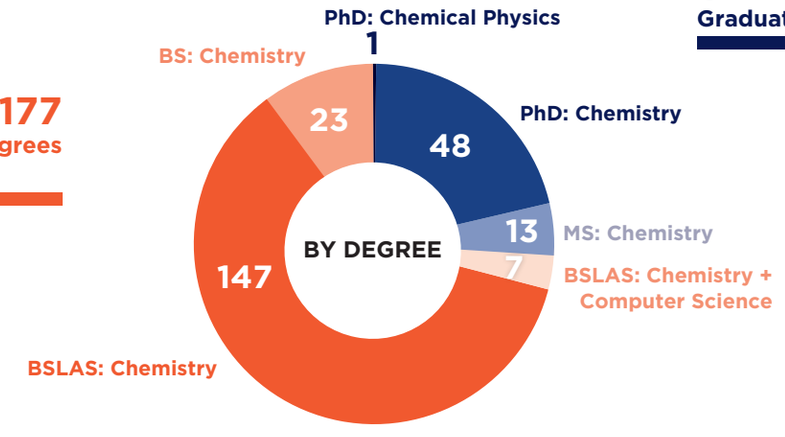
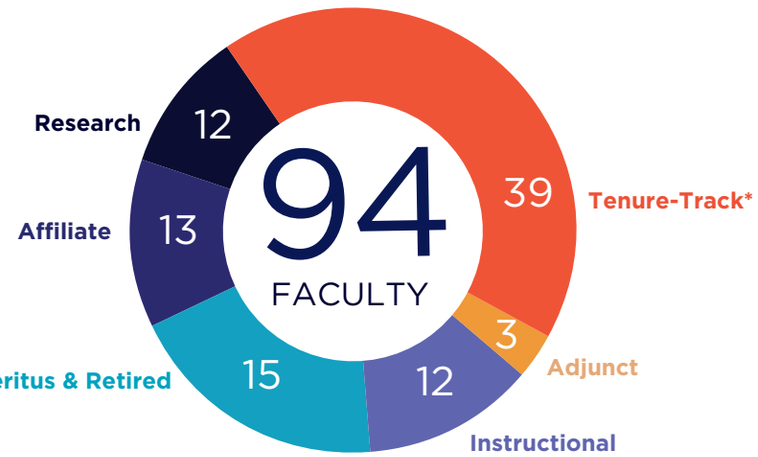


Image: Hyosung An & John Smith

An Interdisciplinary Approach to Research

Chemistry at Illinois has served as a focal point for interdisciplinary research on campus for over 100 years. This past year, Professor Jonathan Sweedler was part of an interdisciplinary team of scientists that discovered Schistosome Paralysis Factor, a compound that could treat schistosomiasis, a parasitic disease, infecting over 200 million people worldwide, mostly in poor, rural areas. Before the parasites enter water where they infect people, the worms live in snails. Some snails contain a microscopic aquatic animal known as a rotifer that prevents those snails from becoming infected. The team discovered the single compound that paralyzed the infectious worms. "All of this suggests this compound, the Schistosome Paralysis Factor, has the capability of being a promising drug candidate," said Sweedler, the James R. Eiszner Family Endowed Chair in Chemistry and director of the School of Chemical Sciences.

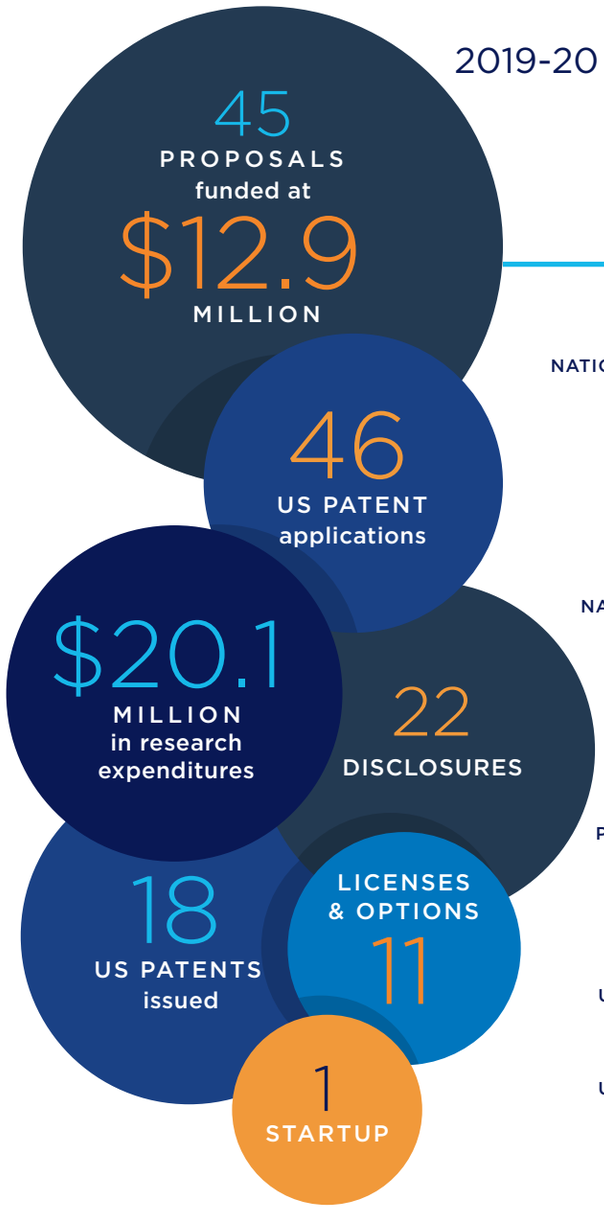


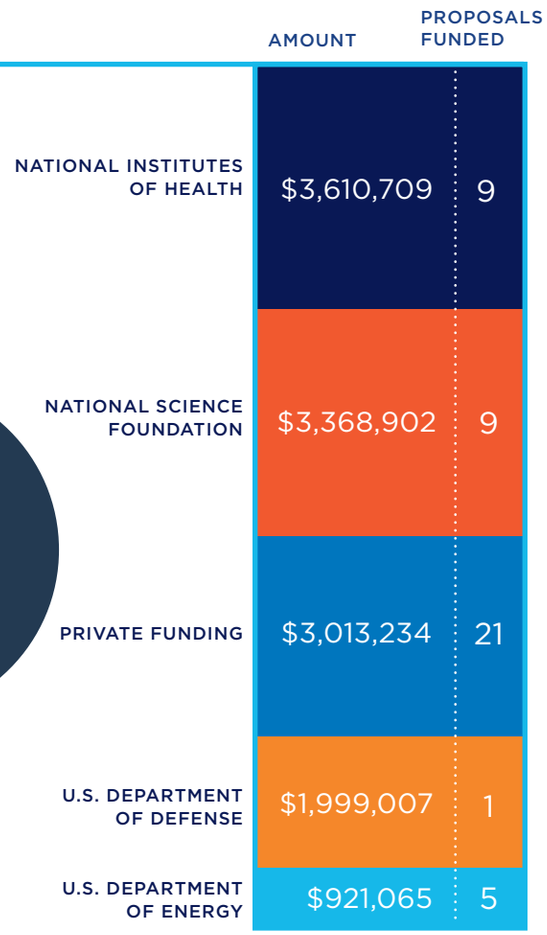
*Includes full- and part-time

TENURE-TRACK FACULTY BY RESEARCH AREA*

*Several faculty conduct research in multiple areas

2019-20 RESEARCH ACHIEVEMENTS





STUDENTS

Sriyankari Chitti began undergraduate research as a freshman at Illinois, working with chemistry professor Martin Burke to develop an iterative method for synthesizing three dimensionally enriched small molecules, inspiring her to major in chemistry and continue her research. A first-generation American, Chitti has successfully written grants to fund her undergraduate research, presented her work nationally and received multiple awards and a national Barry M. Goldwater Scholarship. She also received an American Chemical Society Division of Organic Chemistry summer fellowship awarded to undergraduates pursuing organic chemistry research at their home institution. Chitti has completed four graduate chemistry courses since her sophomore year of college. She now mentors fellow undergraduates in her lab, and as an aspiring future professor, Chitti hopes to develop new methodologies to synthesize drug molecules more efficiently, contributing to the fields of organic chemistry and medicine.

Image: Xuan Zhou

525
undergraduate

104
(20%) participated in research

39
(7%) received a departmental/ donor-funded scholarship

$194,000
awarded in departmental/donor-funded scholarships

292
graduate

FUNDING

40
Full Fellowships

148
Research Assistantships

105
Teaching Assistantships

FELLOWSHIPS (full & partial)

6
Campus

194
Departmental/Donor-Funded

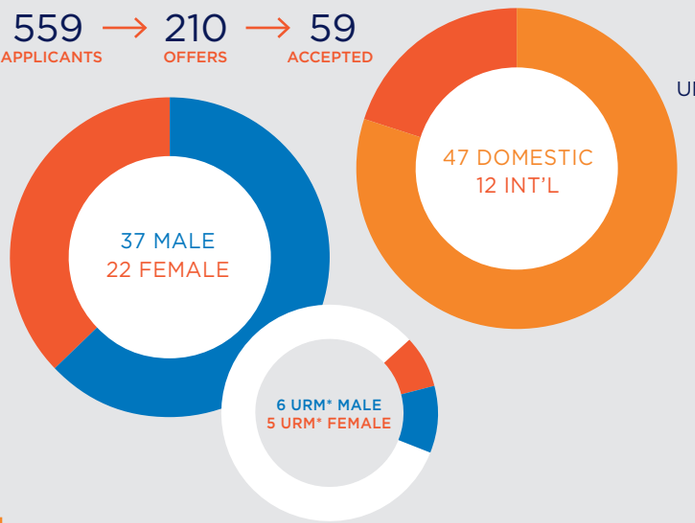
13
External: NSF

3
External: Other

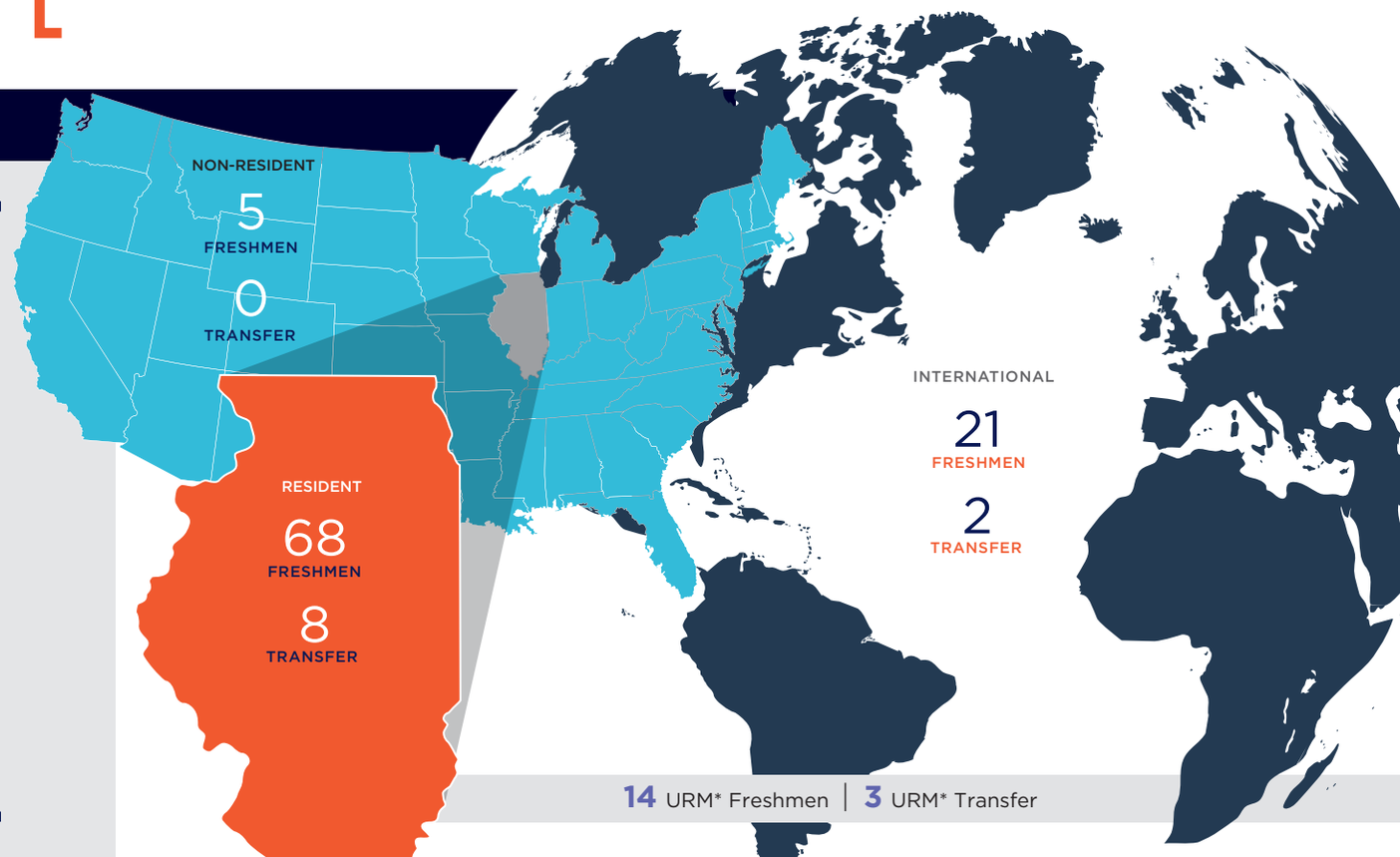
GET TO KNOW OUR INCOMING STUDENTS

59
INCOMING GRADUATE STUDENTS

559 → 210 → 59
APPLICANTS OFFERS ACCEPTED

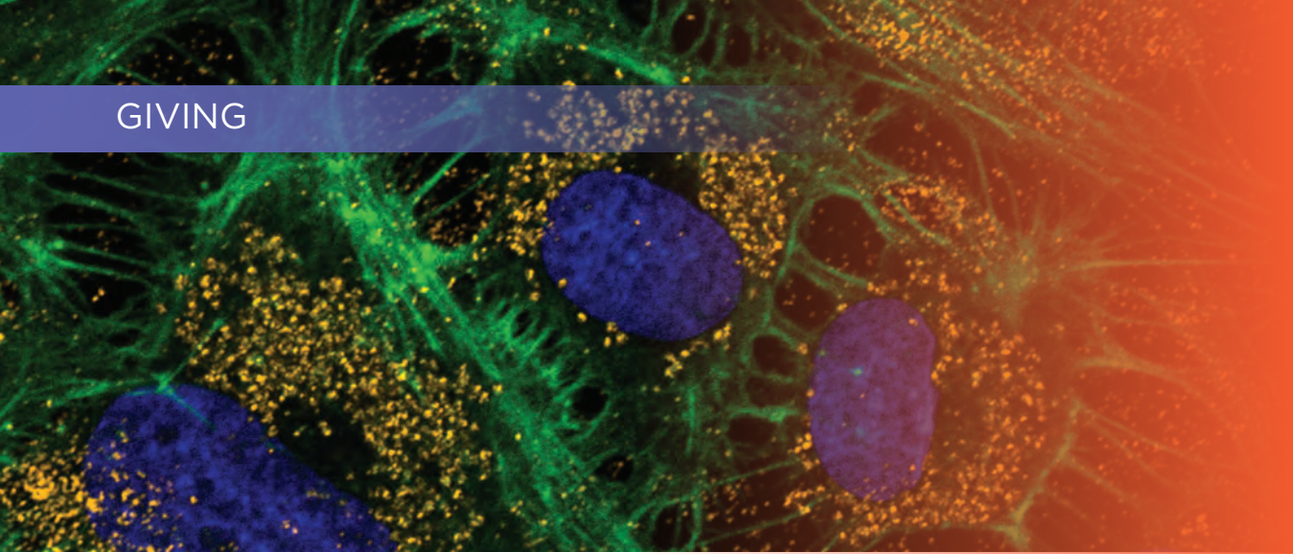


104
INCOMING UNDERGRADUATE STUDENTS



This data is for our newest class of students—incoming in 2020-2021.
**Underrepresented Minority*

GIVING



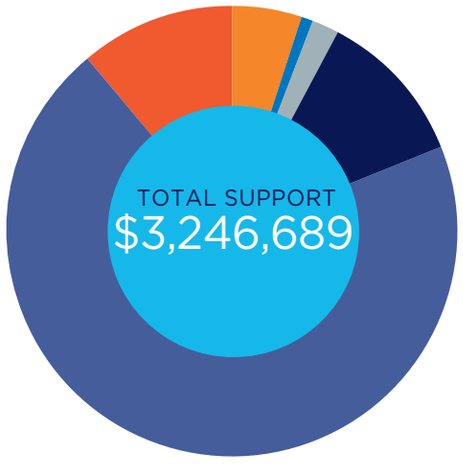
A world-class chemistry program doesn't happen without world-class supporters. Your gifts drive innovative research, educate the next generation of leaders, and improve the lives of millions around the world. We are especially grateful for your support this past year, when even a pandemic couldn't stop your generosity.

Thank you to those who graciously shared their stories here — and to all of you who choose to give. We couldn't do it without you.

For more information about supporting the Department of Chemistry, please visit chemistry.illinois.edu/giving.

Image: Whitney Sinclair

THANK **YOU**



- FACULTY SUPPORT $160,829
- MULTIPLE PURPOSE & OTHER SUPPORT $36,832
- PROGRAM SUPPORT $55,735
- RESEARCH SUPPORT $358,932
- STUDENT SUPPORT $2,272,983
- UNRESTRICTED SUPPORT $361,378

**Does not include payments on major gift commitments made prior to 2019-20.*

13 | **7 endowed, 6 current use**
NEW GIFT FUNDS

386
DONORS

567
GIFTS

NEW **GIFT FUNDS**

Current Use Funds
3M Fellowship Fund in Chemistry
3M St. Elmo Brady Summer Research Scholars Program Fund
Dr. Michael J. Sofia Fellowship Fund
Geoff T. Halverson Memorial Scholarship Fund

Endowed Funds
Barbara H. Weil Fellowship Fund
Dr. Harold R. Snyder Fellowships Fund
Peixin He and Xiaoming Chen Graduate Fellowship Fund
Professor Gregory S. Girolami Undergraduate Scholarship Fund
Janet M. Buhrke and Victor E. Buhrke Chemistry Endowed Fund
Richard G. and Margaret L. Inskeep Fellowships in Chemistry Fund

*Does not include funds set up for direct support of individual faculty or other administrative purposes.

WHY I **GIVE**

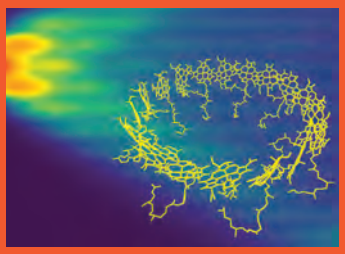
Dr. Dekai Loo (PhD, '87, Beak) and **Dr. Jianjian Zhang** (PhD, '89, Schuster) — "We started our graduate studies in the U.S. in our mid-thirties because of the Cultural Revolution in China. Despite numerous challenges including not speaking any English, we have fulfilled our American dream. Looking back at our journey, the opportunities and support that our PhD advisors, Professor Schuster and Professor Beak, gave us during the most critical time are invaluable. We gave to pay it forward."

Jordan C. Axelson (BS, '10; Lecturer, Department of Chemistry) — "Personally, it's very important to me to give back in ways that I've been helped in the past. I enrolled at the University of Illinois as an undergraduate because it offered me the best financial aid package of all the schools I applied to. Those scholarships allowed me to go to college and to focus on my studies without having to worry about how I was going to pay for my education. Additionally, I attribute much of my academic success and progression to graduate school to specific programs like the Chemistry Merit Program and undergraduate research. I want other students that come after me to be able to benefit from those same opportunities so they can flourish as well."

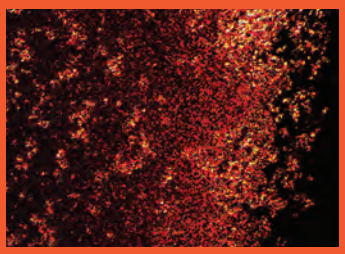
John Witt (PhD, '61, Snyder) and **Margaret R. Witt** — "As Illini, we realize that whatever we were able to do and who we became, both professionally and personally, a large part resulted from being educated, developed, and nurtured at this University. We feel that it is our responsibility and goal that the excellence and quality that exists at the University, Liberal Arts and Sciences, and Chemistry continues and becomes even better. Our efforts have supported both faculty and students to ensure that excellence."

Dr. Burt Renfroe (PhD, '62, Rinehart) — "I was fortunate to have a wonderful chemistry teacher at my undergraduate school who encouraged me to go to graduate school. He was a PhD from U of I and strongly recommended that department. I was even more fortunate to attend and join the research group of Prof. K. Rinehart. We had a great working relationship and my research went well and resulted in Ken's using it for his presentation at the National Organic Symposium that year, 1961. Obviously, all of this was a life-changing experience for me and explains why I give yearly donations to this great school!"

The science images appearing in this report were created by Chemistry at Illinois students, faculty and postdoctoral researchers.



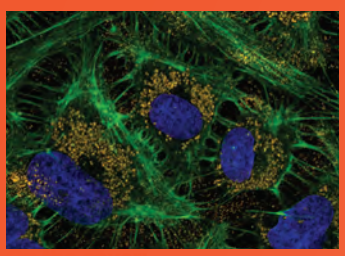
Sohang Kundu (Nancy Makri Group)
Excited state population spread along the B850 ring of light harvesting complex II found in photosynthetic bacteria during the 100 fs following a bacteriochlorophyll photoexcitation.
Image credit: "Real-Time Path Integral Simulation of Exciton-Vibration Dynamics in Light-Harvesting Bacteriochlorophyll Aggregates," *The Journal of Physical Chemistry Letters, 11; DOI: 10.1021/acs.jpclett.0c02760*



Huei-Huei Chang (Catherine Murphy Group)
Dark-field micrograph of gold nanospheres. Gold nanoparticles scatter light and can produce vivid colors under dark-field microscopy. Gold nanospheres were drop-casted on a glass slide. The degree and color of scattering can be turned by varying the distance between each gold nanosphere, forming scattering light of red, orange and yellow.

Hyosung An and **John Smith** (Qian Chen Group)
The scientific illustration of the amyloid beta fibers which are one of the important biomarkers of Alzheimer's disease having the aggregated forms of a peptide. Alzheimer's disease patients have abnormal levels of Aβ in the cerebrospinal fluid and brain tissue.

Xuan Zhou (Dana Dlott Group)
2019 School of Chemical Sciences Science Image Challenge finalist
SEM side-views on a metal-organic framework film before and after shock compression. MOF crystals become less damaged as the shock wave (blue flame) travels deeper, due to the weakened shock strength by void compaction and bond-breakage.



Whitney Sinclair (Deborah Leckband and Paul Kenis Groups)
Gold nanoparticle treatment of lung endothelial cells lead to cytoskeletal remodeling. Using a confocal fluorescence microscope, nuclei (blue), actin cytoskeleton (green), and gold nanoparticles (yellow) can be visualized. Image was taken at the Institute of Genomic Biology Core Facility and gold nanoparticles were provided by Catherine Murphy's laboratory.

On the Cover
Katherine Stawiasz (Jeffrey Moore Group)
2020 Image of Research Exhibition finalist, U of I Graduate College.
This polymer resin shows that light can be used to attain spatiotemporal control over morphogenic patterning in frontal ring-opening metathesis polymerization. Polymerization is initiated at the center of the image using a powerful LED which creates one large defined wave that moves outward at smaller and smaller frequencies due to an oscillating thermocline (viewable as circular ripples).

ILLINOIS LAS

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