

UMass**Amherst**

Polymer Science  
and Engineering



# ALUMNI NEWSLETTER

Fall | 2021

## In This Issue

PSE Alumni and Industrial Fellowship Awardees ..... 3

Faculty & Student Awards ..... 4

PSE Graduates ..... 4

ASCENDS 2021 ..... 5

Retirement ..... 5  
Lou Raboin

Research Highlights ..... 6-8

Polymer Upcycling Using Supercritical CO<sub>2</sub>

Engineering Two-dimensional Materials with Polymer Zwitterists

Switchable Positioning of Plate-like Inclusions in Lipid Membranes

Autonomous Snapping and Jumping Polymer Gels

Self-regulating Soft Materials

SpaceX Dragon CRS-22 Brings PSE Research to Outer Space

Mentoring @PSE and Beyond ..... 9  
ACS PMSE/POLY 2021

In Memoriam ..... 10  
Richard Stein

Gifts ..... 11

### PSE Newsletter Team

David Hoagland (Editor)  
E. Bryan Coughlin (Lead Writer)  
Jessica Skrocki (Media & Coord.)  
Moiria Clingman (Design & Layout)

### Special thanks to

Laura Bradley  
Todd Emrick  
S. Pirl Ertem  
Aditi Naik

Update contact info at <https://www.pse.umass.edu/alumni-form>.

Please send comments to [jskrocki@polysci.umass.edu](mailto:jskrocki@polysci.umass.edu)

### Front cover

Apple Picking with PMSE/POLY at Cold Springs Orchard in Belchertown. See page 9.

## Remarks from our Chair

*Dear PSE Alumni and Friends of the Department,*



With the COVID-19 pandemic lingering, but with reliable safeguards in-place, research and teaching in PSE are progressing at almost full speed. Most of the record number of students who graduated over the past 18 months found excellent permanent jobs or prestigious post-doctoral positions. PSE's scientific discoveries are continuing to gather significant notice through publications in top-tier journals as well as numerous issued patents. Except for a few weeks at the pandemic's outset, PSE's research has been diminished little, although the curriculum was taught virtually for three semesters.

First-year students had difficult and lonely experiences, with little opportunity to connect with the other students or the faculty, but all are now thriving. At the virtual PSE55 celebration in June, current students and faculty members energetically re-connected with alumni through Zoom and Gather.town, and it became clear that the PSE alumni are more eager than ever to reach out to each other and the department; this fall's PSE Yearbook was a treat for all, with comments and reminiscences offered by more than 100 alumni.

We are now enjoying face-to-face interactions with students in class, seminars, and laboratories, and alumni and distinguished visitors are routinely coming to campus. As travel resumes, everyone looks forward to interactions with more companies/institutions and attendance again at professional society meetings. In PSE, we also look forward to the hire of the department's third chaired professorship (the Robert Barrett Chair) and the chance to work with a large, talented, and diverse class of incoming students. A sad note was sounded in June with the passing of Prof. Richard Stein, who founded and sustained UMass polymer activities for nearly 70 years.

Going forward, PSE is perfectly positioned to address many of society's great challenges, from the storage of energy to the elimination of plastic waste. I'm sure that many of our alumni are similarly engaged, and we are proud of their accomplishments, of which we hear news nearly daily.

The Department remains dedicated to the financial support of first-year graduate students. This was always, and still is, an overriding priority. A first graduate year of intense but unfettered polymer education is crucial to thesis success and the careers of our graduates beyond their time in PSE. However, obtaining the funds needed to maintain this important tradition is becoming increasingly difficult. We ask our alumni, who themselves benefited from this ambitious year of foundational polymer education, to think of PSE in their philanthropic giving. We are proud and grateful to point out that support from PSE alumni has grown tremendously in the past few years, to the point that an unprecedented number of first-year students are now at least partly supported by alumni fellowships (see page 3). Over time we hope that corporate and alumni gifts, along with endowment income, will grow so much that it can provide full financial support to the entire PSE first-year class. This goal remains distant, and we ask you for continued support while this vital effort is advanced. Together we can ensure opportunities for future generations of PSE graduate students that are equal, or even better, than those experienced by past generations.

*David Hoagland*





# PSE Alumni and Industrial Fellowship Awardees



**Serena Birnbaum**  
**William J. MacKnight Fellowship**  
2021-2022

BS Polymer Engineering,  
Case Western Reserve University

---



**Zichen (Sherri) Jin**  
**William J. MacKnight Fellowship**  
2020-2022

BS Chemistry, University of  
Minnesota Twin Cities

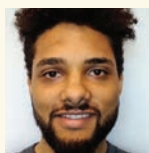
---



**Nolan Miller**  
**David Lipp Fellowship in  
Polymer Science &  
Engineering**  
2020-2021

BS Materials Science & Engineering,  
Purdue University West Lafayette

---



**Marcel Brown**  
**PPG Foundation Fellowship**  
2020-2021

BS Chemistry, Johannes Gutenberg-  
Universität Mainz

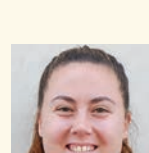
---



**Gyounglyul Jo**  
**Polymer Science &  
Engineering Endowment  
Fellowship**  
2021-2022

BS Polymer Engineering, Chonnam  
National University

---



**Autumn Mineo**  
**PPG Foundation Fellowship**  
2021-2022

BA Chemistry, Smith College

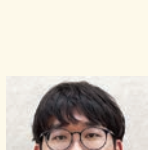
---



**Christopher Cueto**  
**Arkema Fellowship**  
2020-2021

BS Chemistry, Juanita College

---



**Myounguk Kim**  
**Kleiner Family Fellowship**  
2020-2021

BS Chemistry, Yonsei University

---



**Katelynn O'Donnell**  
**Kleiner Family Fellowship**  
2021-2022

BS Chemistry, Villanova University

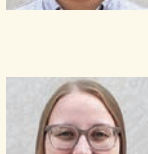
---



**Yuhui (Helen) Du**  
**PSE 50 Alumni Fellowship**  
2020-2021

BA Chemistry, Smith College

---



**Kayla Koch**  
**Polymer Science &  
Engineering Endowment  
Fellowship**  
2020-2021

BS Biochemistry, Western  
Washington University

---



**Claire Senger**  
**Kleiner Family Fellowship**  
2020-2021

BS Materials Science, University of  
Minnesota Twin Cities

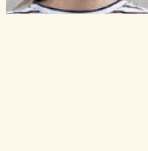
---



**Ria Ghosh**  
**PPG Foundation Fellowship**  
2020-2021

BS Chemistry,  
University of Calcutta

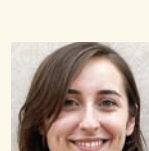
---



**Yeseul Lee**  
**Professor Richard J. Farris  
Scholarship**  
2021-2022

BS Chemical Engineering,  
Ewha Woman's University

---



**Morgan Smith**  
**David Lipp Fellowship in  
Polymer Science and Engi-  
neering, Lenz Scholarship  
Fund**  
2020-2021

BS Engineering, Saint Vincent  
College

---



**Ching Hsien (Justin) Ho**  
**PSE 50 Alumni Fellowship**  
2020-2021

BA Chemistry, Williams College

---



**Grace Leone**  
**David Lipp Fellowship in  
Polymer Science &  
Engineering**  
2021-2022

BS Chemistry, University of Pittsburgh

---



**Carla Steppan**  
**David Lipp Endowment in  
Polymer Science & Engi-  
neering**  
2021-2022

BS Chemistry; Art, Washington  
University

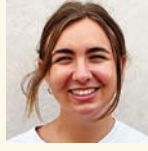
---



**Xin Hu**  
**PSE 55 Alumni Fellowship**  
2021-2022

BS Chemistry, Nankai University

---



**Cheng-Han Li**  
**Kleiner Family Fellowship**  
2021-2022

BS Chemical Engineering,  
National Tsing Hua University

---



**Ying Zhao**  
**PPG Foundation Fellowship**  
2021-2022

BS Materials & Engineering,  
Sun Yat-sen University

---



**Tera Huang**  
**PSE 50 Alumni Fellowship**  
2021-2022

BS Chemical Engineering, National  
Cheng Kung University

# Faculty & Student Fellowships & Awards

## Faculty Awards

**Greg Grason** Elected Fellow of the American Physical Society 2020

**Reika Katsumata** National Science Foundation: Faculty Early Career Development Program (NSF CAREER) 2021

**Laura Bradley** Army Research Office YIP Award, 2020; USC Viterbi Mork Family Department Early Career Achievement Award, 2021

## Student Awards (continued from page 3)

**Juan Correa Ruiz** Graduate School Fellowship, 2021-2022

**Hazel Davis** Spaulding-Smith Fellowship, 2021-2022

**Yuhui (Helen) Du** Graduate School Fellowship, 2020-2021

**Benjamin Greenvall** Graduate School Fellowship, 2021-2022

**Ching Hsien (Justin) Ho** GAANN Fellowship, 2020-2021

**Zichen (Sherri) Jin** Graduate School Fellowship, 2020-2022

**Mary Kathleen Jutze** Graduate School Fellowship, 2021-2022

**Myounguk Kim** Graduate School Fellowship, 2020-2021

**Kayla Koch** GAANN Fellowship, 2020-2021

**Minjung Lee** PPG Polymer Event Poster Award, 2021

**Shiqi Liu** Graduate School Fellowship, 2021-2022

**Alex McGlasson** PPG Polymer Event Poster Award, 2021

**Nolan Miller** GAANN Fellowship, 2020-2021

**Demi Moed** Spaulding-Smith Fellowship, 2021-2022

**Varun Pande** Graduate School Fellowship, 2021-2022

**Claire Senger** GAANN Fellowship, 2020-2021

**Morgan Smith** NIH Biotechnology Training Program (BTP) Fellowship, 2020-2021

**Takumi Uchiyama** Santos Go Award, 2020-2021

**Lucas Verrastro** Graduate School Fellowship, 2021-2022

**Tomoko Yamazaki** Graduate School Fellowship, 2021-2022

## PSE Graduates



**Abhiram Reddy** (G. Grason) September 30, 2021  
*Modeling Chain Packing in Complex Morphologies of Block Copolymers*

**Elizabeth Stubbs** (T. Emrick; A. Lesser) September 2, 2021  
*Designing Nonflammable Polymers and Blends Containing Deoxybenzoin Derivatives*

**Dylan Barber** (A. Crosby; T. Emrick) September 1, 2021  
*Synthesis, Fabrication, and Assembly of Mesoscale Polymer Filaments*

**Sarah Ward** (T. Emrick) August 17, 2021  
*Developing Injectable and Implantable Polymer Zwitterion Platforms for Glioblastoma Treatment*

**Yifeng Du** (E. B. Coughlin) July 24, 2021  
*Radical Polymerizations: Features, Applications, Developments, and Perspectives*

**Daniel Camarda** (A. Lesser) June 28, 2021  
*Advanced Materials Design using Application-Based Processing Techniques*

**Sadhana Chalise** (M. Muthukumar) May 6, 2021  
*Modeling the Structures and Dynamics of Polyelectrolytes*

**Ashlin Sathyan** (T. Emrick) April 14, 2021  
*New Approaches to Functional Material Chemistry and Interfaces*

**Huyen Vu** (E. B. Coughlin) April 5, 2021  
*Designing Stimuli-Responsive Nanocomposites to Investigate Interface Dynamics*

**Xiyu Hu** (J. Watkins) April 2, 2021  
*Direct Printing/Coating/Plating of Key Components for Electronic Devices*

**Christopher Hango** (G. Tew) March 29, 2021  
*Enhancing the Intracellular Availability of Protein Cargoes in Polymer-Mediated Delivery*

**Chinmay Saraf** (A. Lesser) March 19, 2021  
*Engineering Advanced Material Properties for Polymeric Materials through Miscible and Immiscible Additives*

**Allen Chang** (K. Carter) December 12, 2020  
*Surface Modification of Cellulose Nanocrystals: Imparting Non-native Properties on Sustainable Substrates*

## ASCENDS 2021 Bolsters Undergraduate Summer Research in PSE



ASCENDS students, Geneva McElvaine (Rhodes College), Jordan Varma (University of Mississippi), Infania Pimantel (University of New Mexico) and Miracle Emenuga (University of Kansas)

The 2021 inaugural cohort of Advancing Science & Engineering with Diverse Scholars (ASCENDS) embarked on an exciting ten-week research program during the first week of June, concluding with a symposium during the first week of August. Despite the day-to-day uncertainties of research activities due to Covid, the program successfully recruited four undergraduate students to PSE for in-person research with faculty and graduate student mentors. With stipend support from DuPont, PPG, Saint-Gobain, and Solvay, combined with matching contributions from the Center for UMass-Industry Research on Polymers (CUMIRP) and faculty mentors, the students conducted projects in polymeric and soft materials science and engineering as PSE emerged from Covid restrictions.

Augmenting their research activities were weekly lunches and programmatic presentations at which ASCENDS students, together with the breadth of summer undergraduate researchers and mentors at UMass, met for presentations from industrial and academic guests on topics ranging from technical research updates, career perspectives, and outreach to K-12 students. A tremendous group of ASCENDS students comprised this inaugural class, with mentorship from Professors **David Waldman** (CUMIRP Director) along with **Reika Katsumata**, **Greg Grason**, **Al Crosby**, **Laura Bradley**, and **Todd Emrick** and several members of their research groups. We look forward to next summer with ASCENDS 2022!

## Retirement

After 45 years of dedicated service to the PSE Department and the University, **Louis (Lou) Raboin** retired in August 2021. Lou first came to UMass in 1973 as an undergraduate studying Zoology. Graduating in 1976, he worked in the Food Science and Nutrition Department for two years before joining Edwin (Ned) Thomas' group in the PSE Department as a Technical Specialist in charge of the University's first electron microscopy equipment. Later, after Thomas' departure in 1988, he was appointed to oversee the same equipment as a shared instrument facility of the PSE Department and the Materials Research Laboratory. Much later, in 2017, he moved alongside PSE's now well-established Electron Microscopy Facility, to the Institute for Applied Life Science (IALS), where the facility was designated a Campus Core Facility.

Over these many twists and turns, Lou always remained a valued member of the PSE community, supporting and encouraging everyone in his own low-key manner. Lou taught multiple generations of PSE students about TEM, SEM, and optical microscopy, most notably through his valued contributions to PSE core characterization lab course, PSE 603. In PSE and across campus, Lou was especially recognized for his extraordinary hands-on expertise in ultra-microtomy of soft polymer samples. As a measure of his impact, Lou was acknowledged for his electron microscopy assistance in over 125 Master's Theses and Doctoral Dissertations written from PSE, Chemistry and Chemical Engineering. Outside of work, Lou was an accomplished mountaineer and winter wilderness traveler; most recently, he has become a dedicated distance runner, sometimes finishing multiple major marathons each year.

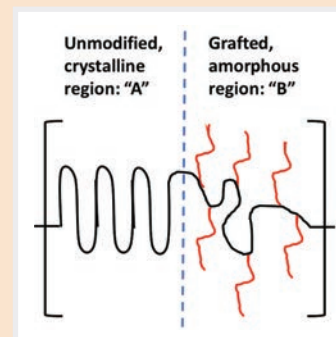




# Research Highlights

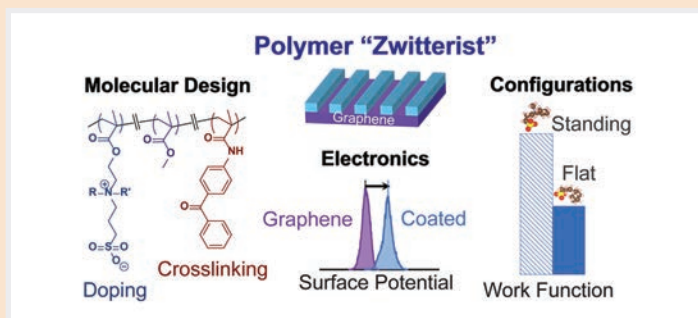
## Polymer Upcycling Using Supercritical CO<sub>2</sub>

To achieve polymer upcycling, PSE researchers led by [Alan Lesser](#) fabricated graft copolymers from semi-crystalline thermoplastics. The copolymers were synthesized in supercritical CO<sub>2</sub> by free radical polymerization of a vinyl monomer such that grafting occurred exclusively in the polymer's amorphous regions. Polystyrene-polyamide 6 copolymers showed the highest graft yield as well as improved properties such as elevated glass transition temperatures, remelting ability, controllable hydrophobicity, and tunable molecular weight of grafts. The results were published in *The Journal of Applied Polymer Science*.



## Engineering Two-dimensional Materials with Polymer Zwitterists

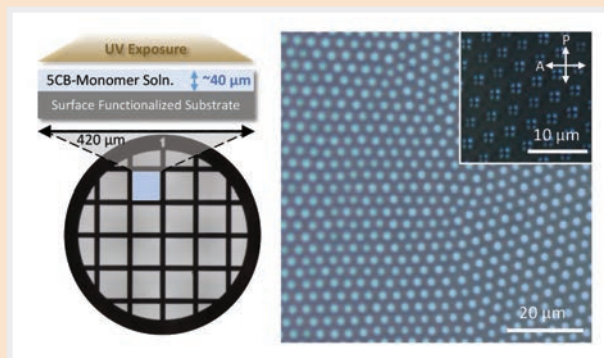
The research groups of [Reika Katsumata](#) and [Todd Emrick](#) collaborate on the development of 2D electronic materials by optimizing performance through the application of functional polymer coatings. Their recent publication in *ACS Nano* describes the impact of novel zwitterion chemistry on work function modulation of monolayer graphene, a series of sulfobetaine-based random copolymer ultrathin films of increasing steric footprint were placed in contact with the 2D material.



Covalent attachment of a photo-crosslinker into the polymer structure enabled the first successful lithographic patterning of solution-processable negative-tone “zwitterists” for non-covalent electronic modification of graphene. This zwitterionic polymer design holds promise for advancing the role of polymers in fine-tuning electronic properties of 2D materials.

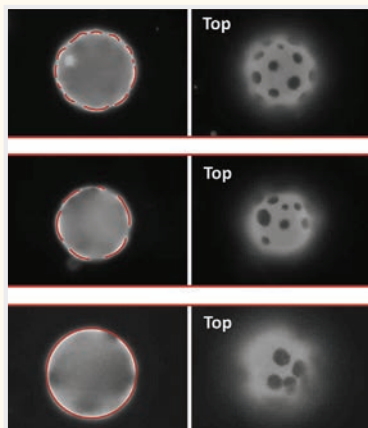
## Simultaneous Synthesis and Assembly of Colloidal Crystals

[Laura Bradley's](#) group introduced a new method for simultaneously synthesizing and assembling polymer colloids into colloidal crystals using nematic liquid crystals. The process, published in *Soft Matter* forms polymer colloids by polymerization-induced phase separation of monomer dissolved in a thin layer of a nematic liquid crystal. The elastic energy of the nematic phase induces the spontaneous organization of the colloids during their growth at the liquid surface. This one-step process presents new opportunities to leverage LC-templated growth and assembly to produce diverse and functional colloidal superstructures.



# Research Highlights

## Switchable Positioning of Plate-like Inclusions in Lipid Membranes



**Maria Santore** and **Greg Grason** led a team of researchers that demonstrated for the first time that the positions of flat, solid objects integrated in nanometrically thin membranes — resembling those of biological cells — can be controlled by mechanically varying the elastic forces in the membrane itself. This milestone is a significant step toward creating ultrathin flexible materials that self-organize and respond to mechanical force.

The team discovered that rigid solid plates in biomimetic fluid membranes experience interactions that are qualitatively different from those of biological components in cell membranes. In cell membranes, fluid domains of adherent viruses experience either attraction or repulsion, but not both. To precisely position solid objects in a membrane, both attractive and repulsive forces must be available. The team used giant unilamellar vesicles, or GUVs, which are cell-like membrane sacks, to probe the interactions between solid objects in a thin, sheet-like material.

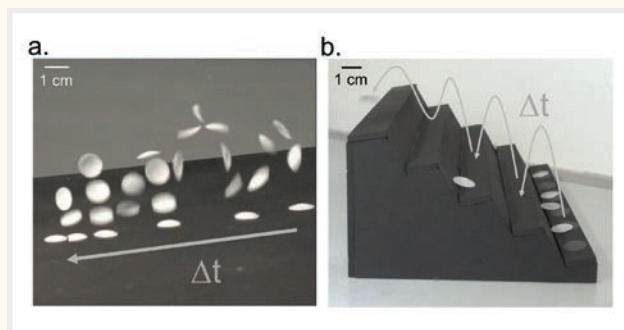
The GUVs were modified so that the membranes included tiny plate-like masses. The collaboration between the Santore lab and the Grason theory group is the first to show that by modifying the curvature and tension of the membrane, the plate-like masses can attract and repel each other. This ability to direct the positioning of plates in a membrane is a giant step toward engineering a 2D material that is responsive to stimuli and can self-organize in controllable and reconfigurable ways.

<https://advances.sciencemag.org/content/7/14/eabf1943>

<https://www.umass.edu/news/article/umass-amherst-team-discovers-how-use>

## Autonomous Snapping and Jumping Polymer Gels

Imagine a rubber band capable of snapping itself many times over or a small robot able to jump up a set of stairs propelled by nothing more than its own energy. Researchers in the **Crosby** group have discovered how to make materials that snap and reset themselves, relying only on energy flow from their environment. The discovery may prove useful for various industries that want to source movement sustainably, from toys to robotics, and is expected to further inform our understanding of how the natural world fuels various types of movement.



The team uncovered the physics during a mundane experiment that involved watching a gel strip dry. The researchers observed that when the long, elastic gel strip lost internal liquid due to evaporation, the strip moved. Most movements were slow, but every so often, they sped up. These faster movements were snap instabilities that continued as the liquid evaporated further. Additional studies revealed that the shape of the material mattered and that the strips could reset themselves to continue their movements. These latest results from the Crosby group are part of a larger multidisciplinary university research initiative funded by the Army Research Office that aims to uncover many similar mechanisms from fast moving biological organisms and translate them into new engineered devices.

<https://www.pse.umass.edu/news/crosby-group-publishes-nature-materials>

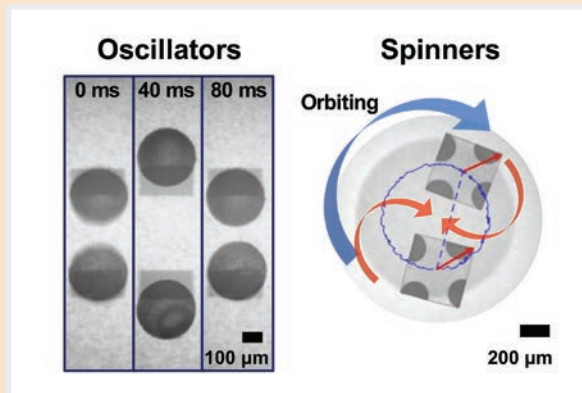
<https://www.umass.edu/news/article/umass-amherst-researchers-discover>

<https://www.nature.com/articles/>

# Research Highlights

## Self-regulating Soft Materials

Lampreys swimming, horses walking, and insects flying: each behavior is made possible by a network of oscillators — mechanisms that produce a repetitive motion, such as wriggling a tail, taking a stride, or flapping a wing. What’s more, these natural oscillators respond to their environment in predictable ways. The **Emrick** and **Hayward** groups collaborated to solve key questions about the motions. One was in getting a series of oscillators to work in unison, a prerequisite for coordinated, predictable movement. “We have developed a new platform where we can control with remarkable precision the coupling of oscillators,” says Hayward. That platform relies on yet another natural force, known as the Marangoni effect, which is a phenomenon that describes movement along the interface between two fluids driven by changes in surface tension. “It all comes down to understanding the role of interfaces and the profound impact of combining polymeric and metallic materials into composite structures,” says Emrick. The team used hydrogel nanocomposite disks made up of polymer gels and nanoparticles of gold, which were sensitive to changes in light and temperature. The team was able to engineer a diverse array of oscillators that can move in unison with each other and respond predictably to changes in light and temperature. “We can now engineer complex coupled behavior that responds to external stimuli,” says **Hyunki Kim**, the paper’s co-lead author.



<https://www.pse.umass.edu/news/hyunki-kim-hayward-and-emrick-groups-publish-pnas>  
<https://www.umass.edu/news/article/nature-provides-inspiration-breakthrough>  
<https://www.pnas.org/content/118/18/e2024581118>

## SpaceX Dragon CRS-22 Brings PSE Research to Outer Space



**Tom Russell** and his former UMass student and current postdoc **Paul Kim** are helping to take polymer research to the next level: outer space. SpaceX Dragon CRS-22 carried the experiments in its payload to the International Space Station (ISS). Even more impressively, it’s a trio of high school students who are driving the polymer experiment. **William Tang, Jennifer Song, and Julia Kim** are three students at Valley Christian High School in San Jose, CA, and they’re part of a team conducting experiments on the ISS. As Kim tells the story, the three students reached out to him and Russell about which experiments would be both feasible and make useful contributions to polymer science. Russell and Kim suggested that the students investigate how micro-gravity influences liquid-fluid interfaces, more specifically, substances in which a droplet of oil is injected into a droplet of water.

If a polymer-functionalized nanoparticle is added, it migrates to the interface between the liquids and allows the liquids to be shaped and controlled at will. Russell and Kim coached the students in the basics of polymer science. “They were able to follow along beautifully,” says Kim. “I was very impressed. I didn’t give them a detailed experimental setup, and instead, they successfully designed and built the infrastructure themselves. They fully understood what they were doing.”

<https://www.pse.umass.edu/news/spacex-dragon-crs-22-brings-research-outer-space> <https://www.umass.edu/news/article/collaboration-between-umass-researcher-and-high-school-students-launches-polymer>



## Mentoring @PSE and Beyond

---

The peer-to-peer mentoring programs in PSE assist students throughout their time in graduate school. The programs (a) guide incoming students through their transition into the rigorous graduate program and the major milestones of the first year and (b) provide academic, professional, and personal development opportunities for students at all levels of study. The programs strive to create a supportive, inclusive, and structured environment for graduate students to access UMass and PSE resources and to network with fellow students and faculty members.

The original PSE Mentoring Program assisted first-year students with the advisor selection process by asking older students to share their experiences. The programming was then expanded to include advice and resources relating to cumulative exams, emotional intelligence, grants, and other aspects of graduate student life. Due to the social nature of mentoring meetings, the program has served as a bridge between the social and academic gaps in graduate school for first-year students during their transition into the PSE community.

In 2019 the PSE Mentoring Program, recognizing a new need, reorganized itself to form a First Year Mentoring Committee and a Senior Student Mentoring Committee. Much like the First Year Mentoring Committee, the Senior Student Committee aims to provide opportunities for professional, academic, and personal development for more senior graduate students. This committee develops events that address the academic milestones of the prospectus, original research proposal, data and thesis defenses. This group also leads workshops on

topics such as career paths, interview skills, work-life balance, and expectation of management. PSE research groups host more than a dozen post-doctoral research associates each year, and peer-to-peer mentoring is now firmly in place to assist this group of scholars in connecting with each other and the department, and also assist them with planning their next career move.

Recent PSE alumni are initiating a post-graduate mentoring network starting Fall 2021. This group aims to establish a PSE alumni mentoring community in which senior graduate students can easily connect with early-career alumni and early-career alumni can connect with mid- to late-career peers. An inclusive and global network of alumni which provides an honest perspective of “life beyond PSE” to graduating students and advice on selecting a career path is imagined.

To kick-off the new program, a successful breakout session was held during PSE 55 to engage with alumni, workshop ideas, and gather feedback and suggestions. There are currently thirty PSE alumni from various backgrounds and experience levels who have volunteered as mentors. Work has begun connecting mentors to current PhD students. Next steps are to develop virtual and in-person events to help foster student-to-alumni and alumni-to-alumni connections.

---

Please reach out to [Aditi Naik \(aditi.naik42@gmail.com\)](mailto:aditi.naik42@gmail.com) or [Piril Ertem \(pirilertertem@gmail.com\)](mailto:pirilertertem@gmail.com) if you are interested in serving as an alumni mentor or would like to be a part of the executive planning committee.

## UMass Amherst ACS PMSE/POLY 2021 “Outstanding” New Student Chapter!



*The PMSE/POLY Student Leadership team: James Pagaduan, Hazel Davis, Anne Radzanowski, and Roshni John Chethalen*

Our new student chapter provides opportunities for student growth scientifically and professionally through activities including professional development events, seminar series, and company tours/talks. We work in conjunction with existing groups within the UMass PSE department, including PSE Club, First Year Mentoring, and the Outreach groups. More broadly, our chapter collaborates with other ACS PMSE/POLY student chapters to bring additional events to the UMass Amherst community. Our apple picking event at Cold Springs Orchard in Belchertown this fall is featured on the front cover of this magazine.

# In Memoriam



*Professor Richard Stein, Director of the Polymer Research Institute, examines the data of (then) student, Mr. Tisato Kajiyama ('69) in 1967. Stein and Kajiyama reunited at the PSE 50 Alumni Reunion in 2016.*

Professor **Richard (Dick) Stein**, founder of polymer research at UMass, passed away peacefully at his home surrounded by family members on June 21, 2021. He was 95 years old. Stein's early foresight and energy were key to the establishment and the rise to prominence of the Polymer Science and Engineering Department. He played central roles in the department for over 50 years.

A native of Long Island, N.Y., Stein studied chemistry at Brooklyn Polytechnic Institute, where he made some of the first light-scattering studies of polymer dimensions in solution. After graduating in 1945, he continued his polymer studies at Princeton, earning his doctorate in 1948. After a brief period away, he returned to Princeton in 1949 to continue work on polymers. In the post-war period, plastics were the "next big things" and funding for the sciences at universities increased. Stein was poised to rise to prominence in his field. He came to UMass Amherst in 1950 as an associate professor of chemistry and launched the polymer program.

Known as a trailblazing researcher, Stein made deep, lasting collaborations across disciplines. Perhaps the most notable was the founding of the Polymer Science Research Institute and the Research Computing Center at UMass Amherst in 1961. He also was the driving force behind the establishment of the Silvio O. Conte National Center for Polymer Research at UMass. Considered a founding father of polymer science research, Stein was respected both nationally and abroad as one of his generation's most prominent scientists in polymer science.

Throughout his career and into his active retirement, Stein received numerous awards and accolades, including being a member of the first delegation in chemistry to the People's Republic of China. He was inducted into the National Academy of Sciences in 1991, the National Academy of Engineering in 1992, the American Academy of Arts & Sciences in 1992, and the Plastics Hall of Fame in 1996. Stein also was recognized for his commitment to students in the classrooms, and research laboratories. In 1999, the Materials Research Society conferred on him its highest honor, the Von Hippel Award. Stein was the first polymer scientist to receive the award. The society recognized Stein for his 50 years of research on how polymer materials orient, crystallize and deform and saluted him for originating the field of rheo-optics, which encompasses simultaneous real-time measurement of optical properties and polymer melt rheology.

Nearly all the department's alumni who interacted with Stein have fond remembrances of his teaching, mentoring, and infectious enthusiasm. Stein had similar impacts on the world polymer stage, winning most of the field's awards and heavily influencing polymer research in Japan, Europe, and elsewhere. We all will dearly miss him.

---

Donations in his honor can be made online for the Richard Stein Endowed Fund for Polymer Science  
<https://minutefund.umass.edu/project/26670/donate>

---



# Gifts

## Alumni

Anil Torgalkar '68  
Regina Gallagher Torgalkar  
Lawrence W. McKenna Jr. '70  
Do Yeung Yoon '73  
Beata J. Abbs '74  
Richard E. Lyon '75  
Virginia O'Brien Lyon  
Roy P. McKnight '75  
Ashvinku M. Patel '75  
James J. Tkacik '76  
Joel R. Fried '76  
Su-Don Hong '76  
Matthew V. Tirrell '77  
Robert J. Cembrola '78  
David A. Tirrell '78  
Jane G. Tirrell '79  
Jehuda Greener '78  
Helena Temkin-Greener '79  
Lothar W. Kleiner '78  
Steven E. Keinath '78  
Larry S. Corley '79  
Stephanie R. Corley  
Thomas P. Russell '79  
Allen R. Padwa '79  
Richard W. Campbell '80  
Jeannine Campbell  
David P. Anderson '81  
David A. Waldman '82  
Carolyn Schwartz  
Varkki P. Chacko '82  
Madhura V. Chacko '80  
Paul V. Grosso '83  
Ronald J. Tabar '83

Tzoo-Heng B. Fu '85  
Doreen S. Rao '86  
Carmen A. Covelli '87  
Stewart Herman '87  
Eric J. Beckman '88  
Joanne H. Beckman '84  
Makarand H. Chipalkatti '89  
Renu Chipalkatti '87  
John M. Connolly '90  
Scott D. Thomas '92  
Cristina U. Thomas '92  
Christian Lietzau '93  
Charmaine Wijeyesinghe  
Ajay D. Parkhe '94  
Eric W. Kendall '94  
Karen M. Kendall  
Mario A. Perez '94  
Jaya N. Perez '95  
Robert J. Fleming '95  
Naveen Agarwal '98  
Elif Gurel  
Andrew A. Bushelman '99  
Weiguo Hu '99  
Angelo Pedicini '00  
Adam S. Zerda '02  
Michael J. Leonard '05  
Gail C. Leonard '01  
Kaoru Aou '07  
Sonal S. Khilari '07  
Qingling Zhang '08  
Jinbo He '09  
Peiwen Zheng '12  
Xinyu Wei '12  
Yongping Zha '12  
Jun Cui '13

Elizabeth S. Sterner '14  
Wenxu Zhang '16  
Dong Li '15  
S. Piril Ertem '16  
Qingyou Meng '18

## Friends

Harry A. Avonti  
Shirley J. Avonti  
Darcy Dumont  
Lynn Grabon  
Robert S. Coffey  
Benjamin S. Hsiao  
Simon W. Kantor  
Thein Kyu  
Philip A. Lemere  
Debra A. Lemere  
Douglas H. Lenz '86  
Ellen H. Parsons  
Janet Powers  
Elizabeth Rowell  
Mitsuhiro Shibayama  
Yohji Shindo '68  
Susan L. Tapases  
Christos A. Tapases  
Regina Gallagher Torgalkar  
Grace W. Yang  
Wallace W. Yau '66  
Arkema Inc.  
Lipp Family Foundation  
PPG Industries, Inc.  
  
Anonymous Donor

---

Give to PSE <https://www.pse.umass.edu/alumni/phd-alumni-list/giving-pse>

---

Stay in Touch! Follow us on Twitter @UMassPSE





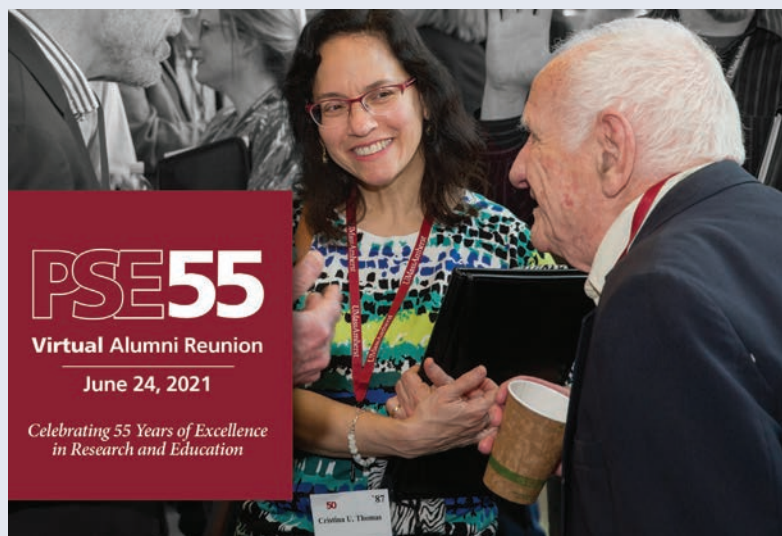
Polymer Science and Engineering  
Silvio O. Conte National Center for Polymer Research  
120 Governors Drive  
Amherst, Massachusetts 01003-9263

NON PROFIT ORG  
U.S. POSTAGE  
PAID  
AMHERST MA  
PERMIT NO. 2

## Lively virtual discussions highlighted PSE 55 Alumni Reunion, held in June to commemorate PSE's fifty-fifth year.

The event featured a panel discussion "The Past, Present and Future of PSE Outreach and ASPIRE Programs" that reflected on the 25-year history of student-led outreach programs. The panel was led by current students Heather Hamilton and Cindy Bukowski and featured PSE alums Nakul Bende '11, Jennifer David '93, Andrew Davis '09 and Elizabeth Sterner '07, who relayed their experiences in PSE outreach programs and the impact that participation had on their careers after PSE.

PSE55 also featured a round table discussion, "Your Career in Industry and the Importance of Collaboration and Partnerships with Government Institutions and/or Universities", guided by Cristina Thomas '87. As part of the discussion, Robert Fleming '90 hosted "Charting a successful career path in start-up companies", while Aditi Naik '13, Piri Ertem '11 and Dylan Barber '15 co-hosted "Post-Graduation Mentoring, how to best take advantage of the PSE Network."



**Stayed tuned for an in-person celebration of PSE 60 in 2026!**