

# PSE Newsletter, Fall 2015

The Fall 2015 - Spring 2016 academic year marks the 50th year of the Polymer Science and Engineering graduate program at UMass. This past year, we've been having a blast with a number of activities and events that celebrate this major milestone.

In September 2014, we kicked off the 3-year PSE50 fund raising campaign. Since that time the campaign has raised over \$170k from alumni and faculty, setting new records for giving to the department. Most important, these gifts represent crucial support for the next generation of alums, PSE students in their first year. For those yet to give this year, we still need your support to reach our \$100k goal for the year.

This past August, many of you joined us at the PSE50 Symposium at the ACS meeting in Boston. The 2-day scientific symposium featured 24-invited talks from alums and affiliates of PSE that highlighted key advances at the frontiers of polymer research as well as the long-term impact of the department on the polymer field. The event was capped off by a dinner event on the Boston Fishing Pier (photos on page 7). This event was followed only a few days later back in Amherst, by the symposium, jointly sponsored by Chemistry and PSE, to honor the career and 90th birthday of Dick Stein.

We continued to celebrate the anniversary this fall, first and foremost, by welcoming the 50th entering PSE class to campus (pictured below). Finally, we kicked off the PSE50 Alumni Seminar Series this September which runs through the Spring 2016 semester (schedule on page 7).

While we've had a lot of fun so far, the main event in is yet to come! The celebration of the 50th anniversary of the department culminates this spring during the **PSE50 Reunion**. The event will be held on **May 12-13** (immediately to follow the 2-day spring CUMIRP meeting) on the UMass Amherst campus. The 2-day event will include a half-day alumni symposium, a celebratory dinner event, a chance to meet and discuss science with current PSE students, and reunions of current and former lab groups in PSE. All alumni, current and former friends, faculty and affiliates of UMass PSE are invited. Please RSVP today by visiting the reunion homepage [www.pse.umass.edu/reunion/](http://www.pse.umass.edu/reunion/) where you will find a preliminary event schedule, list of confirmed speakers, as well as information regarding hotel reservations. We hope to see *all of you* back this spring (this means *you!*). Start contacting fellow PSE class- and labmates to let them know you'll be in Amherst this May!

*PSE Newsletter Editor*

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## 50th entering PSE first-year class:

(back row, left to right) John Epling, Chris Barney, Allen Chang, Christian Steinmetz, Dylan Barber, Abhiram Reddy, Christopher Hango, Doug Hall, Duk Man Yu, Christian Berac; (front row, left to right) Ashlin Sathyan, Carolyn Zhao, Reed Bay, Yagmur Buelbuel, Ioanna Xenidou, Wuqi Niu, Gayathri Kopanati, Sadhana Chalise, Sarah Ward, Alexa Kuentler

## PSE History, Part II

To mark the 50th anniversary of the PSE program, we take the opportunity reflect on the evolution of polymer research and education at UMass. **Prof. Bill MacKnight**, who was there from the inception of the program, authored the first part in this series featured in the Fall 2014 issue, describing the origins and early history of PSE. In this second installment, he covers the growth of the program through the 1980s as well as the planning for and move to the Conte Research Center.

The first installment of the PSE retrospective covered the development of polymer research and education at UMass, beginning from the founding of the Polymer Research Institute (PRI) in the 1950's, through the start of the PSE graduate program in 1966, up to the establishment of the Center for UMass Industry Research in Polymers (CUMIRP) in the early 1980's. In the next period of the department's history, PSE continued to grow in stature, numbers and footprint on campus.

Significant to the growing reputation of the department was the IUPAC Macromolecular Congress, hosted by the department in 1982. This event served as an introduction to UMass and PSE for leading polymer scientists from around the globe. To mark the occasion UMass awarded honorary doctorates to two legendary polymer scientists, Paul Flory and Herman Mark. The same year saw the hiring of two new faculty members, Tom McCarthy and Murugappan Muthukumar. McCarthy, who had just completed a Ph.D. at MIT with George Whitesides, joined following the departure of Otto Vogl. Muthukumar, who joined UMass from the faculty at Illinois Institute of Technology, was a polymer theoretician, a research area not represented in PSE since the departure of Isaac Sanchez in 1977.

By 1982, there were four important administrative entities on campus concerned with polymers: the PSE department, The Materials Research Laboratory (MRL), CUMIRP, and the PRI. These were soon joined by another research center, the Advanced Polymer Materials (APM). This center, established with Frank Karasz as director, was funded by the Air Force Office of Scientific Research (AFOSR) and Celanese Corporation.

To support the growth of faculty size and expanding research mission, adequate space now become a critical need for the department. At that time, PSE labs were housed on the 7th and 8th floors of the Graduate Research Center (GRC) along with a few locations in the Goessmann Lab. Beyond these permanent locations, a small temporary building (Goessmann Annex) was erected to house the APM operation, while trailers were brought in to provide additional student office space.

In 1983, a study group was created to explore the avenues to obtain funding for a new building capable of housing PSE research efforts and associated Centers. The study group was composed of PSE faculty, along with a number of distinguished academics, including then MIT professor, John Deutch. The need for new facilities for academic research was a nationwide problem in the early 1980's. Legislative "earmarking", which attached local project funding to congressional acts, was only beginning to become the commonly-known political channel that it is today. While there was considerable internal debate among the PSE faculty about this strategy, at the urging of the then chancellor, Joseph Duffy, it was decided to pursue this approach to seek funds for the new building. Congressman Silvio O. Conte was persuaded to exert his considerable political influence, and he was able to obtain \$20 million for

the building in 1985, which assured that the building would ultimately be realized, although a number of hurdles remained at that point.

With building plans emerging in 1985, Bill MacKnight stepped down as PSE Department Head and was succeeded by Ned Thomas. The same year, two new faculty members were also appointed, Dave Hoagland and Dave



**Groundbreaking ceremony for the new building** - (left to right) Tom McCarthy, Dick Farris, Corinne Conte, Dick Stein, Bill MacKnight, M. Muthukumar, Scott Bartlett, Dave Tirrell, Dave Hoagland, Shaw Ling Hsu and Henning Winter (photo courtesy of UMass archives).



**1996 dedication of the Conte Building** - (left to right) John Olver, Corinne Conte & David Scott (UMass Chancellor).

Tirrell. Hoagland, a chemical engineer from Princeton was interested in polymer transport and rheology. Tirrell, the first PSE alumnus to join the ranks of the faculty, had already started an academic career at Carnegie Mellon, and back at PSE, he began to focus on protein synthesis using recombinant DNA techniques. In 1988, MacKnight resumed the Headship of PSE, following the departure of Thomas for MIT. By 1991, Chien and Lenz had also transferred to PSE making the Department home to the vast majority of faculty engaged in polymer research on campus.

The same year, the state approved \$32 million for the new building. Because these funds were subject to the issuing of bonds, some uncertainty remained over the ultimate timing of the project. Over the next several years, plans for the building were formulated and the funding was secured. Finally, in 1991, a groundbreaking ceremony was held in the presence of then Governor William Weld and other dignitaries. It was decided to name the building in honor of Silvio Conte, the legislative champion of the project who had recently passed away.

The federal funding for the new building came with the mandate that a significant portion of the money be used to purchase equipment. This afforded a fantastic opportunity to recruit new faculty with the very attractive promise of first class research space and state-of-the-art equipment. The first such appointment was Scott Barton in 1990, whose research exploited newly established X-ray facilities. A second appointment, Sam Gido, Thomas' first student at MIT, was hired as an expert in electron microscopy and characterization of polymer morphologies. Four other faculty appointments followed as the move to the new building began in 1994, Alan Lesser, a civil engineer from Shell, Bruce Novak, an organic polymer chemist, Klaus Schmidt Rohr, an NMR specialist, and Tom Russell, the 2nd

PSE alumnus to join the faculty, who joined from IBM.

With these 6 appointments and faculty already in place, PSE occupied a leading place in among polymer research and education organizations. The alumni held important positions in both academia and industry around the world. In a 1995 National Research Council Report, "Research Doctorate Programs in the US", PSE was ranked 7th in terms of Scholastic Quality of Program Faculty and 2nd for Effectiveness in Educating Research Scholars/Scientists among Materials Science programs.

In 1995 MacKnight stepped down from the headship (for a second time) and was succeeded by Dick Farris. 1996 saw the dedication of the new Silvio O. Conte building. To mark the occasion, UMass awarded honorary doctorates to Catherine Coleman, a PSE alumna and NASA astronaut; Roger S. Porter, the first PSE Head; and Walter Stockmayer, a pioneer in polymer science.

With a new home and the largest faculty size yet, PSE was poised to enter the next century with forward momentum. The next 20 years saw a number of developments of prime importance; these will be subject of the third part of this history.

*In the next issue: Part III, from a new home to a new century...*



The newly built Conte National Center for Polymer Research (c.a. 1998).

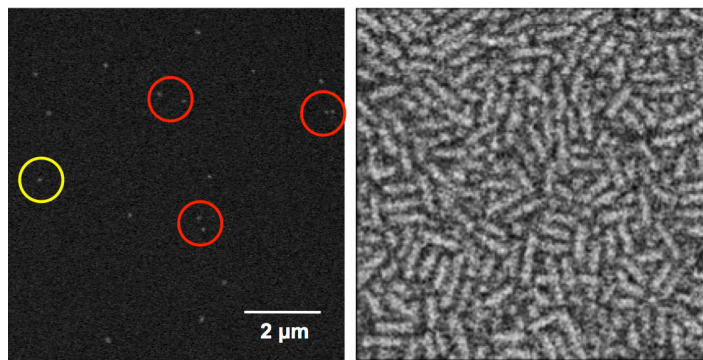
## PSE Highlights

### Watching Nanoparticles Move

Events at the nanoscale are too small to visualize by ordinary optical microscopy, which doesn't resolve features much less than the wavelength of light, leaving electron microscopy, with its potentially much higher magnification, an obvious alternative. But the chamber of an electron microscope is at high vacuum, nearly precluding examination of liquid-like or solvated samples, those with the most interesting dynamics.

Circumventing this limitation, a new methodology for imaging nanoscale objects dispersed in ionic liquids via electron microscopy has been developed by PSE graduate student, Paul Kim, and his advisors, David Hoagland and Tom Russell. Displaying negligible volatility, ionic liquids are stable in vacuum, and this feature facilitates *in situ* electron microscopy of suspensions, gels, and other 'soft matter' systems.

Displayed below at left is a single frame of a scanning electron microscopy movie tracking 90-nm diameter silica nanospheres in a 40-nm thick free-standing ionic liquid film. The individual spheres, too small to visualize by optical microscopy, are well resolved as they undergo irregular 2-D Brownian motion. A complex, poorly understood interplay of capillary and hydrodynamic interactions causes neighboring spheres to pair at large separations, 'swirling and dancing' together as they occasionally switch partners. The right image shows a single frame of densely packed 393 by 103 nm silica nanorods locally ordered/disordered by thermal fluctuations into/from short stacks. This microscopy method is now being applied to dynamics during polymer crystallization and gelation. A manuscript describing the imaging technique and its application to nanoparticle dynamics is currently under review.



*Left:* nanospheres in ionic liquid film circled in red are separated but paired and those circled in yellow are not; *Right:* nanorods packed in a two dimensional film.

### Soft Materials for Life Sciences Traineeship

This fall marks the kick-off of a newly funded graduate traineeship program led by faculty in PSE. The program, Soft Materials for Life Sciences, is funded by a \$2.975 million, five-year award through the NSF's National Research Traineeship (NRT) program to train a group of graduate students from different disciplines in the use of polymers and other soft materials in the life sciences. Like the previous NSF IGERT program, the focus of the NRT program is graduate training through research, to prepare them for a range of careers both inside and outside academics. The SMLS traineeship is the first NRT to be awarded to the UMass campus.

Ken Carter, who co-directs the program with colleague Greg Tew, says the NRT will engage 74 students over five years in polymer science and engineering, immunology, food science and several engineering fields. One goal is to explore new models for graduate education, including a concept known as T-shaped skills, where the vertical bar of the letter represents the depth of the student's skills and expertise in a core discipline, while the horizontal bar represents his or her ability to communicate effectively with experts in other areas as well as with non-experts. Developed together, they allow a scientist to share and apply knowledge in areas other than in one's core field.

This approach has had proven success, yet until now collaborative skills were rarely taught at the undergraduate and graduate level in a deliberate, organized way. It is time to change that, say Carter, Tew and colleagues. "Students need to be trained to communicate, lead and participate effectively in diverse teams," they state, which means learning to effectively convey their ideas to others and work toward common goals.

Students who successfully complete the two-year training program will receive a graduate certificate in Soft Materials for Life Sciences. "The program is designed to serve both master and doctoral students in the science and engineering workforce," Carter notes, "and many of them will direct their careers beyond research or academia to work in industry, government and teaching-intensive professional jobs."

For the UMass Amherst NRT, the overall research focus is at the intersection of soft materials, especially polymers, and their application in the life sciences, with an emphasis on sensor design and immunology. Training

will involve interdisciplinary studies and a variety of other experiences to address goals in life sciences such as developing drug delivery methods and personalized health monitoring devices.

Connections to industry are built into the program through the UMass Institute for Applied Life Sciences and will benefit the trainees as well. Carter adds, “This training is essential for preparing highly skilled students for the modern economy of the 21st century.”

## Digital Archive for PSE Theses and Dissertations

In 2013, The UMass Amherst Libraries embarked on an ambitious program to digitize all theses and dissertations of the University. These research works have been available in electronic format since 1997 for dissertations and 2007 for theses, but public online access has not been available. Other dissertations and theses have long been available only in print. In total there are over 24,000 UMass dissertations and theses to archive, and the project is expected to take over 10 years to complete.

To kick-off the digitization effort, the library has decided to focus first on the rarest and oldest collections, as well as the complete collections from a few departments, including PSE. Open access of the digital archive promises to magnify the reach of these works. “The goal is to increase the use and visibility of this major collection of UMass research products by making them open access, or online and free of charge” says Jessica Adamick, project manager for the Libraries’ digitization effort, adding “Open access blows print and priced-tolled research out of the water in terms of use, and we want our alums to benefit from it”. For example, dating only from the start of the archive in 2007, the most recent 6 years of PSE dissertations have already been downloaded more than 20,000 times.

Paulina Borrego, librarian at the UMass Science and Engineering Library recommended PSE to be the first department from the College of Natural Sciences to be digitized. She remarks, “Helping with this project gave me a first-hand view of the development of department research over time. From the very first dissertation in 1969 ‘The Physical Properties of Polyurethanes and Ionomers’ by Tisato Kajiyama to the most recent, one sees long-term trends and shifts in the research focus. In the early years, the research tended to be focused on establishing physical and synthesis benchmarks; physical properties, detection techniques, and synthe-

sis routes. Later, with established norms defined, the research projects focused on applications branching out into all disciplines.” She adds, “What this project has taught me the most is the need for interdisciplinary resources that help researchers cross department boundaries and explore other fields with an eye towards creating new connections.”

Digitization of previously print-only PSE theses and dissertations was completed this past summer. With the exception of a small number whose authors have “opted out”, currently all completed theses and dissertations from PSE graduates are available through open access in ScholarWorks@UMass Amherst (<http://scholarworks.umass.edu/pse>).

## Alum to Establish PSE Scholarship

After many years of donating to the department, PSE alum, Lothar Kleiner recently made the decision to designate a portion of his estate to create a PSE scholarship. Commenting on this decision, he stated: “I am still closely connected with many of the faculty, and want to do my part to help incoming students.” Once fully funded, the Kleiner Family Scholarship will assist first year Polymer Science and Engineering students.



Lothar Kleiner

Lothar considers himself fortunate to have graduated from the PSE in 1978. “My UMass education provided me a strong foundation to pursue opportunities throughout my career in very diverse polymer-related industrial fields including traditional plastic, electronic, pharmaceutical and medical device.” In addition to his academic training, Lothar credits his advisors, Bill MacKnight and Frank Karasz, for challenging him to become a more confident and independent student.

Lothar chose to name the “Kleiner Family Scholarship” in recognition of his parents, who were an important part of his success, and played a special role in his opportunity to attend UMass. “Professor Otto Vogl, the PSE admissions director, called my home to inquire about the status of my application. Because I was vacationing in Austria, Professor Vogl spoke to my mother. They both quickly realized that they could speak with each other in fluent German. After

they ‘met’ over the phone, the decision was made: I would go to UMass Amherst to study Polymer Science. It ended up being one of the best decisions of my life. I’m happy to assist in providing opportunities for future polymer scientists to also attend UMass.”

## Organizational history of PSE

*Rafeal Burgos-Mirabal, Ph.D. candidate from Organization Studies program at the UMass Isenberg School of Management has undertaken a comprehensive study of the development of the PSE program at UMass. His research, which began in 2011, aims to learn what organizational and historical factors make for the growth and development of successful interdisciplinary STEM programs, with PSE as his primary “case study”.*



Rafeal Burgos-Mirabal

*Rafeal has agreed to share some notes (below) about the ongoing research into the organizational development of PSE, and further, would encourage any alums (especially early alums) who have unique perspectives on this history to contact him at [rburgosm@som.umass.edu](mailto:rburgosm@som.umass.edu).*

“PSE from an organizational perspective,”  
by **Rafeal Burgos-Mirabal**

As a student of organizations that produce STEM-related knowledge, the emergence of PSE at UMass continues to fascinate me. PSE rose to administrative autonomy at UMass from its parent disciplines of chemistry and chemical engineering. The number of accomplishments has been large indeed. Many times through history PSE seems to have functioned as an anchor site from which initiatives originating within PSE have spilled over to benefit other parts of the College of Natural Sciences. For that matter, at some junctures in the history of UMass, even the campus at large has benefited from PSE activity. The last two reasons are particularly relevant as the university transformed into a research-intensive institution from an agriculturally-oriented teaching-intensive state college in the 1930s, and through the post-war period (1945-1990s).

Besides these “organizational” aspects, there are also fascinating aspects that rather relate to the discipline of polymers, to changes in the chemical sciences and

the growth of interdisciplinary science writ large. For instance, the institutionalization of PSE activity on campus took place relatively ahead of the development of academic polymer science in America. Perhaps the only earlier comparable efforts are those at Brooklyn Poly (1942) and Akron (1957). By the mid-sixties, such processes of institutionalization were not taking place at “every other” university in the nation, but it singularly took place on this campus. PSE represents a successful case of early institutionalized boundary-spanning activity among several chemical and engineering sub-disciplines. This seems to have occurred as the polymer scientists sought organizational solutions to their simultaneously “pure” and “applied” scientific concerns. Given this, PSE-UMass has been, additionally, a successful case of inter-sector cross-pollination and negotiations among industry, government, and academe.

The suspicion guiding my research is that the institutionalization of PSE-UMass cannot be explained by any one factor alone, as I try to put together the pieces of the “emergence-of-PSE-activity-at-UMass” puzzle. This emergence seems to have been a somewhat complex effort involving factors that are, in turn, intertwined: (a) decisively, the initiative of highly motivated individuals played a role in translating opportunity-seeing into the institution-building efforts; (b) the acquaintance of these pioneering scientists with disciplinary models of research and scientific organization that existed outside of the academy; (c) the network of relations that these UMass scientists cultivated within their disciplinary and professional realms that enabled them to (d) enroll the “will” of the UMass campus administration—and even sometimes the state government—on several occasions at crucial moments in the history both of polymeric materials and of American higher education.

So far, my archival, oral-historical, and historiographic studies have made me focus primarily on the early years of the 1950s and the first half of the 1960s, especially the groundbreaking efforts of Professors Stein and MacKnight, then at the “parent” Chemistry department. I am now starting to turn in more detail to the important years of program- and department-formation, which span the later 60s and the 70s. During those years the capabilities of individuals such as Professors Karasz and Porter (in addition to Price, Lenz, Vogl, and others) come into focus. The abilities of these individuals to attract key organizational resources and their snowballing stature in the field, was indispensable in the institutionalization of the world-class center of research and training that PSE is today.

## PSE50 Banquet, Boston Fishing Pier, April 18, 2015



## PSE50 Alumni Seminar Series (Fall 2015 - Spring 2016)

September 18, 2015  
**Dr. YuanQiao Rao**, Dow Chemical

October 9, 2015  
**Dr. Eric George**, Johnson & Johnson

November 6, 2015  
**Dr. Vivek Prabhu**, NIST

December 4, 2015  
**Prof. Alyssa Panitch**, Purdue University

February 12, 2016  
**Prof. Kristi Kiick**, University of Delaware

March 4, 2016  
**Dr. Jay Dias**, Exxon-Mobil

## PSE Voices

This fall, we welcomed the 50th entering class of PSE. In honor of the department's anniversary, for this issue, we asked four alumni to respond to the following questions:

*“What advice would you offer to the students of the 50th incoming PSE class about how best to enjoy and benefit from their years at PSE? In other words, what’s the one thing you wish someone told you when you started your first year at PSE?”*

### Elizabeth Surles Sterner

**PSE Entering Year:** 2007

**PSE Advisor:** Bryan Coughlin

**Current Position:** Postdoc, Dept. of Chemistry, MIT

As a student of UMass PSE, you are a member of one of the most professionally, intellectually, and socially diverse academic communities in the world. It is very rare to find a department with such a variety of skills, knowledge and research projects, and even rarer to find one where collaboration ties everyone together so strongly. Exposure to this breadth and depth of experience will only become more valuable as you embark on your careers in academia, industry, government labs, technology transfer, and more.



Obtaining a PhD is hard work, and you will sometimes feel uncertain of your understanding of your work. I jokingly tell incoming students, “get used to feeling a little stupid”, because you are working to expand the borders of what is known about your research area. There aren't any textbooks anymore, you are writing the textbook as you perform and interpret your experiments. If you are truly pushing yourself to ask good questions, you should feel like you don't really know the answer yet. The good news is that you have lots of people to lean on, learn from, and bounce ideas off of. Your advisor and group members are just the first line, you can also pop in to see your friends and colleagues elsewhere in the department to get their take on your experiment. Take advantage of this! It's almost like having a secret weapon, having chemists, physicists, engineers and biologists so close by. The best science these days is interdisciplinary, and UMass PSE will set you up beautifully to work on the cutting edge of research.

### Tao Xie

**PSE Entering Year:** 1998

**PSE Advisor:** Jacques Penelle

**Current Position:** Distinguished Professor, State Key Lab of Chemical Engineering, Zhejiang Univ.



In thinking of what the most memorable things are as a PSE graduate student, a few things popped up immediately. Surprisingly, the first is how few courses (two) I took at PSE and yet still passed the cumulative exams. Even with those two courses, I have quickly forgotten everything about them yet still managed a somewhat notable career as a professor specified in polymer science. Sorry PSE professors, I don't mean you are wasting your time teaching. In truth, this had to do with me being an odd student, having obtained two Master's degrees before joining PSE.

In reality, what has made the biggest and long lasting impact on me are the culture of collaboration, the weekly seminars, and the PSE family network. The weekly seminars really broadened my knowledge base in ways that are otherwise impossible. The diverse points of view of those excellent speakers have shaped my of thinking as a scientist. The PSE culture, both the intense collaboration and the constant drive to be the best, has impacted myself and many other PSE alumni. As much as I dislike the “MBA style” of networking, the PSE family tie has always been quite essential. Being a PSE alumnus means that you always have a network of reliable top polymer scientists to count on, whether you need a strong recommendation letter or an expert to collaborate with, you want to organize a meeting with quality speakers, or perhaps you just don't want to feel too lonely at ACS. Of course, being a professor myself, I have a perfect place to recommend to my best students. Last but not least, almost fifteen years after my PSE days, I feel lucky that I know personally many of the professors who joined PSE after my days there.



## Rosanna Falabella

**PSE Entering Year:** 1975

**PSE Advisor:** Dick Farris

**Most Recent Position (retired):** Hexcel Corporation (1986-2012)

Prof. Grason was kind enough to ask me to write a few words about my graduate days in the PSE Department. Specifically, “what’s the one thing you wish someone told you when you started your first year at PSE?” I immediately thought, “Don’t miss any rugby matches”, since I missed the one where Doc Lawrence got into a fight and needed 17 stitches in his chin.



Seriously, I think the main item I wish someone had told me about well in advance was post-graduate positions, specifically the opportunities for study in other countries. If I had planned better, I would have continued my study of a foreign language or two, and been prepared to apply to an interesting lab in France, Switzerland, or even China or India. Many of my classmates did so, and formed lasting friendships and connections as well as broadened their research skills. So I missed my big chance to experience the 629 types of French cheese and instead had to be content with the 57 varieties of Heinz ketchup.

The second thing I wished I had thought about differently was more specific formal education in applied statistics and physics. The cross-disciplinary nature of polymer science became more and more evident as my career progressed, and I often found myself working on a variety of problems in thermodynamics, fracture mechanics, statistics, etc. that I had had little classroom exposure to. Studying topics like these on my own worked out, but I felt I could have beefed up my expertise while in school. So in addition to studying my Diels-Alder off to pass the cumes, I regret not studying even more!

In summary, my advice to the current generation of PSE students is to decide on your keenest areas of interest, and then perhaps look at some of the coursework outside of PSE to broaden your formal training. In addition, learn how to say, “I would like some cheese with that, please” in at least 8 languages, and you’ll be ready to take on the world!

## Ananda Chaterjee

**PSE Entering Year:** 1970

**PSE Advisor:** Frasier Price, Seymour Newman

**Current Position:** President, Chatterjee Consulting, LLC



For the incoming PSE class it is perhaps a good occasion to bring attention to community (PSE), camaraderie and friendship while you engage in your graduate studies. There will be opportunities to have a good time, enjoying both the Amherst area and

the PSE Department. You will realize, as I did, that the Department has much more to offer beyond formal education and degree. It is through the personal contacts and memories that networking will begin to roll and new vistas will open up.

Precious will be the interaction with your peers, professors and all. Good humor and the lighter side of life can provide a balancing act. When I was a PSE student, the late Professor Roger Porter’s sense of gentle humor provided levity in our busy student lives. It was a Saturday afternoon, following a payday; the cumulative exams (cume) were just over (what a relief !) and we had a departmental picnic. Dr. Porter asked one student who kept his hair long, “Did you get paid yesterday ?” After the student said yes, Dr. Porter laughed and joked, “I can see the pay did not go towards your haircut !”

Attending the seminars by visiting academic and industrial scientists regularly will broaden your horizons and perhaps inspire you in new directions. You will also find it beneficial to interact with faculty other than your thesis advisor and also their students, to gain fresh perspectives. These are good ways to soak in the PSE experience.

It will be essential for all of you to be proactive in safety in the laboratory and outside. Enjoy the journey of your learning process that can help you blossom into a well-balanced scientist and humanist. For now, explore and relish the frontiers of science and engineering, as they intersect with other disciplines.

# PSE Graduates

(December '14-November '15)

**Jonathan Pham** (A. Crosby)

December 8, 2014

“Mechanics of Helical and Fabric-like Mesostructures from Polymer-Nanoparticle Hybrids”

**Jinhye Bae** (R. Hayward)

December 14, 2014

“Assembly and Deformation of Amphiphilic Copolymers and Networks at Fluid Interfaces”

**Katherine Gibney** (G. Tew)

December 14, 2014

“Design and Synthesis of Polybetaines for Nonfouling Applications”

**Maria Cara Chiappelli** (R. Hayward)

December 18, 2014

“Tunable Photonic Multilayers from Stimulus-responsive, Photo-crosslinkable Polymers”

**Omkar Vyavahare** (S. Hsu)

December 22, 2014

“Investigation of Hydration Induced Structural Rearrangements of Poly(lactic acid)”

**Daniel King** (A. Crosby)

February 13, 2015

“Fabric and Soft Material Composites for Bio-inspired Adhesives and Prosthetics”

**Marcos Reyes-Martinez** (A. Crosby & A. Briseno)

February 20, 2015

“Mechanical and Electro-mechanical Properties of Crystalline Organic Semiconductors”

**Yujie Liu** (A. Crosby)

March 25, 2015

“Ultra-thin Polymer Films and Hierarchical Composites: Processing and Mechanical properties”

**Angela Cugini** (A. Lesser)

May 4, 2015

“Aspects of Physical Aging and Solid-State Processing of Polymeric Glasses”

**Sunzida Ferdous** (T. Russell)

May 22, 2015

“Morphology Evolution Mechanisms of Low Band Gap Polymer-Based Photovoltaics”

**Zachariah Page** (T. Emrick)

June 4, 2015

“Polymer and Fullerene Zwitterions: From Synthesis to Solar Cells”

**Isaac Bruss** (G. Grason)

June 9, 2015

“Geometry and Thermodynamics of Filament Bundles”

**Yu Cheng Chen** (A. Crosby)

June 9, 2015

“Effect of Processing History and Material Properties on The Growth Of Wrinkle Amplitude”

**Amir Azadi** (G. Grason)

June 11, 2015

“Emergent Structure of Multi-dislocation Ground States in Frustrated Assemblies”

**Ranadip Ganguly** (A. Lesser)

June 24, 2015

“Process-Structure-Property Relationship in Ultra High Molecular Weight PTFE and Double Network Epoxies”

**Luis Cajamarca** (G. Grason)

July 22, 2015

“Elasticity and Geometry in Curved-Filament Assemblies”

**Cheng Li** (J. Watkins)

September 10, 2015

“Refractive Index Engineering and Optical Properties Enhancement by Polymer Nanocomposites”

**Brittany deRonde** (G. Tew)

September 18, 2015

“Design of ROMP-based Protein Mimics for siRNA Delivery”

**Byoung-Jin Jeon** (M. Muthukumar)

September 24, 2015

“Voltage Driven Translocation of Polyelectrolytes Through Nanopores”

**Rohit Kothari** (J. Watkins)

October 21, 2015

“(I) Polymer Nanocomposites: Rheology and Processing for Mesoporous Materials and (II) Rapid Nanopatterning of Metal Oxides Using Soft Lithography”

**Ning Ouyang** (M. Muthukumar)

October 22, 2015

“Translocations of Ring and Linear Polymers & Polyelectrolyte Brush in Salty Solution”

**Hsin-Wei Wang** (T. Russell & T. Emrick)

November 16, 2015

“Solution, Interfacial, and Interlayer Studies of Electronically Active Polymers”



**Attendees of Spring 2015 Graduation:** (back row, from left) Xiaobo Shen, Cathy Walker, Marcos Reyes-Martinez, Sami Fakouri, Omkar Vyavahare, Mike Bartlett; (middle) Maria Chiappelli, Jinhye Bae, Sirinya Chantarak, Irem Bolukbasi, Yan Wang, Polina Ware; (front) Jonathan Pham, Daniel King

## Alumni Honors

**Emmett Crawford** - 2015 ACS Heroes of Chemistry Award

**Qi-Feng Zhou** - Elected Vice President of IUPAC

**Ananda Chatterjee** - Outstanding Service Award, from Texas A&M University; Associate Editor, Journal of Plastic Film & Sheeting

## Faculty Honors

**Alex Briseno** - ACS-Advanced Materials Interface Young Investigator Award; U Texas A&M Distinguished Diversity Lecturer in Chemistry

**Al Crosby** - Samuel F. Conti Fellowship, UMass; Elected to the National Academy of the Inventors

**Ken Carter** - Poly Distinguished Service Award

**Todd Emrick** - 2015 Carl S. Marvel Creative Polymer Chemistry Award

**Tom McCarthy** - International Award, Society of Polymer Science, Japan

**Maria Santore** - Grace Hopper Lecturer, UPenn

## Student Honors

**Anesia Auguste** - 2014 Presentation Award, Society for the Advancement of Chicanos/ Hispanics & Native Americas in Science

**Coralie Backlund** - 2015 Fullbright Scholar

**Ben Cherniawski** - ACS Best Poster Award

**Jaewon Choi** - Samsung Fellowship

**Connor Evans** - Society of Plastics Engineers Fellowship; Best Poster Award, Cabot Student Material Research Forum

**Xiaodan Gu** - Advanced Light Source Student Fellowship

**Yinyong Li & George Chang** - First Prize UMass Innovation Challenge

**Brendan Ondra** - Santos Go Award, PSE

## Alumni Giving

We are always so grateful for the generous support of our alumni, which is a vital source of support for the first-year graduate students in PSE. Contributors from Dec. 2014 to Nov. 2015, are listed below. Thank you!

### >\$10,000

David Lipp Foundation ('71)  
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