

Spring 2019

# *dimensions*

*Department of Physics & Astronomy*

## ***In this issue:***

***First Regional Conference for Undergraduate Women in Physics (CUWiP)***

***2019 Walter and Christine Heilborn Lecture Series***

***Annual "Rapid Fire Research" contest***

**Northwestern University**



## Faculty News

Congratulations to **Fred Rasio** named [AAAS fellow](#). He was honored on Saturday, Feb. 16, 2019 at the AAAS Annual Meeting in Washington D.C.

UNESCO has announced they will establish a Chair on Fundamental and Interdisciplinary Physics at Northwestern University. The position is established in support and recognition of the [Colegio De Fisica Fundamental E Interdisciplinaria De Las Americas \(COFI\)](#), located in San Juan, Puerto Rico. **Prof. Mayda Velasco** serves as General Director of COFI and will hold the UNESCO Chair Professorship at Northwestern University.



United Nations  
Educational, Scientific and  
Cultural Organization



UNESCO Chair on Fundamental  
and Interdisciplinary Physics for  
the Americas at Northwestern University

Congratulations to **Raffaella Margutti**, awarded the [SLOAN Fellowship](#) in Physics and her research on "The Cow" received major press from multiple [media outlets](#). "The Cow" was the focus of a Press Conference at the 2019 AAS meeting in Jan. 2019.

**Prof. Claude-André Faucher-Giguère** was named a [Scialog Fellow](#) by the Research Corporation for Science Advancement.

**Professor de Gouvea** speaks at [Kavli Foundation Plenary](#) session to speak about recent advances in neutrino physics.

**Professor Margutti's** [Paper Among Top Ten in 2018](#) on observations of the binary neutron star event GW170817.

CIERA's **Aaron Geller** Awarded [LSSTC Enabling Science Grant](#) to Fund Undergraduate Research.

Lecture by CIERA Associate Director **Shane Larson** was Featured in ['Astronomy' Magazine](#).

**Professor Mayda Velasco** was featured in [Northwestern Now](#) discussing her training as a graduate student here at Northwestern, her work at CERN, including the Higgs boson, and her current major project: COFI.

Congratulations to **Professor Claude-André Faucher-Giguère** for obtaining tenure in the Weinberg College of Arts & Sciences!

**Prof. Motter's** work was recently featured in:

- Quanta Magazine, April 4, 2019: Scientists Discover Exotic New Patterns of Synchronization, by Natalie Wolchover, <https://bit.ly/2VtObn9>
- Nature Physics 14, p. 1149, December 2018: The Subtle Success of a Complex Mindset, Editorial, <https://go.nature.com/2UnhRG8>
- Nature 564(7736), December 20/27, 2018: All Systems Go in Shanghai for Connecting Innovators, Conference Report, <https://go.nature.com/2G1lasO>

**Sasha Tchekhovskoy** Receives [2019 High-Performance Computing Award](#) for his research proposal, Simulating Neutron Star Binary Merger Remnant Disks and Tilted Thin Disks.

### *In memory of Koichiro Nishikawa*

Koichiro Nishikawa worked with Dave Buchholz and earned his PhD from Northwestern in 1980. He was the founder and leader of the K2K and T2K neutrino experiments which played a crucial role in establishing the fact that neutrinos have mass.

For this, he and his collaborators were given the [Breakthrough Prize in Fundamental Physics in 2016](#).

## Selected Publications and Invited Lectures

J.D. Hart, Y. Zhang, R. Roy, and A.E. Motter, Topological control of synchronization patterns: Trading symmetry for stability, *Phys. Rev. Lett.* 122, 058301 (2019).

Prof. Motter's group authored a new video, titled "Janus Oscillator Networks", available at <https://bit.ly/2FUPwNp>, which presents in non-technical terms the myriad of behaviors exhibited by the new class of network systems introduced in Z.G. Nicolaou, D. Eroglu, and A.E. Motter, Multifaceted dynamics of Janus oscillator networks, *Phys. Rev. X* 9, 011017 (2019).



Martizzi, D., Quataert, E., Faucher-Giguère, C.-A., & Fielding, Drummond 2019, "Simulations of jet heating in galaxy clusters: successes and challenges," *MNRAS*, 483, 2465.

Ye, Claire S.; Kremer, Kyle; Chatterjee, Sourav; Rodriguez, Carl L.; Rasio, Frederic A. 2019, "Millisecond Pulsars and Black Holes in Globular Clusters" <http://adsabs.harvard.edu/abs/2019arXiv190205963Y>.

Xinyuan You, J. A. Sauls, and Jens Koch. 21 May 2019, "Circuit quantization in the presence of time-dependent external flux" [Phys. Rev. B](https://arxiv.org/abs/1905.11452) 99, 174512.

An Embedded X-Ray Source Shines through the Aspherical at 2018cow: Revealing the Inner Workings of the Most Luminous Fast-evolving Optical Transients  
Raffaella Margutti, et al.  
<https://iopscience.iop.org/article/10.3847/1538-4357/aafa01/meta>.

Observations of Spin-Down in Post-Main-Sequence Stars and the Possibility for Blue Straggler Gyrochronology  
Emily Leiner, Robert Mathieu, Natalie Gosnell, Alison Sills  
<https://arxiv.org/pdf/1812.02181.pdf>.

The Binary Neutron Star Event LIGO/Virgo GW170817 160 Days after Merger: Synchrotron Emission across the Electromagnetic Spectrum  
R. Margutti et al 2018 *ApJL* 856 L18  
<https://iopscience.iop.org/article/10.3847/2041-8213/aab2ad>.

FIRE-2 simulations: Physics versus numerics in galaxy formation  
Claude-Andre Faucher-Giguere, et al.  
<https://doi.org/10.1093/mnras/sty1690>.

A Precise Distance to the Host Galaxy of the Binary Neutron Star Merger GW170817 Using Surface Brightness Fluctuations  
Wen-Fai Fong, et al.  
<https://iopscience.iop.org/article/10.3847/2041-8213/aaad64/meta>.

Brightening X-Ray Emission from GW170817/GRB 170817A: Further Evidence for an Outflow  
Vicky Kalogera, et al.  
<https://iopscience.iop.org/article/10.3847/2041-8213/aaa4f3/meta>.

LISA Sources in Milky Way Globular Clusters  
Shane Larson, Frederic Rasio, et al.  
<https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.120.191103>.



## Research Staff and Graduate Student Achievements

Postdoctoral Associate **Erin Cox** won the Robert L. Brown [Outstanding Doctoral Dissertation Award](#), administered by Associated Universities, Inc. (AUI) and the National Radio Astronomy Observatory (NRAO).

Graduate student **Zachary Hafen** creates "[Vault, a student-led data expedition for high schoolers](#)". Vault is an opportunity for students to dive deeply into a subject that they care about with the support of Hafen as a mentor, guiding them through the research process and helping them answer questions in the same way researchers would.

Graduate Student **Monica Gallegos Garcia** was awarded the Ford Foundation graduate fellowship.

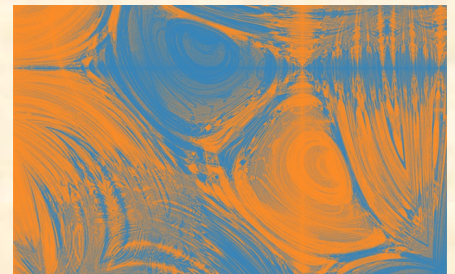
**Phalguni Shah** won an APS GSOFT travel award to present her research at the 2019 APS March Meeting. These awards are given in recognition of the quality of work presented at the meeting.

Graduate student **Ingrid Stolt** wrote about "The Magic of Magnets" in an [online magazine Helix](#).

**Keenan Avers** and group (Halperin) made a bulk single crystal ingot of UCoGe via float zone refining, which is a ferromagnetic unconventional superconductor. This material is relatively new (first investigated in early 2000s), and pushes our understanding of superconductivity into uncharted and not well understood territory.

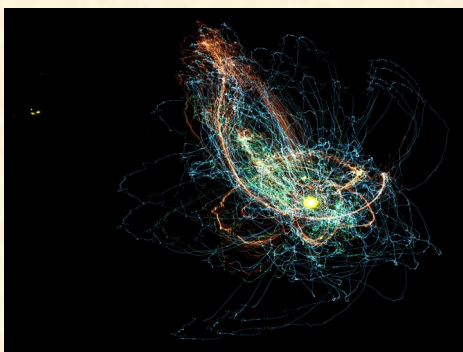
**Yuanzhao Zhang** came in first place in the 2018 [Northwestern Scientific Images Contest](#) for image on joint work with **Prof. Motter**, Dec 12, 2018.

**Carl Rodriguez**, Professor **Rasio's** previous PhD student, accepted a tenure-track faculty position in the Physics Department at Carnegie Mellon University.



*Yuanzhao Zhang 2018 image.*

First-year Astronomy PhD student **Lindsey Byrne** was awarded a prestigious DOE Computational Science Graduate Fellowship. This fellowship recognizes promise and excellence in computational research across all fields of science and engineering. Lindsey works in computational galaxy formation in the **Faucher-Giguère** group.



*Gurvich & Hafen "Galactic Bloom" image.*

Graduate students **Alex Gurvich** and **Zach Hafen** were awarded the Student Choice Award for the scientific visualization "Galactic Bloom" submitted to Northwestern's Science in Society scientific images competition. This prize-winning image was produced from a galaxy formation simulation developed at Northwestern.

["Astronomy Picture of the Day"](#) Featured Results from SOFIA's HAWC+ Instrument, Developed by **Prof. Giles Novak** and CIERA visiting scholar **Marc Berthoud**.

Graduate Student **Paul Williams** was one of 15 researchers who embarked on a two month long trip to a volcanic island in Antarctica last winter to [research star formation](#).

Graduate Student, **Michael Zevin**, Research [Featured in AAS Nova](#).

Eight New Postdoctoral Researchers [Join CIERA](#). Welcome Nancy Aggarwal, Jeff Andrews, Adriano Baldeschi, Peter Blanchard, Alicia Rouco Escorial, Giacomo Fragione, Mike Gudric, Patrick Sheehan & Michael Stroh.



## 2019 Rapid Fire Research

*Congratulations to the winners of this year's Rapid Fire Research. We thank everyone who participated in this event!*

### First Place

James Dragan: "Nondestructive State Readout of Molecular Quantum States"

### Second Place

Keenan Avers: "Single Crystal Growth of Uranium Based Superconductors"

### **Congratulations to Class of 2019 Physics and Astronomy Majors!**

**Theodore Baker**

**Mark Berger**

**Vivian Chen**

**Chandler Conn**

**Binghao Guo**

**Haoxiang (Kevin) Huang**

**Nathan Hung**

**Nathan Huxtable**

**Julie Malewicz**

**Alexis Martineau**

**Ethan Marx**

**Shaam Nobel**

**Luke Peterson**

**Anastasia Petrik**

**Shiv Subrshmanian**

**Eric Van Camp**

**Isabelle Zinghini**

**Max Zoia**

## Dearborn Observatory Visiting Schedule

Spring/Summer Hours  
(April-September)

9-10 pm: One hour session by reservation only. Your group will be able to use the telescope for the full hour.

10-11 pm: Walk-ins are welcome, but space in the dome is limited.

*There is no charge for these Friday night tours; however, we do require a refundable deposit for groups of 10 or more. Additionally, the Observatory is available for private viewing events on other evenings. Reservations may be requested online at <http://www.physics.northwestern.edu/about/dearborn-observatory/>. For more information, please contact Yas Shemirani at 847-491-7650.*

## Department Outreach

### STEM outreach for Lakota girls – March 29-31, 2019

Alumna Ava Polzin organized the March 29 – 31 STEM weekend with a grant again from the Office of Institutional Diversity and Inclusion (OIDI) and an additional grant through the Center for Native American and Indigenous Research (CNAIR). This event was hosted by P&A and welcomed six Lakota girls and their teachers from Pine Ridge Reservation in South Dakota.



Northwestern's guests enjoyed a Magic of Physics show (Professor Art Schmidt), citizen science training (Professor Christopher Berry and UW-Madison PhD candidate Charee Peters), a special presentation at the Adler Planetarium (Professor Aaron Geller), a sleepover/observing session in Dearborn Observatory (graduate students Candice Stauffer and Aprajita Hajela, alumna Katie Barnhart), research talks from faculty members (including Professors Raffaella Margutti and Zosia Krusberg), and the well-attended cultural exchange dinner (co-facilitated by OIDI, CNAIR, and Professor Deborah Brown) during which indigenous star knowledge was shared in parallel with western astronomy. The now-established outreach is expected to continue after Ava leaves for graduate school: to plan for that, Professor Michael Schmitt met with her, CNAIR, OIDI, and a PAGSC representative in late June.

## Congratulations to our Undergraduate Awardees

- Outstanding Juniors in Physics & Astronomy: **Joshua Pritz, Kristopher Mortensen**
  - Outstanding Sophomore in Physics & Astronomy: **Andrew Kindseth**
  - Outstanding Undergraduate in Graduate Coursework: **Fiona Brady**
- **Eric Van Camp** has been awarded Physics and Astronomy 2018-2019 Departmental Honors.



# Welcome to Our New Staff Members



**Ayisha Ali**

*Business Administrator*

Ayisha Ali has joined the Department as our new Business Administrator. Ayisha has been with the University for 12 years, first as the Financial Administrator at INVO, and most recently she was the Research Administrator in the Department of Psychology.



**Bill Voltz**

*Financial Assistant*

Bill comes to us from the Department of Anthropology, where he was an Accounting Specialist for three years, receiving the WCAS Service Excellence Award in 2016. Prior to that he worked in Life Sciences Financial Services. He has also taught high school and played tenor saxophone.



**Kavi Munaretto**

*Financial Assistant*

Kavi was most recently a Supplier Relations Coordinator at Innerworkings, INC, a Chicago marketing services company. She is from Sri Lanka and used to compete in the National Diving Team there. She is fluent in Sinhalese, French, and English, and has a one year old puppy who has the same mass as she has!

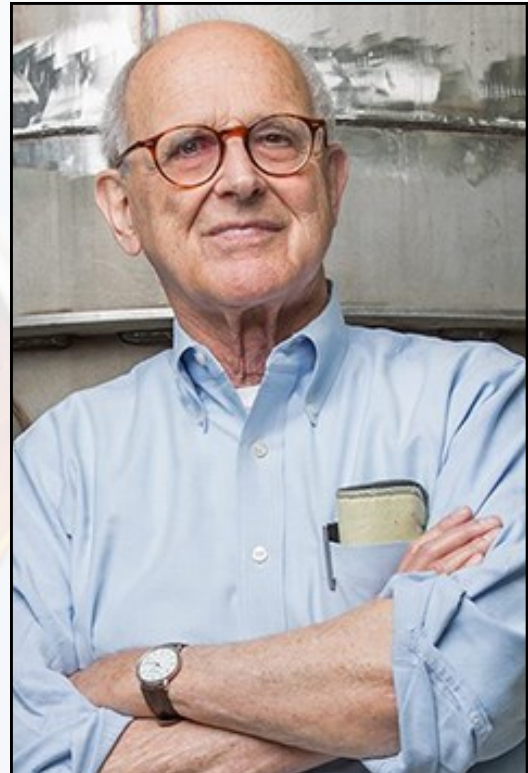


## Department Events

### Heilborn Lectures April 2019

Since 2001, the Department of Physics & Astronomy has invited distinguished scientists to deliver lectures supported by the Walter and Christine Heilborn fund. This year the lectures were held the week of April 2-5, 2019. Our guest lecturer was Professor Rainer Weiss, Professor of Physics (Emeritus) in Massachusetts Institute of Technology and Nobel Prize winner for Physics in 2017.

RAINER WEISS (NAS) is a Professor Emeritus at Massachusetts Institute of Technology (MIT). Previously Dr. Weiss served as an assistant physics professor at Tufts University and has been an adjunct professor at Louisiana State University since 2001. Dr. Weiss is known for his pioneering measurements of the spectrum of the cosmic microwave background radiation, his inventions of the monolithic silicon bolometer and the laser interferometer gravitational wave detector, and his roles as a co-founder and an intellectual leader of both the COBE (microwave background) Project and the LIGO (gravitational-wave detection) Project. He has received numerous scientific and group achievement awards from NASA, an MIT excellence in teaching award, the John Simon Guggenheim Memorial Foundation Fellowship, the National Space Club Science Award, the Medaille de l'ADION Observatoire de Nice, the Gruber Cosmology Prize, and the Einstein Prize of the American Physical Society. Dr. Weiss is a fellow of the American Association for the Advancement of Science, the American Physical Society, The American Academy of Arts and Sciences; and he is a member of the American Astronomical Society, the New York Academy of Sciences, and Sigma Xi. He received his B.S. and Ph.D. in physics from MIT. Dr. Weiss is a member of the NAS and served on nine NRC committees from 1986 to 2007 including the Committee on NASA Astrophysics Performance Assessment; the Panel on Particle, Nuclear, and Gravitational-wave Astrophysics; and the Task Group on Space Astronomy and Astrophysics.



Professor Weiss delivered lectures on April 2nd, April 3rd, and April 5th entitled "Gravitational waves: astrophysics, technical challenges and prospects for the future" , "The Gamble taken by the NSF with LIGO" & "Exploring the Universe with Gravitational Waves", respectively.



# Northwestern Hosts Regional Conference for Women in Physics– CUWiP

Over 160 undergraduate physics students from more than 50 institutions attended the American Physical Society Conference for Undergraduate Women in Physics (APS CUWiP), organized by Northwestern University's Department of Physics and Astronomy. One of 12 regional locations hosting the conference, the three-day event was held January 18 – 20.

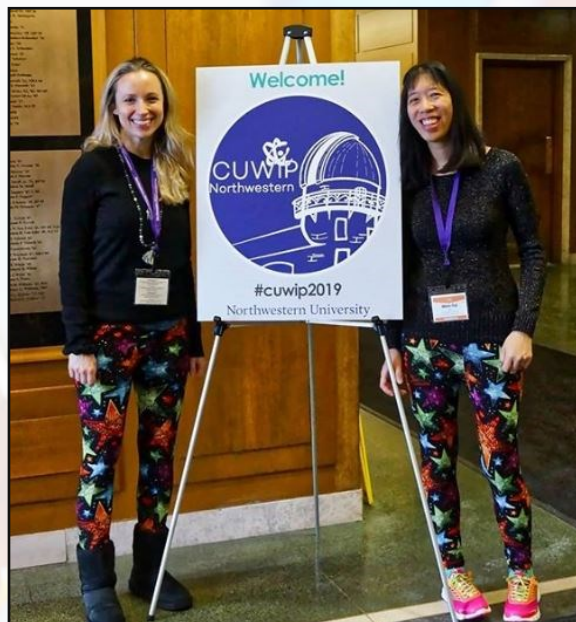
"It was a huge success, with women from the Midwest and Puerto Rico traveling to Northwestern to listen to talks, engage in discussion sessions, and to get to know each other," said Michael Schmitt, Chair of the Department of Physics and Astronomy.

The primary objective of CUWiP was to create a positive, supportive environment in which participants could reflect on and discuss issues tied to having a minority identity in the physics world. The conference also aimed to offer advice on how to succeed in undergraduate and graduate studies, information about careers in physics, and opportunities for participants to connect with other women in physics. Issues related to diversity and inclusion in the context of gender, race, ethnicity, sexual orientation, and socioeconomic status played a central role in the conference programming. Over one third of the speakers and panelists were people of color.

The conference opened with tours of Northwestern physics labs. Called the "Research Safari," the event allowed participants to witness the variety of work performed by physics researchers, from theorists and observational astronomers, to experimentalists analyzing big data and running experiments abroad. The Dean of the Graduate School, Professor Teresa Woodruff, gave a talk before the welcome dinner, and plenary talks from Northwestern faculty members Vicky Kalogera and Monica Olvera de la Cruz helped set the tone for the weekend.

Nearly 40 invited professionals from Northwestern, the Chicagoland area, and across state lines traveled in the snowy weather to serve as speakers and panelists to provide valuable insights to the young physicists. Presentations included Navigating Power Dynamics, Science Communication, and Networking. Panel discussions included Managing Imposter Syndrome, Graduate School Life, Mental Health, and Marginalized Identities, among others. A field trip to Adler Planetarium as well as a pizza party with a screening of the film *Hidden Figures* were also on the schedule.

[View the Northwestern CUWiP Website.](#)



Pictured: Co-chairs Zosia Krusberg and Wen-fai Fong





## Department Events and News

### Lunar Eclipse at Dearborn Observatory

A total lunar eclipse in single-digit temperatures occurred Sunday night on January 2, 2019, for over 500 people who ventured out to Dearborn Observatory for an event hosted by CIERA astronomers. Situated within the region for prime viewing of the total lunar eclipse, millions of people in North and South America had the opportunity to witness the supermoon turn red.



### Four New Gravitational-Wave Detections

New detections and analysis of gravitational waves – announced Saturday, Dec. 1, at the Gravitational Wave Physics and Astronomy Workshop in College Park, Maryland – broaden scientists' understanding of the entire population of stellar-mass black holes, which are formed from collapsing stars.

Four additional detections provide LIGO Scientific and Virgo Collaboration (LVC) scientists a sufficient amount of data to infer properties that apply to all stellar black holes. Most notably, the Compact Binary Coalescence Rates and Populations subgroup, co-chaired by Northwestern University's Chris Pankow, deduced that almost all stellar black holes weigh less than 45 times the mass of the sun. Continue to the full article [here](#).

### Undergraduate Egg Drop Event

The Society of Physics Students (SPS) hosted a Egg Drop Challenge with P&A faculty on Wednesday, February 20th, 2019. Students were given a chance to test their egg drop from a 2 story drop. The drop was filmed with a high-speed camera and provided a great opportunity for undergraduates to work with faculty in a casual setting.



### CIERA REU Students Present at 233rd Meeting of the AAS

This January, eleven students from CIERA's summer Research Experience for Undergraduates (REU) program and our LSSTC Enabling Science program [presented posters on their research projects](#) at the 233rd meeting of the American Astronomical Society (AAS) in Seattle, Washington.



## Graduate Student Recruiting and Open House 2019

The Department saw yet another new record for the number of PhD applicants (472). The Physics program had 284 applicants, while the Astronomy program had 188. We had 27 acceptances to the programs on only 59 offers of admission, marking our highest ever yield rates for both programs (51% in Physics, 50% in Astronomy). We have 21 new Physics students and 6 Astronomy students joining us in Fall 2019. This will put us at over 120 PhD students enrolled in Fall 2019. Our graduate student Open House was just as popular this year with 30 students attending. Our Master's program is also seeing much higher acceptance rates than in past years, with 14 new students accepting our admission offers. The faculty are very happy with the quality of the incoming class and we look forward to seeing how much they grow as scientists!

## CIERA Astronomers Use Machine Learning to Classify 1.5 Billion Astronomical Sources

The Zwicky Transient Facility (ZTF) is a new experiment attempting to identify everything that changes in the Northern night sky. ZTF measures these changes by repeatedly observing the same patch of sky every night to look for stellar explosions, known as supernovae, variable stars, and comets and asteroids. Once ZTF discovers an astronomically varying object, a critical challenge for ZTF is to determine whether the object is in our solar system (asteroids), the Milky Way galaxy (variable stars), or some other distant galaxy (supernovae). To address this issue, a group of ZTF researchers, led by CIERA astronomer Adam Miller, built a machine learning model to classify ~1.5 billion sources measured by the Panoramic Survey Telescope and Rapid Response System (Pan-STARRS). Read the full article [here](#).

## Successful event organized by COFI and NU

On March 11th, 2019 COFI and NU held an event, "Symposium: Women in Science and Technology" that was attended by 400 students. As part of Working Women's Week, conferences were offered by leading scientists, both at an international and national level, aimed at fostering interest in Science, Technology, Engineering, and Mathematics (STEM) for girls and young people in our educational system.



## Faculty Spotlight: Pulak Dutta

Prof. Dutta studies the surfaces of 'soft' molecular materials, and interfaces between soft and hard materials. The overall goal is to use concepts from statistical physics and condensed matter physics to understand how and when subnanoscale ordering in soft systems occurs, and how it determines physical properties. Soft materials are of particular interest because their structures are often easily changed in response to small changes in temperature, pressure, chemical environment, etc., resulting in a rich variety of phases and properties.

Much of the group's research is performed at synchrotron facilities, in particular the Advanced Photon Source at Argonne National Laboratory. Synchrotrons provide intense, narrow and highly-collimated x-ray beams, which are ideal for studying surfaces and internal interfaces. This allows the group to perform grazing-incidence X-ray diffraction (which looks at order within the surface/interface plane), reflectivity (which determines normal-to-interface profiles), fluorescence measurements (which yield element-specific information), etc.

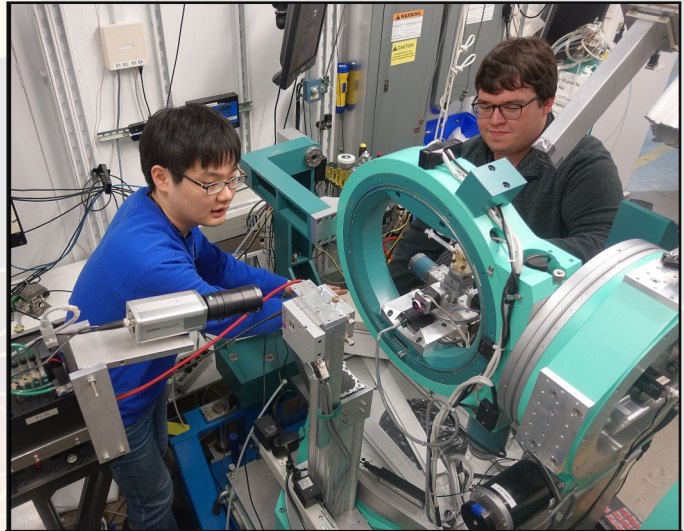
Among the systems being studied are metal ions at surfactant interfaces, which are relevant to colloidal mixtures of oil and water (e.g. paint, and Prof. Dutta's favorite example, salad dressing), and also to the industrial extraction of rare earths. This research is a collaboration with Prof. Monica Olvera. The group also studies electrolyte structure near electrodes; the soft-matter-guided growth of hard matter such as shells and bones; and non-liquid-like surface/interface structures in polar and nonpolar liquids.

### Recent Publications:

["Electrostatic origin of element selectivity during rare earth adsorption"](#), Mitchell Miller, Honghao Li, Miaoqi Chu, Sangjun Yoo, Wei Bu, Monica Olvera de la Cruz and Pulak Dutta, *Phys. Rev. Lett.* **122**, 058001 (2019).

### Honors and Awards

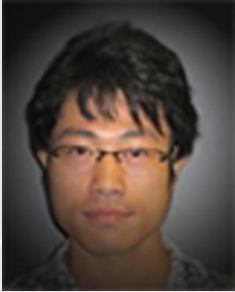
- Fellow, American Association for the Advancement of Science (AAAS)
- Fellow, American Physical Society (APS)



Group members Travis Douglas and Sangjun Yoo inside a synchrotron "hutch", setting up an experiment to study electrolyte structure near electrodes.



# Congratulations to our Graduate Students



Rempeng Fang (Shahriar)

Enhancing Sensitivity of an Atomic Interferometer to the Heisenberg Limit Using Increased Quantum Noise



Ming-feng Tu (Odom)

Micro-focused MHz Pink Beam for Time-resolved X-ray Emission Spectroscopy



John Gresl (Master's) (Dahl)

Acoustic Analysis of a Scintillating Xenon Bubble Chamber for Detecting Dark Matter



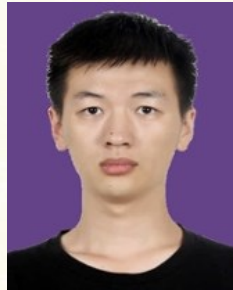
Joshua Wiman (Sauls)

Quantitative Superfluid Helium-3 from Confinement to Bulk



Marc Royster (Zadeh)

ALMA and GBT Study of the Ionized Gas Towards the Galactic Center



Junfeng Zhou (Master's) (Gabrielse)

ALMA and GBT Study of the Ionized Gas Towards the Galactic Center



Jonthan Trossman (Ketterson)

Nonreciprocal Spin Wave Propagation in Yttrium Iron Garnet in the Presence of Metals and Spin-Orbit Coupling



Michuan Zhou (Shahriar)

Investigation of fast light effect for gravitational wave detection and related applications to precision metrology

## Alumni Focus

**Alamgir Karim-** obtained his BS degree from St. Stephen's College, New Delhi in 1985, and obtained his Ph.D. in Physics from Northwestern University in 1991, doing research at Argonne National Laboratory using neutron reflectometry on polymer thin films in pioneering studies with Dr. Gian Felcher at Argonne and Dr. Tom Russell at IBM. He did a post-doc in Chemical Engineering at University of Minnesota with Profs. Frank Bates and Matthew Tirrell and joined National Institute of Standards and Technology (NIST) in 1993 and stayed there until 2008. At NIST, he held positions of Group Leaders of Polymer Blends and Processing Group, Combinatorial Methods Group, Director of NIST Combinatorial Methods Center, and Nanomaterials Groups. He won the NIST Bronze Medal award and shared the Silver Medal award for distinguished research. From 2009-2017, he joined the University of Akron's Polymer Engineering Department as the Goodyear Chair Professor of Polymer Engineering. He held positions of Co-Director, Akron Functional Materials Center and Associate Dean of Research and Institute Director at College of Polymer Science and Polymer Engineering at University of Akron. In 2017, he joined the Department of Chemical and Biomolecular Engineering at University of Houston (UH) as Dow Chair Professor, and holds positions of Director of the Materials Science and Engineering Program and Director of the International Polymer and Soft Matter Consortia. His areas of research include polymer nanotechnology of thin films, surfaces and interfaces related to energy, sustainability and human health. He has published over 230 papers with an H-index of 61, edited several books in these areas of polymer research, and organized several international conferences on these topics. He is a Fellow of the American Physical Society (APS) as well as Fellow of American Association for the Advancement of Science (AAAS) and recipient of Keck Foundation Award. His PhD Advisor at Northwestern was Prof. Pulak Dutta.

**Meghan Anzelc-** graduated with her PhD in June 2008. Since graduating, she has worked in a number of progressively more senior roles in data science and analytics, first in the insurance industry and now in the people and talent analytics space. Meghan is currently the Head of Data and Analytics for Spencer Stuart, a global executive search and leadership advisory firm, charged with building out data and analytics capabilities at the firm to better serve their clients and executives. Meghan is also regularly on campus to give back when she can. This year she was one of the career panelists at the Conference on Undergraduate Women in Physics (CUWiP) that Northwestern hosted in January 2019.

**May Eun Yeon Kim-** received their PhD from Northwestern in December 2015. May Eun then became a postdoc at Purdue University. Currently, she is a postdoc in the Ion Storage group at NIST in Boulder, CO (since September 2018).

### *Special Thanks to our Donors*

*The Department of Physics and Astronomy would like to sincerely thank all of our donors who contribute greatly to our mission. Our Department currently has 38 graduate faculty and 12 faculty at other ranks (instructional and research faculty). Our graduate program has about 120 graduate students and 42 full-time Postdoctoral Research Fellows associated with it, along with a varying number of Visiting Scholars and other distinguished guests. In most years, we have about 60 undergraduate majors in our department, many of them working in our research programs.*





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*The department newsletter is a means of reaching out to the alumni to keep them abreast of current research and developments in the Department of Physics and Astronomy. It is also a forum for alumni to keep the department informed of their accomplishments; the department welcomes submissions from alumni of newsworthy items for publication in the newsletter. Please feel free to email your news to Yas Shemirani at [yassaman.shemirani@northwestern.edu](mailto:yassaman.shemirani@northwestern.edu)*

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Please take the time to join our [LinkedIn](#) page for our alumni.

Follow us on [Facebook!](#)



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For more information about our department, please visit [www.physcs.northwestern.edu](http://www.physcs.northwestern.edu)