

▶ NOTE FROM THE CHAIR

A record of 33+ years of continuous funding from the National Science Foundation—this unique distinction was recently achieved by **Professor Alex Kostinski**, affirming the importance of his work in the field of atmospheric and statistical physics. The results of his research have been published in high-impact journals such as *Nature* and *Physical Review Letters*. His work has had broad impacts on the understanding of the physics of clouds and is highly cited by his peers in the scientific community. His recent NSF-supported project is on “Texture of Stochastic Process in Physical and Radar Meteorology.”

Physics graduate students **Dan Yeager** and **Lucas Simonson** are recipients of the SMART graduate fellowships offered by the U.S. Department of Defense (smartscholarship.org/smart). Dan works with **Professor Raymond Shaw** in Atmospheric Physics, and Lucas works with **Professor Ramy El-Ganainy** in the field of quantum information. These fellowships provide educational and workforce development opportunities facilitating a transition from fundamental research to applied technology.

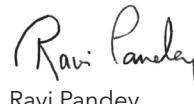
Professor Petra Huentemeyer is Michigan Tech’s 2022-23 Distinguished Professor. She was recognized for her substantial contributions to the University and the scientific community at large. She has been one of the lead scientists in the High-Altitude Water Cherenkov Observatory (hawc-observatory.org/collaboration), an international collaboration of more than 130 scientists from 37 institutions in the US, Mexico, Europe, South America, and Asia. Huentemeyer is regarded as a foremost expert in high-energy gamma-ray astronomy and galactic cosmic rays, nationally and internationally.

This year has been among the most difficult ones in bearing the losses of **Professors Emeriti Don Beck and Max Seel**, and **Instructor/Lab Associate Doug Wilken**. Don and Max joined the department more than 35 years ago as part of MTU’s initiative to develop research and PhD programs in computational physics. Don’s work on the electronic structure of lanthanide ions is highly recognized by his colleagues. Max was a scholar in the theory of materials focusing on semiconductors, where he made numerous seminal contributions to the field. Doug excelled in sharing his knowledge of experimental physics with students. They will always be remembered for their great contributions to education, advances in science, and involvement in the MTU community.

Professor Jacek Borysow is to be commended for his efforts to strengthen our commitment to providing undergraduates with a solid background in the principles of physics, together with extensive research experience in state-of-the-art laboratories. In the past four consecutive years, students working in his laboratory were lead authors on research publications—most recently **Trevor Kieft**, who published an article in *Review of Scientific Instruments*. Kieft worked on designing and developing a new instrument based on Raman scattering to map the spatial distribution of water vapor concentration in the atmosphere (doi.org/10.1063/5.0078784).

Many of these achievements were possible only with your encouragement and support. As you decide on end-of-the-year donations, please consider contributing to the department’s endowment at mtu.edu/physics/giving. Your continued support of the physics department’s efforts in education and research is deeply appreciated.

Best wishes for a joyous holiday season and a happy and prosperous New Year.



Ravi Pandey
Professor and Department Chair
pandey@mtu.edu

▶ RESEARCH SPOTLIGHT

Professor Alex Kostinski recently celebrated 33 years at Michigan Tech and the National Science Foundation (NSF) has provided funding for his research over all these years! This record-breaking and continuous financial support from NSF is a testimonial to the importance of his work, which contributes to fundamental knowledge in diverse areas of atmospheric physics, remote sensing, radar meteorology, statistical signal and measurement analysis, fluid dynamics, optical polarimetry, exoplanets, and materials physics. The outcomes of his research have broadly impacted many areas of science. His work has been published in highly rated research journals, often cited by his peers. Moreover, the work has even found its way into some textbooks.



During his tenure at Michigan Tech, Kostinski has achieved many career milestones, including receipt of the University’s Research Award in 2004. Early in his career, he worked on foundations of radar meteorology, focusing on raindrop distributions. In one highly cited paper, his “speedy raindrop” discovery challenged the long-held assumption that raindrops travel at terminal velocity (*Geophysical Research Letters* 36, 2009). This discovery fundamentally changed the design of a new generation of weather and climate models. In a decade-long collaboration with the Weizmann Institute in Israel, Kostinski successfully addressed multiple topics related to the understanding of the physics of the Earth’s atmosphere, including the theory of rain formation, cloud aerosol interactions, and radiation transfer in a cloudy atmosphere (*Nature Geoscience*, 669, 2021). Kostinski’s most recent work in the field of mathematical aspects of data analysis, “Extraction of unknown signals in arbitrary noise” (doi.org/10.1103/PhysRevE.103.022130), is an exciting new development that can significantly improve the extraction of information collected by radars, lidars, and satellites. Over the years, Kostinski has mentored several MS and PhD students currently gainfully employed in academia and industry. He is an inspiration for the young faculty members in the department—a true intellectual of science and a man for all seasons ranging broadly over many areas of physics.

IN MEMORIAM



Instructor/Lab Associate Doug Wilken passed away January 28, 2022, in St. Cloud, Minnesota. As a graduate student at Michigan Tech, Wilkens worked with Professor Bryan Suits, receiving an MS (1988) and PhD (1993) in Physics. After completing a postdoctoral fellowship at the University of Florida, he joined the corporate world for 20 years, working in Minneapolis. He returned to

Michigan Tech in 2016, teaching laboratory courses in optics, electronics, and modern physics, providing demonstration support for a variety of physics classes, and managing a group of undergraduate students—his “Demo Crew.”

One of Wilken’s true passions was sharing his knowledge of experimental physics with students. In this endeavor, he practiced continual self-examination and improvement, finding better ways of getting across main ideas and techniques that students would be able to use no matter where they found themselves. His greatest passion, however, was spending time with all of his family—and in recent years, he especially enjoyed being “Grandpa” for his granddaughter for as much time as he could.



Professor Emeritus Don Beck passed away May 11, 2022, in Greer, South Carolina. Beck joined the department in 1980 as part of an initiative to develop our research and PhD programs. Much of Beck’s work at Michigan Tech centered on computational atomic physics applied to transition and rare-earth metal ions. He retired in 2016 having published over 150 scientific papers. He received

funding from many sources, most notably for his ongoing work on lanthanide ions, which received continuous NSF funding for over 30 years. Most notably, he helped develop and provide leadership for the graduate programs in the department. As a principal advisor, he graduated 10 PhD and six MS students. At the University level, he was particularly active as an advocate for the Van Pelt and Opie Library and improved faculty benefits.

He was a friend, colleague, and mentor to many in the department.



Professor Emeritus Max Seel, who was also a former provost and vice president of academic affairs at Michigan Tech, passed away September 14, 2022. Seel was a beloved member of the Tech community, leaving his native Germany in 1986 to join the University faculty as an associate professor of physics. Over the course of his three-decade career, Seel served as dean of the College

of Sciences and Arts from 1991 to 2008, as interim provost in 2009, and as provost and vice president of academic affairs from 2010 to 2015. He was a scholar-teacher, publishing more than 85 research papers related to electronic structure theory, several of which were published after he stepped down as provost and returned to the physics faculty.

Seel is remembered by his colleagues for his sharp intellect and great sense of humor. Many have expressed that he was a calm, steady presence in rough times and someone who helped people talk through issues to reach the best possible outcome.

RECENT FUNDING

Distinguished Professor Raymond Shaw is the PI of a project that has received a \$2,903,682 research and development grant from the NSF. Shaw, co-investigators **Professors Will Cantrell and Claudio Mazzoleni** and **Assistant Professor Kartik Iyer**, and researchers from institutions across the country will collaborate on the project, titled “A Community Laboratory Facility for Exploring and Sensing of Aerosol-Cloud-Drizzle Processes: The Aerosol-Cloud-Drizzle Convection Chamber.” The proposed ACDC2 cloud chamber will be a world-class facility, capable of producing droplets up to the size of drizzle while allowing air motion analogous to that in real clouds.

Professor Will Cantrell is the PI of a project that has received a \$578,610 research and development grant from the U.S. Department of Energy, Office of Science, Atmospheric System Research. The project is titled “Laboratory Investigations of Aerosol-Cloud Interactions in an Entraining, Turbulent Environment.” **Distinguished Professor Raymond Shaw** is a co-PI on this potential three-year project.

Professor Ramy El-Ganainy is the PI on a project that has received a \$107,875 research and development grant from Pennsylvania State University. The project is titled “Programmable Systems with Non-Hermitian Quantum Dynamics.” This potential five-year project could total \$599,875.

Professor Emeritus David Nitz is the PI on a project that has received a \$249,804 research and development grant from the NSF. This three-year project is titled “WoU-MMA: Enhancing the Neutrino Sensitivity of the Pierre Auger Observatory.” The observatory is used by researchers from across the world to study high-energy cosmic rays—particles that can travel through space at speeds approaching the speed of light.

Professor Alex Kostinski is the PI on a project that has received a \$96,230 research and development contract from Lawrence Livermore Natl. Laboratory. The project is titled “Theoretical Support for Gas-Gun Experiments: Towards Suppression of Shockwave Instabilities and Jetting.”

Professor Ravindra Pandey is the PI on a project that has received a \$20,784 research and development contract-cost from Lawrence Livermore Natl. Laboratory. This three-month project is titled “Computational Assessment of Chlorine Attack on the Surface of Aluminum Oxide.”

AWARDS AND ACHIEVEMENTS

A paper authored by **Assistant Professor Kartik Iyer** was cited in the scientific background on the Nobel Prize in Physics 2021, awarded to Syukuro Manabe, Klaus Hasselmann, and Giorgio Parisi for “groundbreaking contributions to our understanding of complex systems” in work modeling our climate and predicting the course of global warming. Iyer’s paper, “Classical 1/3 scaling of convection holds up to $Ra = 10^{15}$,” was published in the *Proceedings of the National Academy of Sciences* in 2020.

Professor Robert Nemiroff and colleague Jerry Bonnell of Goddard Space Flight Center won the International Astronomical Union’s inaugural Astronomy Education, Outreach and Development Prize for Outreach. Since 1995, the Astronomy Picture of the Day has been one of the premier sources for access to and information about our vast universe.

Professor Bryan Suits has finished his second textbook, *Physics Behind Music*, based on his course of the same name. The book, published in hardcopy and electronic formats by Cambridge University Press, is expected to be generally available in late spring 2023.

Professor Ravindra Pandey was invited and delivered a special seminar on interface driver properties of 2D materials at the Institute of Nano Science and Technology Mohali in India in March 2022.

Professor John Jaszczak, director of the A. E. Seaman Mineral Museum, was named the inaugural appointee to a newly endowed curator position. The John and Phyllis Seaman Endowment for Curation of the A. E. Seaman Mineral Museum will provide perpetual support for a museum curator. Jaszczak holds the responsibilities of caring for, growing, and utilizing the museum’s collections of minerals and related objects for exhibit, education, and research.

Professor Ramy El-Ganainy was promoted to the rank of professor.

We welcomed **Teaching Professor Michael Meyer** back to the department. From 2011 to 2022, he served as the director of the Center for Teaching and Learning (CTL) and will continue to work with the CTL on faculty development.

Professor Yoke Khin Yap was selected by Dean David Hemmer of the College of Sciences and Arts as a member of the 2022 Deans’ Teaching Showcase. Yap was recognized as one of 13 honorees at a spring 2022 luncheon, and was also a candidate for the CTL Instructional Award Series.

A paper by **Professor Ramy El-Ganainy** and PhD candidate **Amin Hashemi** was published in *Nature Communications* in June; the paper digs deeper into the features of non-Hermitian systems.

Budget Coordinator/Office Manager Claire Wiitanen was recognized in the Above and Beyond category in the Staff Council’s Making a Difference Staff Awards.

Professor John Jaszczak (30 years) and **Budget Coordinator/Office Manager Claire Wiitanen** (five years) were recognized for their years of service at the 2022 University Staff Service awards.

Graduate student **Justin Cassell** was awarded the GEM Associate Fellowship to support under-represented candidates pursuing science and engineering degrees. **Sandip Aryal**, **Andrew Puyleart**, and **Geeta Sachdeva** received Finishing Fellowships from the Graduate School, and Henes Center Fellowship awards were made to **Aryal**, **Nurun Nahar Lata**, and **Sachdeva**.

Several graduate students furthered their educations away from Michigan Tech: **Lisa Eggert** interned at Lawrence Livermore Natl. Lab, **Susan Mathai** and **Abu Sayeed Shawon** interned at Pacific Northwest Natl. Lab, and **Geeta Sachdeva** interned at Los Alamos Nat’l Lab. **Cameron Shock** received a U.S. Department of Energy fellowship to work at Sandia Natl. Lab, **Lucas Simonson** was awarded a DAAD scholarship to study at the Max Planck Institute for the Physics of Complex Systems, and **Meera Boora** was selected as a 2DCC resident scholar visitor at Penn State.

Sandip Aryal, **Nurun Nahar Lata**, **Abu Sayeed Md Shawon**, and **Andrew Puyleart** received the Graduate School Outstanding Scholarship Award, while **Ian Herzog** and **Oindabi Mukherjee** received the Outstanding Student Teaching Award. **Jeff Kabel** received an Outstanding Service Award and **Rishi Babu** and **Aleister Kerr** received recognition from Provost Jacqueline Huntoon for their exceptional student evaluation scores for the 2021 fall semester.

Lisa Eggart was named Exceptional Student Leader at the 2022 Graduate Student Government Awards.

Rishi Babu won first place in a competition in which 49 graduate students gave oral presentations. His presentation was titled “Study of a source rich region to understand the origin of PeVatrons.”

The annual departmental graduate research colloquia, presented in a hybrid format, took place January-April 2022, with **Dharmendra Pant** receiving the peer-voted oral presentation award. The April 2022 research posters were presented in person, with **Aaron Wildenborg** receiving the poster presentation award.

Trevor Kieft was the recipient of the Ian Shepherd Award for outstanding senior undergraduate students, presented by alumnus Robert Niffenegger, a professor at University of Massachusetts Amherst. Kieft was also first author on “A filter-based Raman spectrometer for non-invasive imaging of atmospheric water vapor,” published in March 2022 in *Review of Scientific Instruments*. The paper was co-authored by alumnus Carter Mashburn ’21 and **Professors Jacek Borysow and Claudio Mazzoleni**.

Bethany Hellman and **(Erin) Casey Aldrich** were the recipients of the inaugural Elizabeth Henes Award to the most outstanding graduating woman in physics, presented by alumnus Robert Niffenegger.

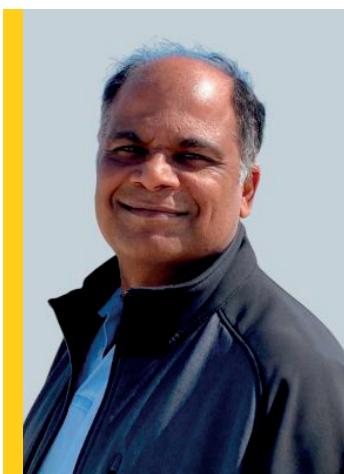
Alex Gonzalez was named our 2022 Physics Departmental Scholar and nominated for the Provost’s Award for Scholarship.

ALUMNI SPOTLIGHT



Steven Rehse '94 is a professor of physics and department head at the University of Windsor, Windsor, Ontario, Canada. After receiving a BS from Michigan Tech, Rehse went to graduate school at Colorado State University, Fort Collins, obtaining a PhD in 2002. Prior to

accepting the position at the University of Windsor, he was a faculty member in the Department of Physics and Astronomy at Wayne State University, Detroit. Rehse has been working at the forefront of the field of laser spectroscopy, focusing on biomedical applications and laboratory astrophysics measurements. He has published 60+ papers in peer-reviewed journals and has mentored dozens of undergraduate and graduate students at both Wayne State and Windsor. His recent work involves the rapid diagnosis of bacterial pathogens using laser-induced breakdown spectroscopy. Rehse has been married to his wife Genevieve Isshak for 19 years and lives in LaSalle, Ontario, Canada.



Srirama (Sri) S. Venkataraman '98 is the chief innovation officer at Promaxo Inc. He was a graduate research fellow receiving a PhD under the supervision of Professor Bryan Suits. His research work was focused on magnetic resonance (MR) imaging of materials with large quadrupolar interaction. After graduating, Venkataraman completed postdoctoral fellowships at Fox Chase Cancer Center,

Philadelphia, Pennsylvania, and Mayo Clinic, Rochester, Minnesota, on MR spectroscopy and vascular imaging, respectively. He then joined Philips Healthcare, spending the next 17 years of his professional career in various roles, from MR clinical science to the Chief Strategy and Innovations Office.

Between 2004 and 2008, Venkataraman served as adjunct faculty at the Department of Radiology at Columbia University, New York, developing novel MRI techniques for neurological applications. In 2009, he obtained his MBA from Rutgers Business School in New Brunswick, New Jersey. In 2017, he joined Stryker Corporation as a business partner for global R&D and digital platform services. In 2020,

he joined Promaxo, a late-stage medical device and robotics company specializing in point-of-care MRI-guided prostate interventions.

While not working, Venkataraman enjoys spending time with his family, long walks in his beautiful neighborhood, cooking, traveling, and reading. He is also a CEO and co-founder of Santé Value, an early-stage health data brokering start-up specializing in curated, ready-to-use data and smart AI-based algorithms for medical devices and pharmaceutical and life sciences companies

SENIOR TRIP

In May 2022, 10 senior undergraduates accompanied by **Associate Teaching Professor Katrina Black** traveled to Paris, France. The focus of the trip was a tour of the Laboratories for Optics and Biosciences at Ecole Polytechnique in Palaiseau, where students saw how cutting-edge 3D microscopy techniques are being developed by physicists and used by biologists to study cellular development. They also experienced an array of cultural touchstones, including visits to the Marie Curie Museum, the Louvre, and the Palace of Versailles.



Outside Marie Curie's laboratory at the Radium Institute. **Back row, from left:** Wyatt Reller, Trevor Kieft, Marc Fritts, Dalton Knight, Riley Dickert. **Front row, from left:** Sarah Huffman, Kaz Zeiter, Bethany Hellman, Casey Aldrich, Daniel Koshar.

GRADUATE SPOTLIGHT



Tong Gao is a PhD candidate working with Associate Professor Issei Nakamura. She joined Michigan Tech in fall 2017. Her research focuses on studying lithium dendrite growth in electrolytes using Monte Carlo simulations and deep neural networks in machine-learning methods. Gao discovered a new mechanism for inhibiting the dendrite growth with large organic salts, such as ionic liquids. Other than dendrite inhibition, she has worked

with Amalie Frischknecht and Mark Stevens at Sandia Natl. Laboratories to develop computationally fast surrogate models of Stockmayer fluid molecular dynamics simulations for determining the dielectric constants of salt-free and salt-doped solvents. As she approaches the end of her PhD program, Gao is developing unsupervised learning models to predict ternary phase behaviors of cellulose and ionic liquid mixtures. Her tenacity in research and enthusiasm for soft-matter physics has led to four peer-reviewed professional journal articles.

Gao received the Doctoral Finishing Fellowship in summer 2022 and the Henes Center Fellowship for spring and fall 2022. In addition to her research duties, she has served as president of Women in Physics in support of women and gender minorities in STEM fields, especially the physical sciences. She has also served as the president of the Chinese Students & Scholars Association.

SENIOR SPOTLIGHT



Alex Gonzalez is a senior physics major who transferred to Michigan Tech after spending a summer working with Professor John Jaszczak to investigate surface structures in graphite crystals, processing samples and imaging them using optical, atomic force, and STE microscopy. His senior research with Dr. Claudio Mazzoleni focuses on the development of photoacoustic methods to measure absorption coefficients of aerosols.

While a student at Tech, Gonzalez has been a member of the Society of Physics Students on the Applications Committee, and was named the 2022 Physics Departmental Scholar. In his free time, he enjoys playing logistics management video games and reading science fiction and fantasy. Following graduation, Gonzalez plans to move to the Pacific Northwest to pursue graduate studies or a career in the aerospace industry.

GRADUATE SPOTLIGHT



Neerav Kaushal is a PhD candidate working with Assistant Professor Elena Giusarma. He joined Michigan Tech in fall 2018 as an MS student and started his PhD in fall 2019 in machine-learning-driven computational astrophysics. His research focuses on developing novel, fast, reliable, and precise field-level neural network emulators for structure formation in the universe. The universe evolved from a nearly uniform

matter distribution to its present complicated state called the cosmic web. In order to compare the experimental observations of the large-scale structure of the universe with theory, faster methods to generate cosmological simulations are needed, and deep learning plays a pivotal role in that.

Neerav received accolades for his research, including first prize for his 2021 Graduate Research Colloquium oral presentation and first prize for his 2020 Physics poster presentation. He recently published a single-author paper in the reputed *Astrophysical Journal* discussing a novel algorithm to reconstruct the trajectories of muons in Cherenkov detectors (doi.org/10.3847/1538-4357/ac8798). He also gave presentations at the 240th American Astronomical Society Meeting in 2022, the Machine Learning X Cosmology conference in 2021, and the reputed Neural Information Processing Systems conference in 2021.

Neerav will join Radial Therapeutics Inc., a Flagship Pioneering company in Boston, next year as an AI scientist. He will conduct AI-driven research to address impactful and challenging problems in drug discovery, healthcare, and sustainability.

STAFF SPOTLIGHT



Administrative Aide/Graduate Student Coordinator Megan Johnson joined the physics department in April 2022. Johnson has been working at Michigan Tech since October 2018. She was a part of the Concur implementation team in Financial Services and Operations, and served as administrative support to the Business Support Center, which services all of the auxiliary departments across campus.

Johnson graduated from Northern Michigan University in 2000 with an associate's degree in office information systems. Prior to working for Michigan Tech, she was a property manager for a local real estate and development company.

▶ THANK YOU!

We extend our deepest appreciation to our friends and alumni who have made recent gifts or pledges to Michigan Tech. Did we miss your contribution? If so, please contact physics@mtu.edu. As always, we appreciate your continued interest in the Department of Physics at Michigan Technological University.

Edward Augustyniak '94
& Monika Sujczynska

Ramakrishnan Bashyam '96
& Harini Sampathkumar

Marylin A. Beck

Theodore L. Bedore '72

John '69 & Louise Bretney

Ziyong Cai '88 & Ping Zhou

James F. Capizzo '76

Russell '63 & Joan Compton

Konstantin '95 & Dessy Dinov

Eugenia & John '50 (dec.) Evans

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Walter '64 & Margaret Kauppila

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James '66 & Kathleen Kortge

Jack '62 & Kaethe Labo

Jason A. LaCosse '95

Edward M. Leonard '12

Miguel & Anita Levy

Ronald '56 & Judith (dec.) McKee

Paul '71 & Joanne Michaels

James '65 & Joan Mitchell

Mitchell Intellectual Property Law

Thomas '76 & Margaret Mohr

Jeffrey '84 & Suzanne Morris

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Dale '68 & Lauren Mukavetz

David Nitz & Mary Marchaterre

Brenda & Samuel '63 (dec.)
Ochodnický

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Manuj Rathor '96 & Shweta Singh

Mary J. Repar '75

Carly B. Robinson '07

Joseph '70 & Susan Rowe

Suresh K. Sampath '98

Mary Ann & Maximilian (dec.) Seel

Thomas & Sharon Silvis

Gilbert '48 & Sonia (dec.) Sloan

Richard '63 & Mary Ann Spigarelli

James '63 & Janice Strahl

Steven L. Tomsovic '80

C. John '64 & Kathryn Umbarger

Roger '66 & Linda Urbaniak

SriramaSwaminat Venkataraman '98
& Kalpana Chandrasekharan

David E. Woon '84

William E. Wuerthele '66

Min Yan '88

Charles '66 & Mary Zeigler

Ziyou Zhou '09 & Xiaoyue Huang '07

▶ OUTREACH

The student group **Women in Physics** reached out to the next generation of scientists and inspired women to pursue physics as their career choice. They organized activities for high school students at Gwinn High School, presenting their research and providing activities on physics principles—from friction and angular momentum to optics and magnetism.

Oindabi Mukherjee presented a video animation featuring NASA's Astronomy Picture of the Day, **Tong Gao** talked about the next generation of lithium-ion batteries, and **Elise Rosky** described her experience of collecting aerosol samples from an airplane.



Elise Rosky demonstrates refraction to students at Gwinn High School.

MICHIGAN TECH DISTINGUISHED PROFESSOR



Distinguished Professor Petra Huentemeyer was chosen to join the ranks of Michigan Tech's distinguished professors in April 2022. This title recognizes the achievements of Michigan Tech's most outstanding faculty members who have made substantial contributions to the University and their discipline.

Huentemeyer's background is in astrophysics and elementary particle physics. She is currently interested in the study of gamma and cosmic rays to solve the century-old puzzle of the origin of galactic cosmic rays, first detected by the Austrian-American scientist Victor Hess in 1912.

Gamma rays are produced by cosmic ray interactions with matter and radiation fields in space, and as neutral particles, they can be traced back to their origin. The high-energy processes by which they are produced can be studied by measuring their energy spectra, source morphologies, and the spatial correlation of their sources with sources at other wavelengths.

Previously, Huentemeyer was a member of the OPAL collaboration at CERN and later joined the HiRes and Milagro experiments. Most recently, she has been involved in the analysis of Milagro data and the design and construction of the HAWC Observatory on the Sierra Negra plateau near Puebla, Mexico.

TRENDING

NASA's Astronomy Picture of the Day (APOD), co-founded by **Professor Robert Nemiroff**, was trending on TikTok in March, with users pairing the APOD featured on their birthday with music they picked out. Over 43,000 videos were posted using APOD images, receiving over 3.9 million views.

DEGREE RECIPIENTS

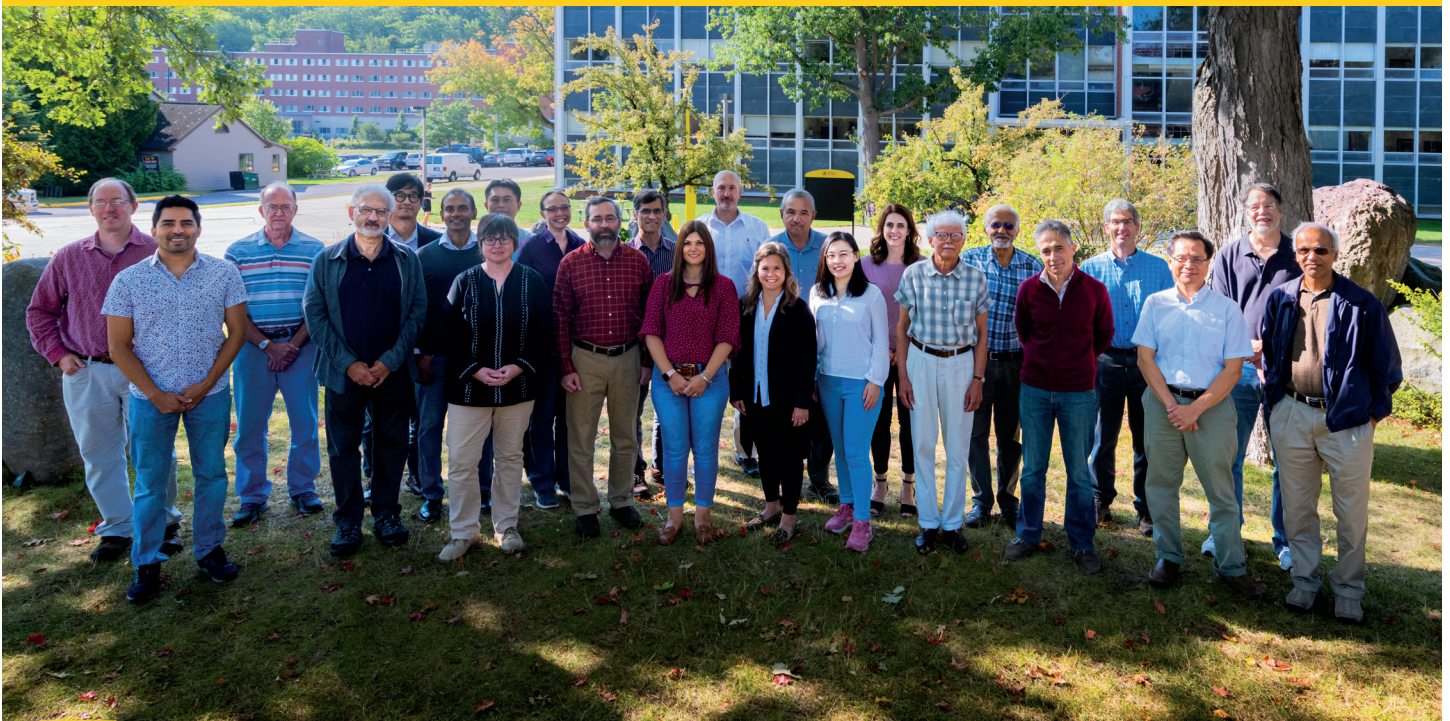
STUDENT	DESTINATION
Sandip Aryal, PhD	Postdoc, Wayne State
Nurun Nahar Lata, PhD	Postdoc, Pacific NW Natl. Lab
Andrew Puyleart, PhD	Postdoc, Pacific NW Natl. Lab
Abu Sayeed Md Shawon, PhD	Postdoc, Los Alamos Natl. Lab
Subin Thomas, PhD	Climate Hazard Modeler, RMS, London, UK
Alex Buiciuc, MS	–
Samuel Groetsch, MS	PhD, Michigan Tech
Amin Hashemi, MS	PhD, University of Central Florida
Ian Herzog, MS	PhD, Michigan State
Zackerie Hjorth, MS	–
Sonali Mohan, MS	–
Megan Morgenstern, MS	–
Seyedmostafa Rezaeitaleshmahalleh, MS	PhD (Biomedical Eng.), Michigan Tech
Elise Rosky, MS	PhD, Michigan Tech
Rhiannon Turner, MS	PhD, Michigan Tech
Aaron Wildenborg, MS	PhD, Michigan Tech
Ezra Cotter, BA	MBA, Michigan Tech
Marc Fritts, BS	–
Bethany Hellman, BS	PhD, University of Central Florida
Sarah Huffman, BS	–
Trevor Kieft, BS	PhD, JILA, University of Colorado
Dalton Knight, BS	MS, Eastern Michigan
Alan Larson, BS	MS, Michigan Tech
Anthony Palmer, BS	US Naval Officer
Renato Pinto Reveggino, BS	Intern, Pacific Northwest Natl. Lab
Marco Pozza, BS	US Air Force Officer
Wyatt Reller, BS	Seagate Technologies
Kaz Zeiter, BA	Study Abroad, Cumbria



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Members of the physics department gather on a beautiful fall day. **Front row, from left:** Mauricio Reyes Hurtado, Miguel Levy, Petra Huentemeyer, Nathan Black, Elena Guisarma, Claire Wiitanen, Xiaojie Wang, Jacek Borysow, Claudio Mazzoleni, Yoke Khin Yap, Ranjit Pati. **Back row, from left:** Will Cantrell, Robert Weidman, Jae Yong Suh, Kartik Iyer, Issei Nakamura, Katrina Black, John Jaszczak, Wil Slough, Alex Kostinski, Megan Johnson, Ravindra Pandey, Michael Meyer, Robert Nemiroff. **Not pictured:** Ramy El-Ganainy, Brian Fick, Raymond Shaw, Amanda Shaw, Bryan Suits, Ian Helman, Jesse Nordeng.