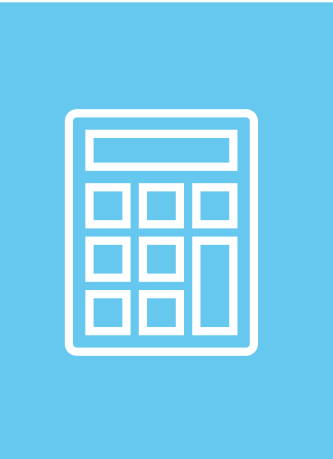


COLLEGE OF NATURAL SCIENCES  
AND MATHEMATICS

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THE UNIVERSITY OF TOLEDO

**2022 ANNUAL REPORT**





## Doermann Distinguished Lecture

This free public lecture was held on Wednesday, April 6, 2022, hosted by the College of Natural Sciences and Mathematics at Nitschke Auditorium.



### “What’s Love Got to Do With It? Lessons from Detroit’s Kids”

**Guest lecturer: Dr. Steven Kahn**, Professor, Department of Mathematics and Director, Center for Excellence & Equity in Mathematics, Wayne State University (WSU); CEO and co-founder of Math Corps

Dr. Kahn co-founded Math Corps in 1992, at WSU, as a summer camp for middle school students who could benefit from mentoring & positive influences. The primary goal for the camp was to support the emotional & social needs of the students in Detroit. Since its inception, Math Corps has expanded to more than a half dozen other locations - most recently, UToledo! (Read more about Math Corps UToledo on page 7.)

*Pictured (L-R): Dr. Steven Kahn, Dr. Funda Gultepe and Dr. Marc Seigar.*

### Congratulations to the NSM faculty and staff who were recognized with awards or distinctions by The University of Toledo during the 2021-2022 academic year:

- Dr. Tomer Avidor-Reiss, professor, Department of Biological Sciences, a recipient of the Creative and Scholarly Activity Award;
- Dr. Jillian Bornak, associate lecturer, Department of Physics and Astronomy bestowed with the honorary title of Distinguished University Lecturer;
- Dr. Rupali Chandar, professor, Department of Physics and Astronomy, a recipient of the Outstanding Research and Scholarship Award;
- Beth Denzel, Department of Biological Sciences, a recipient of the Outstanding Advisor Award;
- Dr. Rafael Garcia-Mata, associate professor, Department of Biological Sciences, a recipient of the Creative and Scholarly Activity Award;
- Kevin Gibbs, senior lecturer, Department of Mathematics and Statistics, a recipient of the Outstanding Teacher Award;
- Dr. Emanuela Gionfriddo, assistant professor, Department of Chemistry and Biochemistry, a recipient of the Creative and Scholarly Activity Award;
- Dr. Thomas Megeath, professor, Department of Physics and Astronomy, bestowed with the honorary title of Distinguished University Professor;
- Dr. Kathy Shan, lecturer, Department of Physics and Astronomy, a recipient of the Outstanding Teacher Award;
- Dr. Yanfa Yan, professor, Department of Physics and Astronomy, a recipient of the Creative and Scholarly Activity Award.

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### We're social - follow us!



## COLLEGE OF NATURAL SCIENCES & MATHEMATICS

Dean **Marc Seigar**  
Associate Dean **John Plenefisch**  
Associate Dean **Brian Ashburner**  
Executive Assistant to the Dean **Rita Yunker**  
Senior Business Manager **Jamie Fager**  
Marketing, Communications, Recruitment **Gayle Heer**

### DEPARTMENT CHAIRS

Biological Sciences **John Plenefisch**  
Chemistry and Biochemistry **Jon Kirchhoff**  
Environmental Sciences **Jonathan Bossenbroek**  
Mathematics and Statistics **Geoffrrey Martin**  
Physics and Astronomy **Sanjay Khare**

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 LETTER FROM  
**THE DEAN**

**MARC SEIGAR**


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Dear Friends of UToledo's College of Natural Sciences and Mathematics,

We are thrilled to present the inaugural College of Natural Sciences and Mathematics (NSM) report for the 2021-22 academic year. This was an incredible year for NSM as we went back to in-person instruction and our faculty brought in a record level of research grants. Not only that, but we also had a record year for fundraising and development.

This was my first year as Dean of NSM and I spent a good part of this year meeting and getting to know our faculty, students, alumni and partners. I feel honored to lead such a strong college with faculty who are world renowned in their fields and excellent mentors to their students.

We have had several great successes in the last year. Four of our faculty received CAREER awards from the National Science Foundation (NSF). NSF's CAREER award is one of the most prestigious grants that a young faculty member can win. Congratulations to Qian Chen (Department of Biological Sciences), Emanuela Gionfriddo, Mike Young and Matthew Wohlever (all from the Department of Chemistry and Biochemistry). While I cannot report on the total grants brought in for the 2021-22 fiscal year (which does not close until September), the previous fiscal year NSM faculty secured \$24.7 million of extramural grants, a record for NSM, and a record for a single college at UToledo. As you can see, our faculty are taking NSM from strength to strength. Another record we had this year involves fundraising, where we brought in over \$3 million! Thank you to the UToledo Foundation team: Allie Berns, Nick Butler and Amanda Caig, for all their help in fundraising and donor and alumni engagement.

I am also pleased to report that NSM secured nearly \$2.3 million for the ODNR H2Ohio program to develop a wetland research park on the CADE (Center for Alumni and Donor Engagement) property. We are working with an ecological restoration company scheduled to break ground in the Spring of 2023. We are aspiring to secure extra funding to build boardwalks, a viewing pavilion and a teaching/research building at the facility. This new wetland research park will help us bring in community and K-12 school groups so we can spread the word about all the work UToledo is doing in the area of water quality.

Speaking of water quality, the UToledo Lake Erie Center (LEC) dedicated its new boat to the memory of Dave Spangler. A special thank you to the Women in Philanthropy at UToledo, without whom the purchase of this research vessel (the R/V Spangler) would not have been possible. Additionally, Dr. Christine Mayer's Lab, also at the UToledo LEC, opened a new barn that houses the boats she and her team use to catch grass carp (an invasive species) in the Maumee River.

In terms of student success, the Student Experience Project (SEP) is in full swing in NSM. The SEP Equity Champions project began at UToledo in Summer 2020 and since its inception, NSM has had 23 faculty/researchers who have participated in the project as equity champions. Our very own Associate Dean Dr. Brian Ashburner is part of the UToledo SEP Leadership Team. This project promotes equity and a sense of belonging to students from historically underrepresented groups in the STEM fields. Through this and other efforts our retention of first-year students was at 80.1% this last year, even though we were still in the middle of an ongoing pandemic. This just shows how dedicated our faculty and staff are in NSM!

Finally, to all our friends, I ask that you stay in contact, stop by when you can and send us any information you would like to share about your career, research achievements and other exciting news.

Best Regards and Go Rockets!

Marc Seigar, Ph.D.  
Dean, UToledo College of Natural Sciences and Mathematics



Pictured (L-R): Gayle Heer, Rita Yunker, Dr. Brian Ashburner, Dr. John Plenefisch, Dr. Marc Seigar and Jamie Fager.



## DEPARTMENT OF BIOLOGICAL SCIENCES

Acting Chair, Dr. John Plenefisch

The Department of Biological Sciences saw 108 undergraduate and 10 graduate students complete their degrees in the 2021-22 academic year!

Select highlights from the year include:

### Research publications featuring both undergraduate and graduate students in conjunction with their faculty mentors!

- Erin N. Hunt (B.S. Biology, '22), Jonathan P. Kopacz (undergraduate) and Dr. Deborah J. Vestal had a publication in the journal *Cancers* titled, "Unraveling the Role of Guanylate-Binding Proteins (GBPs) in Breast Cancer: A Comprehensive Literature Review and New Data on Prognosis in Breast Cancer Subtypes". [doi.org/10.3390/cancers14112794](https://doi.org/10.3390/cancers14112794)
- Dr. Heather Conti and the Conti Lab (undergraduate students: Maura Hickey, Elise Mein-Chiain Yi and Yusuf Daboul and graduate students: John Dillon, Dylan Launder and Priosmita Biswas) published, "Radiation Exposure Perturbs IL-17RA-Mediated Immunity Leading to Changes in Neutrophil Responses That Increase Susceptibility to Oropharyngeal Candidiasis" in *Journal of Fungi*. [doi.org/10.3390/jof8050495](https://doi.org/10.3390/jof8050495).
- First author Ankit Jaiswal (Ph.D. student), Tatiana Baliu-Souza (undergraduate student), Katerina Turner (Ph.D. student), Dr. Tomer Avidor-Reiss, et al., had a publication in *European Journal of Cell Biology* titled, "Sperm centriole assessment identifies male factor infertility in couples with unexplained infertility – a pilot study". [doi.org/10.1016/j.ejcb.2022.151243](https://doi.org/10.1016/j.ejcb.2022.151243)

### Awards and recognitions received by undergraduate and graduate students!

- Tarak Davuluri, undergraduate student (Garcia-Mata Lab), was awarded a National Institute of General Medical

Sciences (NIGMS) supplement to complete undergraduate research in the summer. These funds are awarded to support undergraduate students who are considering pursuing biomedical research careers by providing authentic research experiences in cutting-edge scientific environments.

- Derek Kluczynski, undergraduate student (Avidor-Reiss Lab), took second place in The University of Toledo Office of Undergraduate Research and the UToledo Carlson Library annual Undergraduate Research and Creative Activity Exhibition with his project titled, "Sperm Centriole Defects May be Associated with Male Subfertility".
- Graduate students Kadry Elkalawozgy (Chen Lab) and Luis Cedenno-Rosario (Chadee Lab) were recognized as Department of Biological Sciences Outstanding TAs for 2021-22.

### New research grant awards were received by departmental faculty researchers!

- Dr. Qian Chen received an award of \$1.6 million for his National Institutes of Health (NIH) RO1 funded project titled, 'The mechanism of cell size regulation by polycystin'. In addition, Dr. Chen received a prestigious NSF CAREER Award for his project, "CAREER: The Regulation of Cytokinesis by Calcium". This five-year project, funded for \$700,904, began January 1, 2022. This is a rare combination of awards and is an amazing achievement!
- Dr. Scott Crawley received an award of \$449,218 for his National Institutes of Health (NIH) R15 funded project, "CDHR5 tumor suppressor function in the intestine". The project was awarded for three years (09.01.2021 to 08.31.2024)!

### 2022 Department Outstanding Graduating Student Jacob Kahle



**Jacob's research and presentation were superb and contributed to his excelling in the lab. He made vital observations that allowed me to continue this project with a graduate student. Moreover, this project was going so successfully, it led to a scientific publication with Jacob's name as a coauthor which is his great achievement as an undergraduate student." - Professor Maria Diakonova**

Jacob's meritorious activities include Undergraduate Researcher as well as co-author on a research publication (2022), Development Coordinator for Camp Kesem at UToledo, Rocket to Rocket Pre-Health Mentor, Emergency Medical Technician in Putnam County, CPR Instructor for American Heart Association, Tutor through Humanity First at UToledo, Kalida Lions Club Member and Kalida Boy Scouts. Jacob graduated Magna Cum Laude.

Photo above (L-R):

Dean Marc Seigar, Jacob Kahle and Dr. John Plenefisch.

*Thank you to Dr. John Plenefisch for serving as Acting Chair for the '21-22 AY. We are very appreciative of his hard work in filling this role in addition to that of Associate Dean. Effective July 1, 2022, Dr. Song-Tao Liu will be serving in the role of Department Chair. We wish him great success!*

## DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Chair, Dr. Jon Kirchoff

The Department of Chemistry & Biochemistry saw 23 undergraduate and 9 graduate students complete their degrees in the 2021-22 academic year!

Select highlights from the year include:

Dr. Amy Toole, Dr. Kristi Mock and graduate student Noah Peterson were recognized by the Office of the Provost as being educators who have positively impacted their students well-being, success or sense of community on campus during the fall 2021 semester through the “Shout Out” to Innovative Instructors and Staff campaign!

### Awards and recognitions received by undergraduate and graduate students!

- Ronald Emmons (Ph.D. student, Gionfriddo Lab) was awarded a 2022 ACS Division of Analytical Chemistry (DAC) Summer Graduate Fellowship, sponsored by Pittcon, in the amount of \$7,000! DAC Graduate Fellowships are very prestigious and recognize only a few of the top analytical graduate students in the country each year.
  - Abigail Olomukoro (Ph.D. student, Gionfriddo Lab) received an ACS Division of Analytical Chemistry Younger Chemists Conference Travel Grant for \$1,000 to support her travel and presentation at the American Society for Mass Spectrometry conference in Minneapolis, MN, June 2022.
  - Vinod Landge (post-doc, Young Lab) was an inaugural recipient of the Nina McClelland Memorial Award for excellence in green chemistry research by a postdoctoral scholar. The award from the ACS Green Chemistry Institute of \$2,000 allowed Vinod to attend and present his research at the Green Chemistry and Engineering Conference in Reston, VA, June 2022.
  - Navdeep Kaur (Ph.D. candidate, Li Lab) received a 2021-2022 GSA Research Award of \$2,000 for her doctoral dissertation.
- It was an amazing year for new research grant awards by our departmental faculty researchers!**
- Dr. Michael Young received a prestigious NSF CAREER Award for his project, “CAREER: Expanding the Toolbox for Olefin Functionalization and Difunctionalization Reactions”. The five-year award begins August 1, 2021 and totals \$648,553. Young’s is the 7<sup>th</sup> CAREER Award received by a faculty member in Chemistry & Biochemistry at UToledo!
  - Dr. Matthew Wohlever also received a prestigious NSF CAREER Award for his project, “CAREER: The Effects of Liquid-Liquid Phase Separation on Ubiquilin Chaperone and Triage Activity”. The five-year project, funded for \$1,088,389, will begin December 1, 2021 and run through November 30, 2026. Wohlever’s is the 8<sup>th</sup> NSF CAREER Award received by a faculty member in Chemistry & Biochemistry at UToledo! In addition, Dr. Wohlever received a supplemental equipment award of \$176,765 for his NIH grant, titled “Mechanistic Investigation of Proteostasis at the Outer Mitochondrial Membrane”, to obtain a Mosquito LCP Robot.
  - Dr. Emanuela Gionfriddo was also a recipient of the prestigious NSF CAREER Award for her project: “CAREER: Understanding Molecular Mechanisms Underlying Chemical Behavior of Pollutants in Heterogeneous Environmental Systems”. This five-year project, funded for \$756,354, begins April 1, 2022. Gionfriddo’s is the 9<sup>th</sup> CAREER Award received by a faculty member in Chemistry & Biochemistry at UToledo. In addition, Dr. Gionfriddo received the 2022 Satinder Ahuja Award for Young Investigator in Separation Science!
  - Dr. Mark Mason received an award extension for an additional \$437,113 on a contract for an aerospace project that is a collaboration with the College of Engineering.

### 2022 Department Outstanding Graduating Student Elizabeth Ziegelmeier



**Beth always provides high quality research reports that exceed the level expected by an undergraduate researcher. Her passion for environmental chemistry has made her a perfect fit for my lab and the Dr. Nina McClelland Laboratory for Water Chemistry and Environmental Analysis. I am certain she will succeed in any career she will choose in the future.”**  
- Assistant Professor Emanuela Gionfriddo

Beth’s meritorious activities include Undergraduate Researcher as well as co-author on three research publications (2020-21), ACS UToledo Chapter Past-Secretary and Current Vice President, Clean Water for the World UToledo Inaugural President, CHEM 1200 Peer Leader, Honors College Ambassador, Intern at Avient in Avon, OH (2019) and Intern at the R. J. Marshall Company QC laboratory in Rockwood, MI (2022). Beth graduated Summa Cum Laude.

Photo above (L-R):

Dean Marc Seigar, Elizabeth (Beth) Ziegelmeier and Dr. Emanuela Gionfriddo.



## DEPARTMENT OF ENVIRONMENTAL SCIENCES

Chair, Dr. Jon Bossenbroek

The Department of Environmental Sciences saw 36 undergraduate and 10 graduate students complete their degrees in the 2021-22 academic year!

Select highlights from the year include:

UToledo alum Randy Thomas (B.S. Environmental Sciences, '19) delivered an inspirational address at UToledo's undergraduate commencement ceremony on Saturday, May 7, 2022. Randy competed in Discovery's first-ever shark series, Shark Academy, during Shark Week 2021 on discovery+. Randy was the top competitor and won the coveted crew spot on Dr. Riley Elliot's research team!

### Research publications featuring both undergraduate and graduate students in conjunction with their faculty mentors!

- Dr. Kennedy Doro, Amar Kolapkar (B.S. Geology, '22), et al. published research that confirms the potential use of geoelectrical methods in search for hidden graves, "Geophysical imaging of buried human remains in simulated mass and single graves: Experiment design and results from pre-burial to six months after burial", in *Forensic Science International*. [doi.org/10.1016/j.forsciint.2022.111289](https://doi.org/10.1016/j.forsciint.2022.111289)
- Dr. William Hintz published a highly accessed and cited study in *Frontiers in Ecology and the Environment* discussing issues and solutions surrounding the use of road deicing salts, "Road salts, human safety, and the rising salinity of our fresh waters". [doi.org/10.1002/fee.2433](https://doi.org/10.1002/fee.2433)
- Dr. Jeanine Refsnider, Jessica Garcia (M.S., '19), Brittany Holliker (B.S., '20), Austin Hulbert (M.S., '20), Ashley Nunez and Dr. Henry Streby published the article "Effects of harmful algal blooms on stress levels and immune functioning in wetland-associated songbirds and reptiles", in *Science of the Total Environment*. [doi.org/10.1016/j.scitotenv.2021.147790](https://doi.org/10.1016/j.scitotenv.2021.147790)

### Awards and recognitions received by undergraduate and graduate students!

- Amar Kolapkar (B.S. Geology, '22), undergraduate student (Doro Lab), was awarded a scholarship of \$447.51 from the Society of Exploration Geophysicist for the 2021-2022 (Aug/Sep 2021 to July 2022) academic year!
- Kaitlen Lang (M.S. Ecology, '22) was selected as one of the 74 finalists for the 2022 John A. Knauss Marine Policy Fellowship program and became part of the 43<sup>rd</sup> class of one of the most prestigious marine policy fellowships in the U.S.! Kaitlen joined the National Oceanic and Atmospheric Administration (NOAA) Research branch as an Ocean Decade Policy Assistant in the Office of the Assistant Administrator. Kaitlen is working to further the United States' involvement in the United Nations Ocean Decade, a global framework for sustainably managing the world's oceans.
- Moses Adebayo, M.S. student in geology (Doro Lab), received an award from the SEG/AGIP and the SEG Foundation Scholarships for a total of \$3,000 for the 2022-2023 AY. Moses' research focuses on understanding subsurface flow and solute redistribution in floodplains within Terrestrial and Aquatic Interfaces.
- Silas Fischer, Ph.D. candidate in ecology (Streby Lab), received an award of \$2,500 from Out to Innovate! This award will support Silas' research studying desert songbird responses to climate change, specifically 2022 fieldwork on Gray Vireos in New Mexico. In addition, Silas received a 2021-2022 GSA Research Award of \$1,900 for their doctoral dissertation.
- Maureen Casaus (Fisher Lab) received a 2021-2022 GSA Research Award of \$2,000 for her masters thesis.
- Paige Madden (Refsnider Lab) received a 2021-2022 GSA Research Award of \$1,985 for her masters thesis.

### 2022 Department Outstanding Graduating Student Lee Harms



**My courses involve a great deal of group-work and I have witnessed Lee's interaction with his classmates in two courses. I can attest that Lee embodies the qualities of a leader. He is organized, intelligent, fair and an asset to every group he joins. Beyond those qualities though, Lee is kind and that is a quality that simply pulls a thread through all others, cementing together his great skills with compassion." - Professor Von Sigler**

Lee's meritorious activities include BOSEF President and Biomass Group Leader, Irwin Prairie Frog Monitoring Lead, Toledo University Church Garden AmeriCorps Vista Member, Toledo-Lucas County Sustainability Commission Consultant, The Nature Conservancy Volunteer, U.S. Department of Agriculture Laboratory Technician (2022), UToledo Lake Erie Center Intern (2020-21) and UToledo Grounds Maintenance Worker. Lee graduated Magna Cum Laude.

Photo above (L-R):  
Dean Marc Seigar, Lee Harms and  
Dr. Jon Bossenbroek.

## DEPARTMENT OF MATHEMATICS AND STATISTICS

Chair, Dr. Geoffrey Martin

The Department of Mathematics and Statistics saw 22 undergraduate and 7 graduate students complete their degrees in the 2021-22 academic year!

Select highlights from the year include:

### Awards and recognitions received by our faculty members!

- Dr. Funda Gultepe was awarded a National Science Foundation grant titled “NSF LEAPS-MPS Surface subgroups of outer automorphism group of the free group and dynamics on the boundary”. The project was awarded for two years (01.01.22 to 12.31.23) with total funding of \$165,590, which includes training of students and the establishment of a 6-week summer program in mathematics for middle school students drawn from underrepresented communities. The established program, Math Corps UToledo Summer Camp, is a free program for middle school students and high school mentors from under-served communities in the Toledo area! [utoledo.edu/nsm/math-corps](http://utoledo.edu/nsm/math-corps)
- Greg Lewis, senior lecturer, participated in a workshop with high school math teachers as a higher education collaborator. This is in conjunction with UToledo’s Math 1180 ‘Reasoning with Mathematics’ gateway course. High schools across Ohio are implementing a version of this course that embraces a similar content and pedagogy as is done on the collegiate level. This program is part of a collaboration between the Ohio Math Initiative of the Ohio Department of Education and Ohio Higher Education. Greg will continue to support, visit and collaborate with local area high schools throughout the academic year.

### Research publications featuring both graduate students and faculty members!

- Dr. Alessandro Arsie, Chanaka Kottegoda (Ph.D. student) and Dr. Chunhua Shan published the paper “A predator-prey system with generalized Holling type IV functional response and Allee effects in prey”, in *Journal of Differential Equations* ([doi.org/10.1016/j.jde.2021.11.041](https://doi.org/10.1016/j.jde.2021.11.041)). In addition, the paper “High codimension bifurcations of a predator-prey system with generalized Holling type III functional response and Allee effects” was accepted in *Journal of Dynamics and Differential Equations*.
- Dr. Funda Gultepe had a paper published in the journal *Transactions of the American Mathematical Society (AMS)*, titled “A universal Cannon-Thurston map and the surviving curve complex”, with Christopher J. Leininger and Witsarut Pho-on. [doi.org/10.1090/btran/99](https://doi.org/10.1090/btran/99)
- Dr. Akaki Tikaradze had a paper published in one of the most prestigious international math journals, *Advances in Mathematics*, “The noncommutative Noether’s problem is almost equivalent to the classical Noether’s problem”. [doi.org/10.1016/j.aim.2021.108161](https://doi.org/10.1016/j.aim.2021.108161)
- Drs. Trieu Le and Akaki Tikaradze published a joint paper “A generalization of the Brown-Halmos theorems for the unit ball” in *Advances in Mathematics*, a very prestigious general math journal. [doi.org/10.1016/j.aim.2022.108411](https://doi.org/10.1016/j.aim.2022.108411)

### 2022 Department Outstanding Graduating Student Matthew Brown



**Matthew joined our program as a transfer student from Monroe Community College (MCC) ... The department finds that he is an exceptionally motivated and hardworking student. He is conscientious and has showed a great fund of knowledge and a willingness to go beyond the usual role of a student, demonstrating a commitment to continuity in furthering his education.” - Dr. Hiba Fayoumi, Lecturer**

Matthew’s meritorious activities include Research Experience for Undergraduates at Embry-Riddle Aeronautical University (2021), Undergraduate Researcher as well as co-author on a research publication, Math and Computer Science Tutor at MCC, Global Game Jam Participant at MCC (2019), Monroe County Community College Band Member (2016-present) and River Raisin Community Theater Participant (2017-2019). Matthew graduated Summa Cum Laude.

Photo above (L-R):

Dean Marc Seigar, Matthew Brown and Dr. Geoffrey Martin.



## DEPARTMENT OF PHYSICS AND ASTRONOMY

Chair, Dr. Sanjay Khare

The Department of Physics and Astronomy saw 11 undergraduate and 11 graduate students complete their degrees in the 2021-22 academic year!

Select highlights from the year include:

UToledo Astronomers are leading some of the first research projects on NASA's new James Webb Space Telescope. The University ranked No. 6 among all institutions worldwide in successful proposals for the first cycle of observing time. [utoledo.edu/features/astronomy](https://utoledo.edu/features/astronomy)

Dr. Karen Bjorkman, astronomer, provost and executive vice president for academic affairs, was elected to the Association of Universities for Research in Astronomy (AURA) Board of Directors for a three-year term, beginning July 1, 2021, through June 30, 2024.

Dr. Jillian Bornak, Prof. Nikolas Podraza, Admin Assistant Lisa Selmek and Dr. Kathy Shan were all recognized by the Office of the Provost as being educators who have positively impacted their students well-being, success or sense of community on campus during the fall 2021 semester through the "Shout Out" to Innovative Instructors and Staff campaign!

### Research publications featuring faculty and alum!

- Dr. Rupali Chandar, Dr. J.D. Smith and UToledo alum Dr. Adam Smercina (B.S. Physics, '15), published breakthrough research in the *Astrophysical Journal* (DOI: [10.3847/1538-4357/ac0c19](https://doi.org/10.3847/1538-4357/ac0c19)) which outlines their new method to establish the star-formation history of a post-starburst galaxy using its cluster population. The team used NASA's Hubble Space Telescope to develop a new method to look back in time and change the way we understand the history of galaxies.

### Awards and recognitions received by students and faculty!

- Somayeh Taghizadeh, Ph.D. student, won third place in the region at the Spring Symposium of the Ohio River Valley Chapter (ORVC) meeting of AAPM (American Association of Physicists in Medicine) on her talk, "Optimization of Permeability and Curie Temperature for Higher Heat Generation in the Innovative Thermo-Brachytherapy Seed".
- Prof. J.D. Smith was one of five winners chosen for the competitive Cottrell Plus SEED (Singular Exceptional Endeavors of Discovery) Awards for 2021 which offer a Cottrell Scholar the opportunity to start creative new research or educational activities. All of the 2021 awardees were for research, receiving a \$50,000 grant award for the research project.
- Dr. Aniruddha Ray was among 23 early career scientists to win funding (\$50,000) for research to accelerate the development of the next generation of imaging technologies as part of the inaugural year of Scialog: Advancing BioImaging, a three-year initiative supported by Research Corporation for Science Advancement, the Chan Zuckerberg Initiative and the Frederick Gardner Cottrell Foundation.
- Dr. Peuli Nath, post-doc (Ray Research Lab), was awarded the Ocean Insight Young Investigator Award second prize for her research on "Highly fluorescent nanoparticles with perovskite core for tumor imaging" at SPIE Photonics West 2022, which is the largest photonics conference in the world. This year there were more than eleven thousand in-person participants, and several thousand online, vying for this very competitive award.

### 2022 Department Outstanding Graduating Student Edward Walsh



**Teddy is a double-major in Astrophysics and Mathematics and he excels equally in both arenas. His contributions, including the development of a large, distributed database encompassing the entire Spitzer spectroscopy archive, have been truly essential. Building on this powerful foundation, we are wrangling literally millions of data frames into a comprehensive view of the infrared spectral Universe. In addition ... his efforts with the Spitzer Infrared Mapping Legacy Archive will also have a major impact on our entire field as it gears up for incredible new scientific discoveries with the next great infrared space observatory — the James Webb Space Telescope." - Professor JD Smith**

Teddy's meritorious activities include Undergraduate Researcher for the Spitzer IRS Mapping Legacy Archive (SIMLA), UToledo Food Recovery Network, Deans List and Presidents List. Teddy graduated Summa Cum Laude.

Photo above (L-R):

Dean Marc Seigar, Edward (Teddy) Walsh and Dr. JD Smith.

*Thank you to Dr. Sanjay Khare for serving as Department Chair for the past six years. His hard work and dedication are greatly appreciated. Effective July 1, 2022, Dr. Nikolas Podraza will be serving in the role of Department Chair. We wish him great success!*



## UToledo Wright Center for Photovoltaics Innovation and Commercialization (PVIC) “Best of 2021-22”

- The National Renewable Energy Laboratory (NREL), University of Colorado Boulder and UToledo Department of Physics & Astronomy and PVIC scientists have developed a tin-lead perovskite cell that overcomes problems with stability and improves efficiency. The new cell, a tandem design with two layers of perovskites, measured a 25.5% efficiency. The research behind the design was published in *Nature Energy* in the article, “Carrier control in Sn–Pb perovskites via 2D cation engineering for all-perovskite tandem solar cells with improved efficiency and stability” ([doi.org/10.1038/s41560-022-01046-1](https://doi.org/10.1038/s41560-022-01046-1)). UToledo article contributors: Dr. Xiaoming Wang, Dr. Chongwen Li and Dr. Yanfa Yan.
- Using templated film growth, scientists from UToledo’s PVIC and NREL have achieved antimony selenide solar cells with 8.5% efficiency. Applications include bottom cell in tandem PV for space. The technical details behind the cell was published in *Advanced Functional Materials*, “Templated Growth and Passivation of Vertically Oriented Antimony Selenide Thin Films for High-Efficiency Solar Cells in Substrate Configuration” ([doi.org/10.1002/adfm.202110032](https://doi.org/10.1002/adfm.202110032)). UToledo article contributors: Suman Rijal, Rasha A. Awni, Sandip S. Bista, Manoj K. Jamarkattel (graduate students); postdoc researcher: Dengbing Li and faculty: Dr. Michael Heben, Dr. Zhaoning Song and Dr. Yanfa Yan.
- Dr. Zhaoning Song, research assistant professor, and Dr. Yanfa Yan, Distinguished University Professor, who previously set the world record for the conversion of sunlight to electricity using perovskites and increased total electrical power generated by using two different parts of the sun’s spectrum received a new grant award from the U.S. Department of Energy. This one-year grant of \$300,000 was awarded to advance research that could lead to the integration of promising perovskite solar cell technology into existing production lines for cadmium-selenide-telluride (CST)-based solar cells, maximizing the performance of thin-film tandem solar cells and reducing the costs of energy!

Visit the UToledo Wright Center for Photovoltaics Innovation and Commercialization (PVIC) website at: [utoledo.edu/research/pvic/](https://utoledo.edu/research/pvic/)

## UToledo Lake Erie Center News

- The UToledo Lake Erie Center dedicated its new 21-foot boat named the R/V Spangler in honor of Dave Spangler, a Lake Erie charter boat captain and water-quality advocate who died in 2020, at a ceremony that was held on Tuesday, May 10, 2022, at the research center.  
  
The event to christen the Spangler was also an opportunity for the LEC to publicly acknowledge and thank Women & Philanthropy at The University of Toledo for supporting the purchase of the boat with a \$50,000 grant!  
  
“Demand for research vessel time is growing. The Spangler will expand our ability to conduct research that advances understanding of Great Lakes ecology, informs public policy and prepares the next generation of scientists to face tomorrow’s challenges,” said Dr. Thomas Bridgeman, professor of ecology and director of the UToledo Lake Erie Center, who has studied harmful algal blooms for two decades.
- The 12<sup>th</sup> International Conference on Toxic Cyanobacteria (ICTC 12), a joint effort with the Interdisciplinary Freshwater Harmful Algal Blooms Workshop, was held at The University of Toledo, May 22-27, 2022. Dr. Thomas Bridgeman was part of the Organizing Committee for this conference that was held in conjunction with BGSU.
- Dr. Bill Hintz and Jordan McKenna (M.S. student, UToledo Lake Erie Center and Department of Environmental Sciences) are continuing ongoing work at UToledo on lake sturgeon. Ms. McKenna will be helping to track baby lake sturgeon that are being reared at The Toledo Zoo, and another hatchery, and re-introduced to Lake Erie.
- Touhue Yang, M.S. Ecology, ‘22 (Mayer lab, UToledo Lake Erie Center and Department of Environmental Sciences), was one of the ten Cashner Award recipients for 2021! Cashner Awardees receive tailored professional development training, mentorship and networking opportunities, as well as one year of membership to the ASIH. They also receive a monetary prize (\$1,000) to help cover registration, travel, and/or lodging costs for attending the annual Joint Meeting of Ichthyologists and Herpetologists.

Visit the UToledo LEC website at: [utoledo.edu/nsm/lec/](https://utoledo.edu/nsm/lec/)





## DIVERSITY, EQUITY AND INCLUSION INITIATIVES

The College of Natural Sciences and Mathematics Diversity, Equity and Inclusion Committee hosted its “1<sup>st</sup> NSM Diversity Day” at The University of Toledo on Friday, April 22, 2022, and it was a HUGE success!

The goal of the event was to foster and promote a more diverse community of students, faculty and staff while also encouraging collaboration among people of different backgrounds. We believe that an inclusive work environment provides an atmosphere that allows all individuals to attain their greatest potential and achieve the greatest benefits for all.

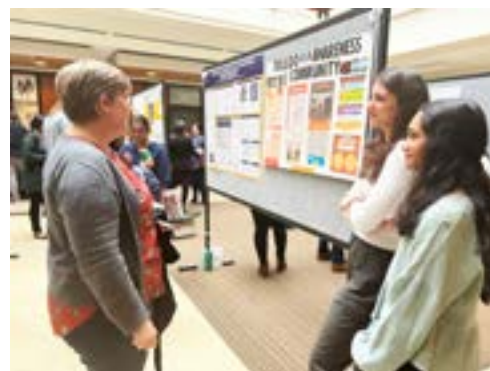
There were two outstanding guest speakers and a poster session showcasing the research, teaching and service in the college.



**Keynote Lecture:** “Mentoring Well: Building Bridges to Access and Success”, **Dr. Beronda Montgomery**, MSU Foundation Professor, Michigan State University



**Guest Lecture:** “The Celebration and Risks of Transgender Visibility”, **Leslie McMurray**, Transgender Education and Advocacy Associate, Resource Center (virtual)



The event included an awards ceremony to recognize the Best Poster presentations and Diversity Achievements of students, faculty and staff from the College of Natural Sciences and Mathematics.

### Congratulations to the 1<sup>st</sup> NSM Diversity Day Student Poster Winners:

- Shannon Costello (Physics & Astronomy)
- Tatiana de Souza (Biological Sciences)
- Emmanuel Efemena Destiny (Environmental Sciences)
- Nipunika Godage (Chemistry & Biochemistry)
- Marlena LaBoy (Biological Sciences)
- Seyi Ogundeji (Environmental Sciences)
- George Okoko (Environmental Sciences)
- Nahshon Puente (Biological Sciences)
- Kevin Shao (Mathematics & Statistics)
- Robert Snuggs (Physics & Astronomy)
- Radhika Thanvi (Chemistry & Biochemistry)



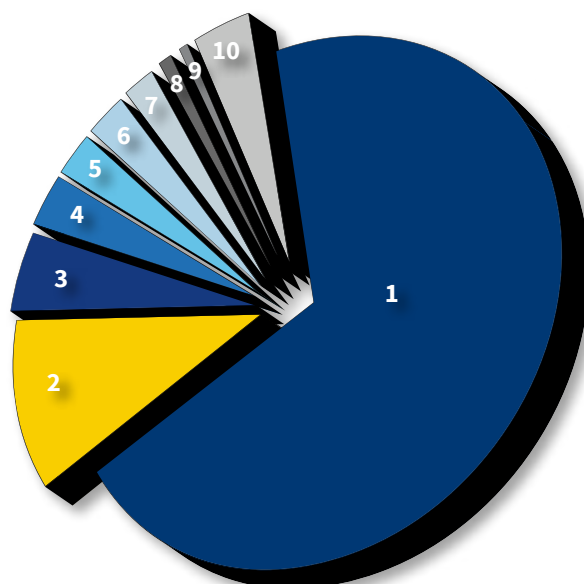
See the full list of winners and award recipients (or scan QR code above): [utoledo.edu/nsm/inclusion/achievement-awards](https://utoledo.edu/nsm/inclusion/achievement-awards)

**Thank you to everyone that participated and congratulations to all of the amazing winners and award recipients!**

### The University of Toledo Foundation Progress Fund Gifts Distribution for the College of Natural Sciences & Mathematics:

1. Natural Science and Mathematics Wetlands Fund	\$2,229,188.00
2. Ritter Planetarium Projector Fund	\$344,150.00
3. The Doreen & Lyman Spitzer Scholarship Fund	\$150,000.00
4. Edward Ebert Foundation Scholarship Fund	\$100,000.00
5. Harold C. & Charlotte L. Shaffer Chair Fund	\$79,866.61
6. Pavol (Paul) Kovac Fund	\$76,843.34
7. Joseph & Mary Capobianco Memorial Fund	\$61,750.00
8. Water Chemistry & Environmental Analysis Fund	\$26,250.00
9. Chemistry Progress Fund	\$21,586.88
10. ALL Other Progress Funds (total)	\$110,673.19

**TOTAL GIFTS (July 1, 2021-June 30, 2022) \$3,200,308.02**



## THANK YOU TO OUR DONORS

*The College of Natural Sciences and Mathematics wishes to recognize all our generous and loyal supporters! Our students, faculty and staff are incredibly thankful for the continued generosity of our amazing community. The following list reflects gifts made July 1, 2021 - June 30, 2022.*

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## GIVE A GIFT, MAKE A DIFFERENCE!

Join our other generous donors in supporting education and excellence in the College of Natural Sciences and Mathematics!

For more information about giving, including setting up scholarships or additional gift funds, please contact Nick Butler, Director of Development - Colleges of Natural Science & Mathematics, Arts & Letters and Libraries Development at 419.530.5413 or [nick.butler@utoledo.edu](mailto:nick.butler@utoledo.edu).

You can also MAKE YOUR GIFT ONLINE at [give2ut.utoledo.edu](http://give2ut.utoledo.edu) (or scan QR code below) to one of our established funds (under Funds by College):

- College of Natural Sciences and Mathematics Progress Fund (2401937)
  - Supports various and priority needs of the College of Natural Sciences and Mathematics
- Friends of the College of Natural Sciences and Mathematics (2401947)
  - Supports programs, needs and opportunities for the College of Natural Sciences and Mathematics
- Natural Sciences and Mathematics General Scholarship Fund (2401949)
  - Provides scholarships for students in the College of Natural Sciences and Mathematics



Established in 1921, The University of Toledo Alumni Association works to foster interest, support and involvement among alumni and students in University and alumni affairs, as well as to inform the University of alumni success.

For additional information, events and how to get involved, visit the UToledo Foundation website at: [utfoundation.org](http://utfoundation.org) or, visit the UToledo Alumni Association website: [toledo.alumni.org](http://toledo.alumni.org)



## 2021 Distinguished Alumni Award Recipient

The UToledo Alumni Association's annual Homecoming Gala, held in the Lancelot Thompson Student Union Auditorium, is a chance to thank and honor our alumni who make an impact every day in communities across the country and the world. On Friday, Oct. 8, 2021, at the annual Homecoming Gala, **Dr. Ibraheem Badejo** (Ph.D. Chemistry, '89) was named the Distinguished Alumni Award Recipient for the College of Natural Sciences and Mathematics. We offer our sincere congratulations to Dr. Badejo on receiving this most deserved award!



Photo above (L-R): Dr. Ibraheem Badejo (top center) and Dean Marc Seigar (bottom center).

Photo left: 2021 Distinguished Alumni Award Recipient, Dr. Ibraheem Badejo.

Watch the UToledo Alumni Homecoming Gala Video to hear from Dr. Badejo and the other award recipients. Scan QR code below:



Photo left: New Distinguished Alumni installment in Wolfe Hall, thanks to the generosity of the UToledo Alumni Association.