# Millersville University

## COLLEGE OF SCIENCE AND TECHNOLOGY

**2018-2019 Annual Report**

**Executive Summary**

**Mission**

The mission of the College of Science and Technology is to prepare our students for a lifetime of professional work in our respective disciplines by providing the highest quality programs that lead to baccalaureate and master's degrees in the areas of Mathematics, Science, and Technology as well as doctoral degrees in Nursing. The College has a strong commitment to teaching and learning, research, outreach, and diversity. Furthermore, we provide general education for the larger student body and continue our long tradition of excellence in teacher preparation. The College provides leadership to community organizations and fosters collaborative partnerships that lead to opportunities for student research, internships, cooperative educational experiences, and pathways to employment.

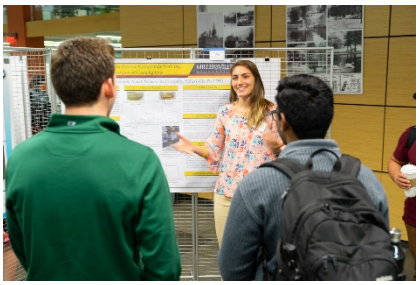
**Goals and Objectives**

The College of Science and Technology will continue to distinguish itself as a center for excellence in the areas of mathematics, science, and technology that provides a dynamic academic environment in which students and faculty can grow professionally. We are committed to the preparation of graduates who solve problems, communicate effectively, work collaboratively, and demonstrate mastery of their disciplines.

**Contribution to the University Strategic Plan**

Departments integrate high-impact practices into their curriculum and degree programs in various ways, including:

- Internships: over 40 students from eight departments within the College participated in credit bearing internships, including those students pursuing their multidisciplinary degree in Environmental Health and Emergency Management. An additional 36 students engaged in internships through OSEH 440, and numerous students participated in non-credit internships.
- Research: Over 110 distinct undergraduate students from eight departments participated in faculty-mentored experiences with numerous additional undergraduate and graduate students participating in research experiences that were incorporated directly into their courses.



*Student presentations at 2019 Made in Millersville.*

- First-Year Seminar/Experience: Seven departments within the College have faculty teaching UNIV 103 courses.
- Service Learning: Several departments (e.g. ESCI, GEOG, NURS, and UNIV) integrated these projects and experiences into multiple courses.
- Study Abroad: Faculty-led study abroad courses were provided by several faculty, including Dr. Len Litowitz (AEST) [ITEC 304, Summer: Iceland] and Dr. Xemina Catepillán (MATH) [MATH 102, Summer: Yucatán Peninsula, in collaboration with the Department of Social Work]. Other students participated in international experiences through individual work with faculty.



*(Left) AEST's Marauder Graphics students at the 2018 Specialty Graphics Imaging Association conference. (Right) MSA Safety's May 2019 visit to Millersville University with their donation of equipment to the Occupational Safety & Environmental Health (OSEH) program, facilitated by Mr. Joe Gormley (B.S. OSEH, Class of 1997) of MSA Safety.*

**Selected Highlights**

Development, Events, and Program Updates

- The College is extremely grateful for the support it has received from individuals and outside organizations. Several scholarships were established this past year, including the Wubah Family Endowed Scholarship, Scott and Deborah Jacobs Meteorology Scholarship, James and Judith Hower Scholarship in Earth Sciences, Trudy Tyler Yefko '77 Biology Scholarship, Dr. R. Edward Rajaseelan Excellence in Chemistry Scholarship, Steinman Foundations Intelligencer Printing Underclassmen Scholarship, and the Joyce Denelsbeck King '83 Scholarship for Women in STEM.
- Contributions from over 230 individuals either created new or enhanced existing endowed programs within the College. Some of the existing endowed programs that received a significant number and/or amount of contributions include: the Lisolette R. Wehrheim Scholarship in Nursing, Dr. Paul G. Specht Occupational Safety and Environmental Health Alumni Scholarship, Meteorological Endowment in memory of Russell L. DeSouza, Gail & Kenneth Twiford Biology Award, Dr. William J. Yurkiewicz Undergraduate Research Fellowship, Brent D. Frey Technology Education Scholarship, Faraday Physics Scholarship, James E. Koken Science Scholarship, Joseph and Anita Meier Memorial Scholarship, Paul J. McInerney Memorial Lecture Fund Endowment, Harry A. '65 and Carolyn J. Lohss Physics Annual Award, Steinman Foundations Intelligencer Printing Awards, Earth Sciences Travel Endowment, STEAM Learning Program, Applied Engineering, Safety & Technology Facilities & Equipment Fund, College of Science & Technology Miscellaneous Gifts Fund, Diana's Dreamers: Determined to defeat Breast Cancer Endowment, STEM Inclusion Scholarship Fund, and The Choi Family, Class of 1996, Biology Endowment for Anatomic Studies.
- The College has also benefitted from the support received for individual department programs, particularly those enhancing the variety of research and educational experiences being undertaken by our students. Some of the projects funded this past year include the Geology Well Project, Meteorology equipment (multi-video map server and a Varsala Wx sensor), student scholarships for ITEC 304 (Lancaster County Solid Waste Management Authority), the Karen A. Murley Student Undergraduate Research Fellowship Program in Chemistry, and Northrop Grumman's contributions to the annual Pennsylvania Association of Computer and Information Science Educators (PACISE) conference. Along with equipment donations, such as those provided by MSA Safety, a range of department events were also supported (e.g. the Alumni & Friends reception at the American Meteorological Society's annual meeting was made possible through

the support from AccuWeather, Harris Corporation, Weather Trends International, Inc., and Millersville University's Alumni Association).

- We are also grateful to the Brossman Foundation for their continued sponsorship of the Science Lectureship and Science Knowledge Competition Examination, Glenna Hazeltine's and Phoenix Contact Inc's continued sponsorship of the Women in Mathematics, Science, and Technology Conference, and Phoenix Contact Inc's continued sponsorship of the Pennsylvania Central Region Science Olympiad.
- Dr. Kathryn Allen (CHEM), Dr. Dan Albert (CHEM), and Dr. Talor Walsh (ESCI) led the PA Central Region Science Olympiad Competition held at Millersville University, March 2, 2019. The success of this event was made possible through the efforts of over 100 volunteers, of which about 10 were MU faculty/staff and 80 were MU students. Due to their efforts, over 650 students from 54 schools participated in this year's event, which was sponsored by *Phoenix Contact Inc*.
- The 32nd Glenna Hazeltine Women in Mathematics, Science, and Technology Conference was held at Millersville University, April 2, 2019. The event, coordinated by Dr. Nazli Hardy (CSCI) and the conference committee, hosted over 180 participants from 48 area middle schools and high schools (grades 7 through 12) in 6 Pennsylvania counties. This year's program was supported by the *Hazeltine Family* and *Phoenix Contact Inc*. That evening, a free performance of '*Forging Frontiers: Women Leaders in STEM*' was given to members of the University and the public (supported by the Office of the Provost and SCTE) that was followed by a Q&A discussion led by author/actress Ms. Kate Campbell Stevenson. MU members of the conference committee were: Dr. Angela Cuthbert (GEOG), Dr. Teresa Hartmann (NURS), Dr. Carol Hepfer (BIOL), Mrs. Marianne Frantz, Dr. Michael Jackson, Dr. Maja Klosinska (BIOL), Dr. Betty-Jo Legutko (AEST), Dr. Heather Lehman (BIOL), Dr. Xin Li (PHYS), Dr. Baoling Ma (MATH), Ms. Carol Reichler, Dr. Cynthia Taylor (MATH), and Dr. Sepideh Yalda (ESCI).


*(Left) Dr. Jenna Carpenter's keynote presentation at the 32nd annual Glenna Hazeltine Women in Mathematics, Science, and Technology Conference. (Right) Dr. Natalia Dushkina (Physics) delivers her presentation to conference participants.*

- The 34th Brossman Foundation and Ronald E. Frisbie Science Lectureship (speaker: Dr. S. James Gates) was held at Millersville University, November 15, 2018. The event was coordinated by Dr. Lyman Rickard (CHEM) and the lectureship committee. Despite the cancellation of the program due to weather, the presentation was recorded and distributed to area schools and the Science Knowledge Competition Examination took place at each of the participating schools (34 participants from 17 high schools). This event was supported by the *Brossman Foundation*. MU members of the lectureship committee were: Dr. Mark Atwater (AEST), Dr. Angela Cuthbert

(GEOG), Dr. Sam Earman (ESCI), Mr. Ron Frisbie, Jr. (F&A), Dr. Tariq Gilani (PHYS), Dr. Nazli Hardy (CSCI), Ms. Lynnea Holler, Dr. Brent Horton (BIOL), Dr. Michael Jackson, Dr. Baoling Ma (MATH), and Ms. Carol Reichler.

*(Left) Biology and Physics majors meeting with Dr. Jim Gates during his November 2018 visit to Millersville University. (Right) MU faculty and students with Ms. Kate Campbell Stevenson at her performance 'Forging Frontiers: Women Leaders in STEM' (April 2019).*

- The College of Science and Technology hosted the 5th Annual PASSHE Undergraduate Research Conference in Science, Technology, Engineering and Mathematics in October 2018 while the Department of Computer Science hosted the annual PACISE conference in April 2019. At this year's conference, Dave Feltenberger, Staff Software Engineer at Google (B.S. Computer Science, Class of 2003; MS University of Maryland, Baltimore County) served as keynote speaker.
- The 32nd Summer Science Training Program (SSTP) was held during the 2018 Summer at Millersville University. The program, coordinated by Dr. Ryan Wagner and Dr. Joel Piperberg (BIOL), included the participation of 23 MU faculty and staff. This annual program is offered in July to academically talented students entering grades 8 – 12. SSTP provides students with learning opportunities typically not available at the pre-college level through a wide range of academic disciplines in mathematics and science with a focus on intensive student-teacher interaction, advanced-level learning, and research and problem-solving experiences.

<u>Examples of Student Achievements</u>

- Melody Aleman (B.S. Biology, Class of 2018) was a recipient of the 2019 National Science Foundation Graduate Research Fellowship Program (GRFP) while F. Omar Fernandez (B.S. Chemistry, Class of 2019) and Lauren Ostopowicz (B.S. Chemistry, Class of 2018) received Honorable Mentions. This national competition selects awardees (2,051 in all) from among more than 12,000 applicants submitted by individuals from all 50 U.S. states, as well as the District of Columbia and U.S. territories. Honorable mention recognition was awarded to 1,540 individuals. GRFP provides three years of financial support within a five-year fellowship period: $34,000 annual stipend and $12,000 cost-of-education allowance to the graduate institution.
- Benjamin Fellman and Chad Wiley (Earth Sciences – Meteorology) are the recipients of the 2019 Ernest F. Hollings Scholarship funded through National Oceanic and Atmospheric Administration.
- Erin A. Jones (B.S. Meteorology, Class of 2018) is the recipient of the Pennsylvania State System of Higher Education 2019 Syed R. Ali-Zaidi Award for Academic Excellence. She is also the recipient of the 2019 American Meteorological Society Graduate Fellowship and will be attending the PhD program at the University of Oklahoma next fall.
- Dr. Baoling Ma (Mathematics) and Jack Warner (B.S. Mathematics, Class of 2017) co-authored: B. Ma, C. Li, and J. Warner, "Structured mathematical models to investigate the interactions between Plasmodium falciparum malaria parasites and host immune response," in *Mathematical Biosciences*, vol. 310, pp. 65-75 (2019), doi: 10.1016/j.mbs.2019.02.005.

- Tim Sakowski (B.S. Geology, Class of 2019) and Talor Walsh (Earth Sciences) presented "Evaluating Subsurface Fractures in the Appalachian Basin," at the Geological Society of American Annual Meeting (November, 2018).
- Connor Billings (Computer Science major) received Best Poster recognition at PACISE 2019 while several teams competed at PACISE 2019's programming contest including: Dan Hartenstine, Connor Billings, and Henry Schmale (receiving first place); Sean Malloy, Jesse Schnupp, and Anthony Burnett (receiving second place); with Matt Fosset, Zack Mixa, and Jimmy Roche (receiving third place).
- MU received the 2018 IAEM Chapter of the Year Award (advisor: Dr. Sepideh Yalda) from the International Association of Emergency Managers (IAEM) while the MU ACS Student Chapter (advisor: Dr. Lyman Rickard) received a National Commendable award from the American Chemical Society (ACS) for its 2017-2018 activities.
- Madison Martin (B.S. Mathematics major, Statistics and Actuarial Science concentrations) and Michael Weaver (B.S. Mathematics, Statistics and Actuarial Science concentrations, Class of 2019) passed the Actuarial Exam P: Probability.
- Kevin Goring (B.S. Mathematics major) will attend the Summer Institute in Research Education in Biostatistics at Emory University (funded by the National Heart, Lung and Blood Institute).


*(Left) Students, faculty, alumni, and other friends of the University at the 99th American Meteorological Society Annual Meeting. (Right) Dr. Hugh Herr (B.S. Physics, Class of 1990) receiving the honorary Doctor of Humane Letter degree from Dr. Daniel Wubah at the Spring 2019 Undergraduate Commencement ceremony.*

Examples of Faculty Awards

- Dr. Carol Hepfer, Department of Biology, was recognized as *Educator of the Year* (2018-2019).
- The Biology Mentorship Program (led by Dr. Brent Horton) was the recipient the *2018 Inspiring Programs in STEM Award* by Insight into Diversity magazine. This program focuses on increasing the success and retention of underrepresented minority students in the biology major.
- Dr. Sepideh Yalda (Earth Sciences and Director, Center for Disaster Research and Education) and Dr. Kirsten Bookmiller (Government & Political Affairs) were awarded a grant from the American Red Cross on the North American Humanitarian Response Initiative: $155,000 (2018).
- Dr. Len Litowitz (AEST) was recognized as a *Campus Sustainability Champion* by the Pennsylvania Environmental Resource Consortium.
- The Millersville University Integrative STEM Education Methods (ISEM) Program Faculty and Research Team, under the direction of Dr. Sharon Brusic (AEST), received the *2019 Gerhard Salinger Award* for Enhancing STEM Education through Technological/Engineering Design-Based Instruction. The ISEM program faculty and research team also includes Dr. Nanette Dietrich

(EDFN), Dr. Jason Petula (EMEE), Dr. Jennifer Shettel (EMEE), Dr. Scott Warner (AEST), Dr. Janet White (MATH), and Dr. Charlton Wolfgang (EMEE).

Examples of Notable Alumni Achievements

- Dr. David Walton (B.S. Chemistry, Class of 2012) earned a Ph.D. in chemistry from the California Institute of Technology and is now a Postdoctoral Fellow at Stanford University.
- Dr. Jillian Weissenrieder (B.S. Chemistry, Class of 2015) earned a Ph.D. in BioMedical Sciences from Penn State Hershey Medical School and is now a Postdoctoral fellow at the University of Pennsylvania.
- Dr. T. Joseph Dennes III (B.S. Chemistry, MU Class of 2004; Ph.D. Princeton University, 2008), was the recipient of the 2018 MU Young Alumni Achievement Award. He visited the campus in April 2019, met with groups of students and faculty along with giving a seminar presentation.

*(Left) Dr. Joseph Dennes delivering his seminar presentation during his April 2019 visit.*
*(Right) Members of the Class of 2019 from the Department of Chemistry.*

**Potential Opportunities for the Next Academic Year**

- Enhancing Educational Pathways for Students
  - SCTE faculty will investigate (and if feasible, develop) new curricular programs and collaborative partnerships in consultation with area businesses and through feedback from experts across the national landscape; and
  - Continue expanding online course offerings in support of the University's General Education and Online Degree programs.
- Enhancing Student Success Initiatives
  - Continue improving the retention of students, particularly students traditionally underrepresented in STEM disciplines through programs such as the Biology Mentorship Program and the department's use of the '*Biology Toolbox*' initiative, the Department of Chemistry's peer learning program, and the Meteorology (MET) Mentorship Program.
- Enhancing Access to Cutting-Edge Technology
  - SCTE faculty and staff will continue seeking and acquiring financial support (both internal and external) to meet the instructional, scholarly, and service needs of departments and our students for a variety of equipment and computationally intensive activities. This includes working with members of Advancement to enhance donor support for the College of Science and Technology.