

The University RESEARCH NEWSLETTER

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The University Research Newsletter
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MILLERSVILLE UNIVERSITY OF PENNSYLVANIA



A Message from the Provost

I hope you are all excited about being back at Millersville University for the spring 2022 semester! I am hopeful that 2022 will

allow us to continue to be safe, but also get back to living a life with more choices than we have had in the past two years.

For this issue, I wanted to share with you a bit about how I became a microbiologist. In my sophomore year of college, I took a microbiology class. I loved the class but really enjoyed the laboratory part the best. After finishing the class, my microbiology professor, Dr. Vermuelen, or Dr. V as we called him, asked if I wanted to do research with him. At that time, I was thinking it would be an opportunity to continue with the laboratory experiences we had done as part of the class and readily agreed.

When I started in the laboratory, Dr. V provided me with several background papers for the project he was working on and asked that I read them prior to our first discussion. When we met, he indicated that he was looking at unique bacterial cell properties that indicated the culture was in a different stage of the growth cycle. I was told what my part of the project would entail, and I started the experiments. After collecting preliminary data, I went to Dr. V to share what I had found and asked, "Is this right?" Although this was almost 40 years ago(!), I still remember his response. To paraphrase, he said that he did not know because no one had done these experiments before. At first, I was shocked, but then when it sank in, I realized that I was actually a scientist. The project resulted in my first coauthored paper. This experience really changed the focus of my career, as I knew I wanted to continue my studies to earn a Ph.D. so that I could also teach and work with students in my own lab on a college campus. I am extremely grateful for that experience and always strived

to bring that same joy of discovery to the many students I have had the privilege to work with over my career. I want to continue to encourage our students to engage in the EPPIC value of Exploration to pursue scholarly/creative opportunities with faculty here at Millersville University and/or through internship opportunities and see what that leads to!

Please take some time to review the featured article on the Office of Sponsored Programs and Research. Now that we have Associate Vice President Jeffry Porter on board, we will be transitioning undergraduate research programs, including the University Research Newsletter, to the Office of Sponsored Programs and Research starting in fall 2022. I want to thank Dr. Elizabeth Thyrum and her honors student editors for this and past issues of this publication. It is a tremendous amount of work to put together each issue, and I am extremely grateful that she led this effort so that we could share what our undergraduate students and faculty have been doing with a broader community.

Some additional highlights in this issue include an introduction to an exciting new digital journal that is being started by Dr. Kerrie Farkas and professor Tatiana Pashkova-Balkenhol. This new digital, community-based journal is affiliated with Millersville University and focuses on Lancaster County and the surrounding area. The Engage for Change Journal will focus on public engagement and issues affecting the community. Additionally, in this edition you will find highlights of undergraduate research projects, including honors theses.

I wish you a safe and successful spring 2022 semester.

Gail E. Gasparich, Ph.D.
Provost and Vice President for Academic Affairs

IN THIS ISSUE

- 1 Introduction
- 2 A New Look at Research and Sponsored Programs
- 4 Paving the Way for New Principles: Research and Podcast Program for Graduate Students
- 5 Student/Faculty Collaboration Within the Chemistry Department
- 6 Engage for Change Journal: Millersville's Newest Academic Journal
- 7-8 Student Research Recognition
- 8 Newsletter Student Staff

Millersville University

A NEW LOOK AT RESEARCH AND SPONSORED PROGRAMS

IT IS MY PLEASURE TO INTRODUCE MILLERSVILLE UNIVERSITY'S NEW **OFFICE OF GRANTS, SPONSORED PROGRAMS AND RESEARCH**.

THE MISSION OF THE OFFICE IS STRAIGHTFORWARD: TO **1) INCREASE EXTERNAL FUNDING THROUGH GRANTS AND CONTRACTS TO THE UNIVERSITY TO SUPPORT STUDENT PREPARATION, SCHOLARSHIP AND SERVICE AND 2) EFFECTIVELY COMMUNICATE THE SCOPE, MAGNITUDE AND IMPACT OF THE RESEARCH, SERVICE AND CREATIVE ACTIVITY CARRIED OUT BY OUR EMPLOYEES AND STUDENTS AT MILLERSVILLE UNIVERSITY**. THIS ARTICLE PROVIDES A VERY BRIEF, HIGH-LEVEL OVERVIEW OF RESEARCH AND SPONSORED PROGRAMS AT MILLERSVILLE UNIVERSITY.

FACULTY SCHOLARSHIP

Since July 1, 2020, 50 faculty or administrators from 21 departments and the Office of the President, Academic Affairs, Finance and Administration, and Student Affairs and Enrollment Management submitted 91 grant proposals, requesting a total of \$32,096,000. Of those, 56 proposals totaling \$20,300,000 were approved for funding, with award amounts ranging from \$1,000 to \$4,300,000. The duration of funded projects ranges from one month to five years. Ten of those 91 proposals are still under review.

Most of our sponsored projects involve teams of collaborators at universities, industries, school districts, local governments and community organizations. Many of our faculty are sought out and invited to lead or participate in grant-funded work by virtue of their reputations and past contributions. On behalf of grant makers, our faculty, staff and students improve the

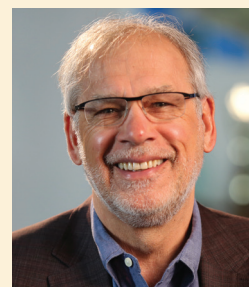
efficiency of industrial processes, explore new configurations of chemical molecules, improve the digital literacy of the adult workforce and provide federally mandated safety training to local industry workers.

The majority of competitive grant funding to Millersville comes from federal agencies, such as the National Science Foundation and the Department of Education. Federally funded projects at Millersville include basic research, applied research and service. Grants from state agencies and private foundations tend to fund service projects. Grants and contracts from business and industry tend to fund applied research to solve novel immediate problems.

More than half of the grants we receive support service projects, such as helping teacher's aides earn teaching certificates, training public health workers to win the battle against the opioid epidemic, or upskilling workers to compete in the fast-changing job market. Student fellowship grants in STEM education, pedagogical research and developing new courses are also common themes.

WHY WE DO IT

Following are explanations from two of our research-active faculty about the importance of original faculty research to their roles as University educators:



Dr. Richard Clark

"Hands-on, authentic experience is the highest form of learning. Expertise can only be gained when experience is an integral part

of the foundation. An educator is always teaching. Supervision is an integral part of the learning process. In the best situations, classroom and experiential learning complement each other."

Dr. Richard Clark, Professor, Department of Earth Sciences

"We utilize our research program to teach, mentor and train future scientists. And preparing chemists is an in-person

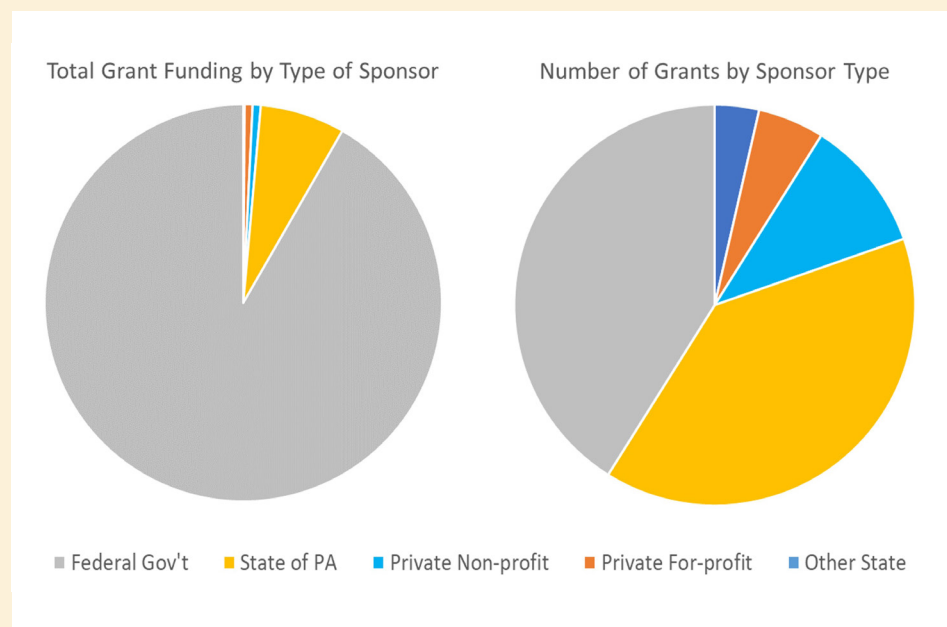


Figure 1. Proportions of funding and number of grants received from different types of sponsors during the period July 1, 2020, through December 31, 2021.

pursuit—with no virtual substitute. Chemistry is a hands-on, try-it-and-fix-it science. My organic polymer laboratory allows students to attempt new reactions to produce original macromolecules; this labor-intensive process gives them the chance to see some experiments fail and... to create meaningful solutions to complicated and challenging synthetic problems.”



Dr. Kathryn Allen

Dr. Kathryn Allen, Assistant Professor, Department of Chemistry

While most of our faculty's grant-funded projects include compensated

roles for undergraduate and graduate students, Millersville University also offers an array of internally funded student grants.

During 2021, 83 students were awarded \$142,000 from 14 different University-funded grant programs for research, service and creative projects. Some of the grant programs are intended for students working in a specified discipline, while others are available to students campus-wide. The internal student grant amounts range from \$500 to \$6,500. Most of the student grant programs are funded by gifts to MU's endowment, while others are budget line items in the University annual budget.

While the subject matter and activity for which student grants are made varies as widely as the academic departments and degree programs across campus—from performing arts and human services, to the humanities and physical sciences—the single commonality among the grant programs is the requirement that the students be in a mentored environment. Student research is one of several high-impact practices Millersville University embraces to advance students through their degree programs. The hands-on experience

deepens their content knowledge but also develops the “soft skills” so sought after by employers—goal setting, problem solving in a team, and dealing with criticism and failure. The immersive experience of mentored research is itself a pedagogy—that is, research as a teaching method.

Two of our frequent student research faculty mentors explain the importance of mentored student research as a high-impact practice in student preparation:

“Mentoring students to be engaged in research leads to many positive outcomes. For example, when students engage in research, they develop important research skills—analyzing, interpreting, presenting data and thinking critically. These scientific skills are foundational for career development and advancing practices in the student's field of study.”



Dr. Lauren Kaiser

Dr. Lauren Kaiser, Assistant Professor, Department of Psychology

“The inclusion of students in research projects exposes them to the myriad of

nuances the real world holds. This then becomes a test bed of opportunity to reinforce critical and scientific thinking, problem-solving and collaboration: all of which are necessary for successful 21st-century careers.”



Dr. John Haughey

Dr. John Haughey, Assistant Professor, Department of Applied Engineering, Safety & Technology

I invite readers to visit the Office of

Grants, Sponsored Programs and Research website at www.millersville.edu/spra to learn more about research and sponsored programs at Millersville University, and to watch for the inaugural edition of Millersville University's new digital Research Magazine in fall 2022. Issues of the Magazine are planned to tell the stories of Millersville University students, faculty and alumni forging important, lasting connections between the classroom, the laboratory or studio, and society.

Jeffrey Porter, Associate Vice President for Grants, Sponsored Programs and Research. ♦



PAVING THE WAY FOR NEW PRINCIPLES: RESEARCH AND PODCAST PROGRAM FOR GRADUATE STUDENTS

Written by Dr. Tiffany Wright and Dr. Ann Marie Licata
Edited by: Maddie Engleman

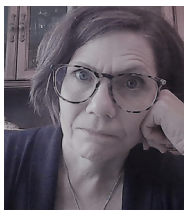


1.) WHAT ARE EACH OF YOUR TITLES, AND WHEN DID BOTH OF YOU START WORKING AT THE UNIVERSITY?



Dr. Tiffany Wright: Associate professor, started tenure track, August 2011. I taught school law as an adjunct in spring 2011. I am the graduate coordinator of the

Program in Leadership for Teaching and Learning. Also, I am the cofounder and former codirector of the joint Ed.D. program in educational leadership.



Dr. Ann Marie Licata: Assistant professor, started working at MU in February 2015 as the director of the Pennsylvania Inclusive Higher Education Consortium, funded

through a federal grant; started as full-time faculty in fall 2020.

2.) WHAT IS THE NATURE OF YOUR EDUCATION RESEARCH?

The outlined goals of the overall research/podcast production experience are as follows:

1. Provide an action research-based technological experience for preprincipal candidates in the educational leadership program that will foster their growth in inclusion, technology implementation and visionary leadership.
2. Ideally, quantitative metrics associated with school climate and student achievement would demonstrate growth within schools across the county over the next three to five years.
3. The podcasts themselves will yield qualitative data that aim to enhance instruction within the leadership preparations program and enhance

general understanding of inclusive practices of school leaders. Current students, upon completion of the program, will demonstrate growth in empathetic understanding and call to action around inclusive practices aimed to address students with varying abilities and those students coming from homes in impoverished areas.

3.) HOW DID THIS RESEARCH COME ABOUT?

Recognizing that the graduate students within the principal certification program at Millersville needed a more robust experience with understanding their leadership role with technology, we purposefully incorporated the International Society for Technology in Education (ISTE) standards for educational leaders (ISTE, 2020) within an existing course, EDSU 701: Administrative Aspects of Education. Students were given the task of developing a podcast that incorporated the ISTE standards with a focus on equity and inclusion, the underpinning mission and vision of the leadership program at this Institute of Higher Education. The group podcast project was implemented in a pilot phase during the teaching of a compressed version of the course in summer 2020.

Podcasts as learning tasks have proven to promote cognitive elaboration, enhance critical thinking and improve student performance (Lazzari, 2009). Bolliger and Amier (2013) considered students as podcast producers and their perceptions on their own learning. Podcasting has also empowered learners and showed how student-developed podcasts promote engagement and motivation for learning. They have improved cognitive learning and developed transferable team-working skills among student producers (Nie et al., 2008).

Preparations for the pilot phase of this study were funded through a grant from the Positive Energy Fund in 2020. Although the face-to-face instructional design of this course was essential for the group-work component of the project, all plans were quickly altered with the onset of the COVID-19 pandemic and the impact it had on instruction. Instructors for the

course were forced to modify the podcast project, making all aspects of its design and implementation fully remote; this created a challenge in the collaborative design of the intended group work.

4.) WHAT DO YOU HOPE WILL COME OF IT?

Our greatest hope is that all the graduate students who participate in this podcasting experience become inclusive-minded school leaders serving students in our local communities. Additionally, we are considering how the growing podcast library can be best utilized by students in the leadership program. Furthermore, we might hope to accumulate podcast episodes to be made available to a wider audience outside Millersville, impacting inclusivity in schools on a broader level.

5.) ARE THERE ANY STUDENTS COLLABORATING WITH YOU?

Students who are enrolled in graduate course EDSU 701: Administrative Supervision work in teams to develop the inclusive podcast. As instructors-researchers, we analyze the students' collaborative growth and learning as developing administrators as well as the podcasts that are produced.

6.) DO YOU HAVE ANYTHING ELSE YOU WOULD LIKE TO ADD OR SPEAK ABOUT ON THE TOPIC?

Inclusive K-12 schools can be achieved through effective visionary leadership which recognizes that the appropriate supports must be in place for full inclusion to be effective; these schools would employ leaders who champion the belief that all students should be included. This multi-tiered project promotes aspiring school leaders learning from current administrators and gives them more confidence in understanding the necessity for schools where all students belong. ♦

STUDENT/FACULTY COLLABORATION WITHIN THE CHEMISTRY DEPARTMENT



Written by: TJ Henry



Dr. Edward Rajaseelan

and in various industrial reactions. Dr. Rajaseelan collaborates with Dr. Daniel Albert in the chemistry department.

DR. EDWARD RAJASEELAN has been a valuable member of Millersville University's chemistry department for over 30 years. His research interests are in the areas of synthetic inorganic, bio-inorganic and organometallic chemistry. His research involves the synthesis and characterization of transition metal complexes consisting of nitrogen oxides, N-heterocyclic carbenes and chelating phosphines as ligands. These complexes have many potential uses as catalysts in green chemistry, organic synthesis

Using his knowledge of green chemistry, Dr. Rajaseelan is advising Honors College members **KASSANDRA CASTALDI** and **JOSHUA RUSHLOW** with their Honors College theses. Cassandra is currently a senior, and Joshua is a second-year junior. The main topic of their theses is the same, but the specifics of what they are doing are different. They are synthesizing green chemistry catalysts, which are mainly used in transfer hydrogenation reactions. Hydrogenation is commonly used in the industry, including in the synthesis of pharmaceuticals and vitamins, and utilizes hydrogen gas, which is flammable and explosive. The catalysts that Cassandra and Joshua will synthesize will transfer hydrogen from the solvent without the use of the dangerous hydrogen gas, making the process of synthesizing them much safer. Regarding their own separate research, they each made different, brand-new catalysts by carefully altering the features of the original catalysts and observing if the new ones work better in the reactions. Both Cassandra and Joshua have published part of



Kassandra Castaldi



Joshua Rushlow

their work as first authors in a referred international journal and will be presenting their work at the National Conference of the American Chemical Society in March 2022.

Kassandra and Joshua have both been very academically successful during their time at Millersville. Cassandra has been awarded the James E. Koken Science Scholarship, the APSCUF-MU Scholarship, the Excellence in Chemistry Scholarship, the Gerald S. Weiss Chemistry Scholarship, and the Neimeyer-Hodgson Student Research Grant. She has also won the Henry Bitner Science Prize and the American Chemical Society Undergraduate Award in Analytical Chemistry. She plans to do her graduate work in chemistry and has already received admission to Yale University.

Joshua has been awarded the Dr. R. Edward Rajaseelan Excellence in Chemistry Scholarship and the Murley Summer Undergraduate

Research Fellowship, where he was paid to work in a lab at Millersville for 10 weeks. He has also won the Millersville Freshman Chemistry Award, given to the top chemistry student in General Chemistry II.

When asked what the process of collaborating and doing research with a student looks like, Dr. Rajaseelan said that it is a requirement within the chemistry department, and that most students work on their research during their senior year, but some begin as early as their sophomore year. Joshua started doing research with Dr. Rajaseelan during the summer of his freshman year. Students work closely with Dr. Rajaseelan as he teaches them the techniques involved in the synthesis of these complexes and how to use the various instruments available to them in the labs. His goal is to give them the knowledge needed to succeed and guide them as they slowly become more and more independent in the lab.



Doing research with students has made an impact on Dr. Rajaseelan too. It keeps him interested and engaged in the field of chemistry, and it is constantly increasing his knowledge within the field. When it comes to students, collaborating with professors on research is valuable because it is important training for their future careers. Many students who have collaborated with professors within the department have gone on to excellent graduate programs. Part of the reason many students are able to achieve so much is because Dr. Rajaseelan assists students with setting ambitious goals that match the potential he sees in them. He says that the students he works with are very bright and hardworking, which further increases his passion for his field.

Dr. Rajaseelan added that student research is very important, and that many professors greatly enjoy collaborating with students on research because it challenges them and makes them more intellectually curious. He says that the most important goal professors have for students is that the time they spend at Millersville is rewarding for them and sets them up to have successful careers and fulfilling lives. ♦



ENGAGE FOR CHANGE JOURNAL: MILLERSVILLE'S NEWEST ACADEMIC JOURNAL



Millersville University. It is specifically focused on Lancaster County and the surrounding area. The journal strives to identify relevant public issues affecting the community; explore these issues through research and discussion; provide an outlet for community members to present their research and share their perspectives on issues; and highlight diverse voices from Millersville students and staff and members of the Lancaster community.

The journal is a peer-reviewed publication managed by coeditors Dr. Farkas and Tatiana and coordinated by the editorial

board, which consists of dedicated Millersville faculty and a team of student interns. Coeditors are responsible for determining whether submissions fall within the scope of the journal and are relevant to the annual theme of the journal. The team is also responsible for accepting submissions or returning them for edits before publication!

The *Engage for Change Journal* welcomes submissions from undergraduate and graduate students from all disciplines, faculty (full-time or part-time) from all disciplines, and community members. The journal is particularly interested in collaborative submissions (student-student, faculty-student, student-community member, faculty-community member, etc.) and submissions that connect to the Lancaster

County region. The journal welcomes six main types of submissions, which include articles focused on research; impact; common-ground dialogue and reflection; creativity; reviews; and perspectives. The inaugural spring 2022 issue is themed "Environmental Justice"; this topic was selected as the theme because it is not only an important issue, but Pennsylvania just marked its 50th anniversary of the Environmental Rights Amendment, which guarantees the right to clean air and water and the preservation of the environment. The theme for the second issue will be announced in the first, upcoming edition! The journal can be accessed here: www.engageforchangejournal.com.

A note from Dr. Farkas and Tatiana: "The hope for this new journal is to launch the first issue, learn from it and use it as the foundation to expand the dialogue on important issues affecting the community. Please check out the first issue when it comes out in the spring!" ♦

Written by Maddie Engleman



Dr. Kerrie Farkas

The *Engage for Change Journal*, founded by **DR. KERRIE FARKAS**, professor of writing studies and Writing Center coordinator, and coedited by **TATIANA PASHKOVA-BALKENHOL**, Undergraduate Research & Instruction Librarian, is the newest academic journal to join the Millersville family!



Tatiana Pashkova-Balkenhol

Dr. Farkas, who began working at the University in 2003, and Tatiana, who came to Millersville in 2014, are also coordinators of the *Made in Millersville Journal*.

The *Engage for Change Journal* is a community journal affiliated with



STUDENT RESEARCH RECOGNITION

Collected by Maddie Engleman and TJ Henry

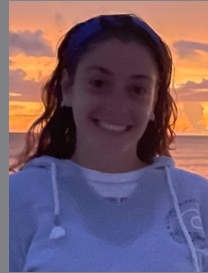


JONATHAN WILKINS '21, University Honors College, computer science major and mathematics minor, is completing his thesis on "Solving Nonograms with Constraint Satisfaction." He is working

with Dr. Chris Cain to test different methods for solving nonogram puzzles efficiently. He plans to hold his thesis defense in spring 2022! ♦

LEAH FREEMAN '21, University Honors College, majored in English with a writing studies concentration, and minored in ESL linguistics and psychology. For her honors thesis, she completed a creative project by writing a novella! She completed back-

ground research into feminism and feminist fiction and then moved forward with the project by writing and completing the novella. She was inspired by and utilized what she learned from the research. Even though Leah did not know her thesis advisor, Dr. Emily Baldys, well, it turns out that they have similar interests, and their connection worked! Leah shared that it might seem scary to select a thesis advisor and committee, but it is worth it. She submitted abstracts to two conferences for presentation of her novella, and both



were accepted: 2022 National Conference on Undergraduate Research and Spring '22 Annual Meeting of the Northeast Regional Honors Conference. ♦



VICTORIA PERONI '23, University Honors College, psychology major and sociology minor, is exploring synesthesia for her thesis. She aims to validate self-reports of the condition with a test measure.

Students at MU will complete surveys about synesthesia, and then they will take a synesthesia test on a phone app to see if their thoughts match their actual score. Victoria is working with Dr. Shawn Gallagher in the psychology department, and they just received IRB protocol approval for her study. Victoria is very excited about her research and cannot wait to proceed. ♦



STUDENT RESEARCH RECOGNITION



CHRISTA GUMBRAVICH '22, University Honors College, is an English major with a writing studies concentration, and speech communication with the theatre option. As Christa's thesis is creatively driven, she wrote and directed a show entitled *The Anxiety of Love* with the help of her thesis advisor, Dr. Jonathan Strayer. She was awarded the Wickersham-Burrowes Award to help produce the show! Christa's show was presented live during fall semester on December 3 and 4

in Dutcher Hall. She will also be presenting her work this spring semester at Made in Millersville! ♦



LAUREL BLANCHARD '22, University Honors College, is a meteorology major, concentrating in broadcasting, with minors in mathematics and emergency management. Her thesis is analyzing the expectations of meteorologists, news directors and general news managers on weather reels of potential candidates for a broadcast meteorology position and will evaluate how the hiring process has changed over time. Weather reels in the field of

broadcast meteorology are essential to be considered for an open position to show the skills and the versatility of the candidate. News directors and general news managers each view weather reels differently than meteorologists and have different opinions on the order and structure of the reel. Since there has been very little record of how the hiring process of broadcast meteorologists has changed over time, Laurel is excited to dive into her project under the direction of her thesis advisor, Dr. Sepi Yalda. ♦



KATHERINE PHEYSEY '23, University Honors College, is a dual major in mathematics and language and culture studies, with concentrations in statistics and German language studies, respectively. Her thesis focuses on using methods of imputation on a variable with categorical data in a public CDC COVID-19 dataset. Through these methods, missing values are estimated so that more values can be used in analyses on this dataset. The methods used could apply

to other variables in the dataset with MAR (Missing At Random) data. Overseeing this research is Dr. James Fenwick; Katherine's thesis defense will likely be held in spring 2022. ♦



JEREMIAH SHILLINGBURG '22, University Honors College, majors in technology and engineering education. Jeremiah's thesis aims to create a curriculum for a high school course on bio-related technologies. He says that bio-related technology is a crucial part of technology education, yet it is often left out of high school programs. This project seeks to give high school teachers resources in order to help meet this need. Jeremiah's thesis advisor is Dr. Sharon Brusic. ♦

NEWSLETTER STUDENT STAFF



**Student Editor/Writer:
Maddie Engleman**

MADDIE ENGLEMAN is a junior at Millersville University. She recently changed her course of study and is now pursuing a BSE in early childhood education and minoring in English with a concentration in writing studies. In her free time, she enjoys reading psychological thrillers, crafting,

cooking and working at KinderCare with her kindergarten class! Maddie is a student in the University's Honors College and is a mentor for incoming honors freshmen. She is also a writer for the Honors Report and Millersville's chapter of Her Campus, and works in the Writing Center as a tutor. This is her second and, sadly, last semester as a student coeditor of the University Research Newsletter. In closing, she says she has "loved writing for this publication and will miss not only the publication itself, but connecting with people across disciplines to highlight their research." ♦



Student Editor/Writer: TJ Henry

TJ HENRY is a junior at Millersville University, currently pursuing a BSE in secondary English education. In his free time, he enjoys listening to music (especially Taylor Swift), writing poetry and reading. He is a member of the University Honors College as well as an office assistant for the Department of Communication and Theatre. This is his first semester as a student coeditor of

the *University Research Newsletter*. ♦

As this is the final edition of the University Research Newsletter, our team of writers and editors would like to express our appreciation to the contributors and readers of this publication. It has been an honor over the past 12 years to discover and highlight research from all corners of our institution. THANK YOU to the editors and writers, as well as the administrators, faculty, and students, who shared their ideas and research outcomes. The scholarly activity that has been presented here is one important facet of MU that helps make our institution uniquely EPPiIC.



Millersville University

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