



# Grants and Sponsored Projects

Funding Year in Review

July 1, 2018 - June 30, 2019



*“If given another opportunity, I would definitely get involved in research again. In fact, I will continue working on the KU BEARS summer research project in the fall. I realized how much I matured in both academic background and laboratory skills after engaging in a research project.”*

**-Huong Tran, KU BEARS Student**

*“I would participate in research again if given the opportunity. By participating in research as an undergrad I am fortunate enough to have the opportunity to gain hands-on experience that will prepare me for my future professional endeavors involving researching. Continuing to do research will not only contribute to my professional development but will improve my academic skill-sets as a student.*

**-Carolyn Rene, KU BEARS Student**

## Kutztown University Bringing Experiences About Research in Summer (KU BEARS)

The purpose of the KU BEARS program is to support faculty/student research pairs over the summer. The goals are twofold: to develop the necessary skill set of undergraduate students to help them become student researchers and to provide faculty members with paid student research assistants. Undergraduate students selected for the program will receive summer pay and free housing for research tasks assigned by a faculty supervisor. By assisting faculty members in their research, students selected for the program will learn the knowledge and skills necessary for conducting advanced research in their field.



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### Angelika Antoni

College of Liberal Arts and Sciences | Biological Sciences

### Andrew Muscara

Major: Biology - Allied Health

### Immunofluorescence Microscopy Study of Autoimmune and Normal Immune Cells

**Amount Awarded:** \$2,000

**Overview:** Autoimmunity in mammals is the result of a failure of the immune system to differentiate between normal, self-proteins or cells, and pathogenic threats. It is the role of macrophages and dendritic cells to identify and begin the immune response to pathogens; but macrophages, in addition, must clean-up normal cell debris without triggering an attack response. Dr. Antoni and her collaborators have proposed that the misreading of normal debris by macrophages could lead the cells to initiate an attack against normal proteins. They identified key communication pathways in macrophage cells which are abnormal in all nine tested strains of mice that develop autoimmunity, and none of the thirteen normal strains of mice tested. It is important to find the one or more genes misbehaving in the critical pathways. One gene, RhoA was found to be abnormally regulated, but not mutated, so the group is searching for another gene whose protein can regulate RhoA. The student completed research on one possible gene (PEBP), but he determined by gene expression analysis that it was not involved autoimmunity. He then focused on a second possible gene, RhoH, and found by gene expression analysis that multiple forms (never previously reported) of the gene are expressed in the macrophage cells. The protein also was found to be expressed in multiple forms and the expression pattern in autoimmune cells was different from that in normal cells – indicating RhoH could very well be a key component of abnormal signaling in autoimmune animals.

*“The lab techniques and use of new equipment allowed me the chance to better understand the field of study I am in and what I should expect after graduating.”*

*-Andrew Muscara*

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## Angela Cirucci

College of Visual & Performing Arts | Communication Studies

## Megan Weiss

Major: Social Media Theory and Strategy

### Exploring Social Media Apps as Places and Spaces

**Amount Awarded:** \$2,000

**Overview:** Specifically attempting to answer “How do ethnographic and qualitative methods allow us to study social media apps?” this project employs methods traditionally used in Social Work and Geography Studies to investigate social media app (SMA) users as inhabitants. Users view their posts and interactions on SMAs through their social value—gaining attention, supporting friends, and connecting with family. However, backend logics that focus on institutional value—collecting, manipulating, repurposing, and disseminating data—are not known or understood by most users. In turn, studying these processes from a user viewpoint, or even asking users about their experiences with these processes, is nearly impossible through traditional media studies methods. This pilot study tests our newly adopted and adapted methods of “subjective sketches” and “structured app walks,” with the expectation of leading to better conceptions of social and institutional life. Like physical structures, users move through SMAs guided by design choices and cultural norms. SMAs may just be spaces—meaningless and context free. For many, however, they have transformed into places—socially constructed and material, holding memories and emotions. Initial findings indicate that age proves to be an important factor. Participants under 35 were more likely to view SMAs as places. Yet, actual knowledge of backend processes was consistently low across the entire sample. This finding, among others, led us to conclude that young adults experience a type of “pseudo-place” that is designed to make users feel comfortable and share valuable data even though they may not know the SMA as well as they think.

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## Michael Davis

College of Liberal Arts and Sciences | Geography

## Codi Rhodes

Major: Geography

### Variability in American Late-Spring Transitional Temperatures

**Amount Awarded:** \$2,000

**Overview:** Temperature transitions during the late-spring period, defined as April to May, have experienced greater extreme shifts. Locations within the United States have observed freezing temperatures, temperatures below 32°F, in April give way to intense heat, such as 90°F days, in May. Extreme shifts in temperature over a short temporal period have been predicted by climate modeling experiments due to anthropogenic activities. This quick transition has created a colloquial proverb of “the week of spring” in meteorological and public arenas. This project aims to assess the spatial properties and quantitative relationships over more than a century of spring temperature data within the United States. By analyzing this data, additional climate information can be gathered to assess this critical transitional period within the annual climate regime.

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(Michael Davis continued)

The spring season corresponds to numerous facets of American society. Switching between heating and cooling can have economic and comfort impacts on Americans. The spring time is critical to the cultivation and germination of some crops leading to potential agricultural losses. Furthermore, extreme shifts in spring temperature can disrupt ecological systems that impact the behaviors of flora and fauna. Large swings in temperature can result in earlier snow melt which impacts hydrological balances on local and regional scales. Understanding the vulnerability to rapid, extreme temperature changes is essential to community adaptation and resiliency.

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## **Kaoutar El Mounadi**

College of Liberal Arts and Sciences | Biological Sciences

## **Christopher Gauntner**

Major: Biology - Organismal Ecology

### **Determining the Mechanisms of Antifungal Activity of Peppermint Oil against the Fungal Plant Pathogen *Alternaria Solani***

**Amount Awarded:** \$2,000



**Overview:** Early blight is one of the most important diseases of tomato. It is caused by the fungal pathogen *Alternaria solani*. The disease is hard to prevent and leads to significant yield losses. Chemical fungicides remain the only way to control it. Nonetheless, their excessive use has led to the appearance of more aggressive strains of *A. solani* in addition to various environmental and health issues. There is therefore an urgent need to find safe and durable alternatives to control early blight. We have previously tested the ability of several essential oils to inhibit the growth of *A. solani in vitro* and control early blight disease in tomato plants. Peppermint oil provided strong resistant to *A. solani* and the plants treated with this oil did not develop early blight disease symptoms. In this project we aimed to study how peppermint oil inhibits the growth of *A. solani*. Data showed that peppermint oil has a fungistatic effect on *A. solani* up until a concentration of 0.3% when it becomes fungicidal. Although a fungicidal effect is more of a permanent control solution but in most cases, it causes the pathogen to develop resistance which will render the control ineffective eventually. When looking at hyphae using scanning electron microscopy and light microscopy, there was no apparent effect of the oil on hyphal morphology. Findings from this project are important in order to fully harness the potential use of peppermint oil as an alternative to chemical fungicides in the control of early blight disease.




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## Richard Heineman

College of Liberal Arts and Sciences | Biological Sciences

## Cole Matrishin

Major: Biology - Organismal Ecology

### Evolution of a Virus Under Conditions of Direct Competition

**Amount Awarded:** \$2,000

**Overview:** Biofilms, in which bacteria grow on a surface, are important ecologically and also impact human health. Bacteriophages, viruses that infect bacteria, have typically been studied in well-mixed liquid culture. However, in many cases these viruses are found in conditions that cause them to preferentially infect hosts that are nearby, such as biofilms. This may then change the selective pressures that act on them, causing them to change and potentially interact with cells in a biofilm differently. We investigated T7 bacteriophage, which infects the bacterium *Escherichia coli*, and its adaptation to grow on cells on the flat surface of a Petri dish. We found that the viruses evolved a number of genetic changes, most of which had also been seen in adaptations to the same host strain in liquid culture. Most of these changes were present in the genomes of almost all individuals, suggesting there was no strong selection for variation. The attachment rate, which theory suggests may have been under selection for lower chances to attach to cells, did not change. Further evolution may allow new mutations that are not universally advantageous on the host to spread.




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## Alexander Hernandez

College of Liberal Arts and Sciences | Biological Sciences

## Christine Holland

Major: Biology - Pre-Medicine

### Assessing Nematode Parasite Prevalence in Organic Pig Farm Enclosures

**Amount Awarded:** \$2,000

**Overview:** Little information exists about the incidence of parasitic worm infection in organic swine production in the United States, although extensive research about the basic biology of parasites in organic farms has been done in Europe. Thus, a goal of this project is to examine the relative abundance of parasites on an organic farm by quantifying the number of infective egg stages that worms inside pigs produce and spread in the environment when pigs defecate. This project focused on quantifying eggs of 3 intestinal roundworms, *Ascaris suum*, *Trichuris suis* and *Oesophagostomum* sp., which commonly infect pigs. Soil, bedding inside the pigs' pens, and pig feces were collected at the organic swine facility of Rodale Institute in Kutztown, Pennsylvania. The percent of samples positive for each species of egg, and the abundance of eggs in samples was assessed weekly from feces, and bi-weekly from bedding and soil over the May and August 2019. Results show variability in the number of eggs produced by worms of each species over time, and differences in infection between pigs of different age and sex. Bedding samples showed differences between dirty and clean areas of the pigs' pens. Soil samples yielded less conclusive results about how common the infective parasite eggs are in that environment. These results will be compared to that of other farms in Pennsylvania, Iowa, Wisconsin and Minnesota where organic farming of pigs is an important component of their agricultural economy.




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## Michael Johnston

College of Visual & Performing Arts | Cinema, Television and Media Production

## Joshua Beltran Del Rio

Major: Cinema, Television and Media Production / Applied Digital Arts

### Short Film: *For Sale Larrie*

**Amount Awarded:** \$2,000

**Overview:** Most films start with a screenplay. The screenplay provides a narrative structure, action and dialogue, and clear objectives from scene to scene. The screenplay also provides the details necessary to budget, schedule, and determine the film's aesthetic. But the security provided by a screenplay can also inhibit the creative process of the director and actors.

CTM student, Joshua Beltran Del Rio, and CTM professor, Michael Johnston, worked in contrast to this traditional, screenplay-driven filmmaking practice. Similar to the processes of filmmakers, Rick Alverson, and John Cassavetes, we developed a short character-driven film through improvisation with the film's principal actors and designed a conceptual approach to the film's visual language not dependent upon continuity for post-production. A screenplay was never written at any point in the process. This was a new method for professor and student. In rehearsals, we isolated beats and pivot points through dialogue and action as well as through extensive conversations with the actors. We determined the next set of directions and built the film's architecture through various experiments with language, tone, and silence.

Our approach continued through production. Our film crew, composed entirely of CTM students were free to experiment with the shot composition, lensing, and camera movement as a result of the actors' performances. The film's post-production will reveal the film's narrative as we edit the performances, dub new dialogue, and incorporate additional footage.

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## Matthew Junker and Christopher Sacchi

College of Liberal Arts and Sciences | Physical Sciences and Biological Sciences

## Megan O'Neill

Major: Biochemistry



### Building an Algae Bioreactor to Reduce Atmospheric Carbon Dioxide

**Amount Awarded:** \$2,000

**Overview:** The earth's climate is warming rapidly due to high levels of atmospheric carbon dioxide from the combustion of fossil fuels. One potential way to reduce atmospheric carbon dioxide is to employ algae to convert carbon dioxide into algal biomass. Algae grow rapidly and, unlike terrestrial plants, do not require arable land. The goal of this project was to develop an economical and easy-to-use algal bioreactor that could be widely adopted for reducing atmospheric carbon

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(Matthew Junker & Christopher Sacchi continued)

dioxide. A method was developed for growing and quantifying algae under controlled conditions to enable optimization of different growth variables. The addition of nutrients was found to greatly enhance growth compared with spring water. This method is now being used to further optimize growth conditions in order to maximize the conversion of carbon dioxide into algae biomass.

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## Erin Kraal

College of Liberal Arts and Sciences | Physical Sciences

## Guliana Simmens

Major: Environmental Science - Chemistry / Secondary Education - Earth, Space Science

### Student Produced Audio Narratives

**Amount Awarded:** \$2,000

**Overview:** This two-year pilot program, funded by the National Science Foundation Improving Undergraduate STEM Education Program, implemented a curricular approach specifically focused on addressing the challenges of STEM introductory courses, such as large classes, minimal laboratory materials/access, and limited faculty support. Using Student Produced Audio Narratives (SPAN) assignments students engage with the geosciences by telling a scientific story using simple audio recording and production techniques in their introductory course. The pilot program developed a collaborative regional network of eight faculty to design and implement student-produced audio narratives. Using a mixed method approach, the impact of student-produced audio narratives on students' engagement and the learning environment was evaluated.

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## Brian Kronenthal

College of Liberal Arts and Sciences | Mathematics

## Liannah Kim

Major: Mathematics / Computer Science

## Ethan Noe

Major: Mathematics

### Cycles in Algebraically Defined Graphs

**Amount Awarded:** \$2,000

**Overview:** In Combinatorics, graphs are objects commonly used to represent networks, communicate information, and solve problems. In this project, the students investigated special graphs which are called algebraically defined graphs.

Imagine an infinitely long row of vertices (imagine them as dots). Label each vertex with a different  $(x,y)$  coordinate pair, for instance  $(1,4)$ ,  $(3,1)$ , or  $(1/2,5)$ . Make a copy of the row so that you have two identical rows, one above the other. Now pick a vertex in the top row and a vertex in the bottom row. We will decide whether or not to draw an edge (picture a line segment) connecting them based on

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*(Brian Kronenthal continued)*

whether their (x,y)-coordinates satisfy a particular algebraic equation; that is why these graphs are called algebraically defined. Continue picking pairs of vertices (one from the top row and one from the bottom row) and deciding whether or not to draw an edge based on whether their (x,y)-coordinates satisfy the equation; repeat this process until every vertex in the top row has been considered with every vertex in the bottom row. The resulting object is an algebraically defined graph.

These special graphs are interesting in their own right, and problems in pure mathematics do not require a direct application; however, these graphs can be used to solve real-world problems, and have applications to coding theory, incidence geometry, and other areas of mathematics. There are infinitely many algebraically defined graphs, and only a small proportion have ever been investigated; the students and professor collaborated to prove new results about graphs that had never been studied. Their contributions were meaningful, and they are currently working to write a paper that will be submitted to a peer-reviewed mathematics journal.

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## **Eric Landquist**

College of Liberal Arts and Sciences | Mathematics

## **Isaac Reiter**

Major: Mathematics

## **Analyzing Playing Card Cryptosystems**

**Amount Awarded:** \$2,000

**Overview:** Spies and soldiers alike have used so-called hand ciphers throughout history to send secret messages using little equipment beyond a pencil and paper. Modern secure communication, by contrast, requires computer software and hardware to execute various cryptosystems. However, a routine calculation shows that the randomness (entropy) of a well-shuffled standard deck of playing cards has the potential to provide security to rival modern cryptosystems. Playing cards have the convenient feature that two suits have 26 cards, so the full deck can encode each uppercase and lowercase letter. For these reasons, Neal Stephenson, author of the novel *Cryptonomicon*, commissioned security expert Bruce Schneier to create a cryptosystem using playing cards. Since then, several other playing card ciphers have been designed.

We analyzed the security of Card-Chameleon and Chaocipher, two cryptosystems that are implemented using a deck of playing cards. We found new weaknesses in both cryptosystems and explored variations of these cryptosystems to help reduce these weaknesses. In the case of Card-Chameleon, we showed that a letter will encrypt to itself with probability  $1/13$ ; this probability would be  $1/26$  with a secure cryptosystem. This bias allowed us to demonstrate a practical crack of the cryptosystem when a message was encrypted multiple times with different deck shuffles. A couple techniques we explored to make these cryptosystems more secure were to implement jokers and also to implement “full deck” versions which utilize the full entropy of the deck in a way that the original versions do not.






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## **Khori Newlander**

College of Liberal Arts and Sciences | Anthropology & Sociology

## **Samantha Luskin**

Major: Anthropology

### **Documenting Work and Life at a 19<sup>th</sup>-Century Milling Village in Northeast Pennsylvania**

**Amount Awarded:** \$2,000

**Overview:** The rise of American industry during the late-18<sup>th</sup> and early-19<sup>th</sup> centuries dramatically transformed the United States. Historical accounts of this period of dramatic socioeconomic transformation commonly focus on the triumphs of famous people and the introduction of innovative technologies, leaving untold the stories of the ordinary men and women on whose backs these triumphs and innovations were achieved. This project seeks to tell the stories of the “invisible” men and women who lived and worked at Stoddartsville, a 19<sup>th</sup>-century milling village in northeast Pennsylvania. Previous archaeological research has established the links developed between Stoddartsville and the surrounding area as the town grew into a short-lived center of trade and industry in the region. During the summer of 2019, Samantha Luskin worked with Dr. Newlander to analyze artifacts recovered from the Stoddart mansion and workers’ cabins in order to document how transformations in the American industrial landscape affected work, as well as domestic life, for the countless men and women who were the real engines of industrialization.




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## **Paul Quinn**

College of Liberal Arts and Sciences | Physical Sciences

## **Ana Ozorio**

Major: Physics - Engineering

### **Temperature Dependent Characterization of Silicon Photovoltaic Cells Under Steady-State Simulated Solar Illumination**

**Amount Awarded:** \$2,000

**Overview:** The use of solar cells has continued to increase exponentially since their early incorporation into the space program. The overall worldwide capacity of photo-voltaic systems reached just under 305 gigawatts in 2016. While a promising green technology on earth to help reduce the consumption of fossil fuels, the extraction of solar energy from photo-voltaic cells in space-based applications is a necessity. Both terrestrial and space-based applications subject solar cells to large temperature variations. On earth, only a small portion of the electromagnetic energy from the sun, mostly in the visible spectrum, is used in the generation of electricity while the remainder is absorbed only as heat. In space-based applications, the lack of atmosphere exposes the solar cells to extreme thermal variations on a regular basis.

Previously, students investigated the performance characteristics of mono-crystalline, silicon, photovoltaic cells subjected to a high and low temperature thermal shock as compared to baseline measurements of the unaltered cells. In this

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study, we will investigate more thoroughly, the performance of these cells after exposure to cold temperatures, and attempt to model their behavior. In this study, we are able to observe the efficiency output of the photovoltaic cells in real time, allowing us to monitor changes in the performance characteristics of the cell while the temperature is changing. In particular, we will be examining effects to the open circuit voltage,  $V_{oc}$ , and the fill-fraction as a function of temperature and then attempt to model them with various simulations and solid-state theories. When designing solar energy systems, this information is helpful in predicting the performance of solar cells over the lifetime of the cell, rather than relying solely on the performance characteristics of a pristine cell.

Results showed that cooling the cells with liquid nitrogen for significant amounts of time permanently improved the performance of the cells at low temperatures. The  $V_{oc}$  of the photovoltaic cells increased when the cell was cooled at low temperatures for long periods of time. This led to an improved performance of the photovoltaic cells when tested at low temperatures. This improvement is a low temperature affect, that is not noticeable at room temperatures, but is significant for the use of solar cells, particularly in space, where temperatures can be as low as 4 K. This result could be modeled numerically as a function of temperature, using certain known characteristics of the photovoltaic cells, such as the gap energy and the ideality factor.

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## **Phillip Reed**

College of Liberal Arts and Sciences | Physical Sciences

## **Eric Fischer**

Major: Physics

### **Indirect Imaging of Variable Disks Around Stars and Mass-Transfer Streams Between Stars**

**Amount Awarded:** \$2,000

**Overview:** The 0.6-meter optical telescope at the C. R. Chambliss Astronomical Observatory (CRCAO) on Kutztown University's campus was employed to study the binary stars U Coronae Borealis (U CrB) and RZ Cassiopeiae (RZ Cas). Both U CrB and RZ Cas are interacting binary stars, meaning that material flows via a mass-transfer stream from one star to the other in each system. RZ Cas is a direct-impact system in which gas strikes the mass-gaining star directly, whereas U CrB builds a variable accretion disk of gas around the star. Since CRCAO was under construction for the replacement of the observatory dome during much of the grant period (summer 2019), we initially analyzed data collected during the previous several semesters. Once the dome replacement was complete, we began planning new observations in order to characterize variations in the mass transfer dynamics and to provide baselines for preparing an observing proposal for the use of the Center for High Angular Resolution Astronomy (CHARA) array of telescopes at Mount Wilson in California. We also took some time to conduct observations of new exoplanet candidates in collaboration with NASA's Transiting Exoplanet Survey Satellite (TESS) mission. Results of this project were presented at the Pennsylvania State System of Higher Education (PASSHE) student research conference at Kutztown University in November 2019 and at the 235th meeting of the American Astronomical Society (AAS) in Honolulu, HI in January 2020. This project is on-going and further results will be presented at the 30th Central Pennsylvania Consortium (CPC) Astronomers' Meeting at Franklin and Marshall College in April 2020.






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## Christine Saidi

College of Liberal Arts and Sciences | History

## Cynthia Diaz

Major: English

### Family before Gender: Social History in Early East and Central Africa

**Amount Awarded:** \$2,000

**Overview:** This research project is based on the third year of African fieldwork for a National Endowment for the Humanities Grant. From June 7<sup>th</sup> to July 20<sup>th</sup>, 2018, Dr. Saidi was gathering linguistic, video, oral tradition, life history, ethnographic, art, and archival evidence for NEH research, *Expressions and Transformations of Gender, Family, and Status in Eastern and Central Africa, 500-1800 CE*. Summer, 2018, Dr. Saidi and colleagues spent two months collecting evidence in Malawi, Tanzania, and Mozambique. When she returned to KU in 2018, she had a great deal of research data. Last summer an undergraduate student transcribed oral tradition interviews, and edited video taken in the field. This summer Cynthia Diaz assisted Dr. Saidi in analyzing primary and secondary research which included ethnographic writings, oral traditions, art and older academic articles found in the archives in Africa. Ms. Diaz learned how to use primary forms of evidence and vocabularies to write history. From previous fieldwork, both for the NEH grant and other research trips to Africa, Dr. Saidi has been able to construct a linguistic database that covers over 72 Bantu languages and has vocabulary relating to gender and gender dynamics. The final aspect of this summer's work was to historicize the evidence so that it can be analyzed and added to the manuscript *Family before Gender: Social History in Early East Central Africa* to be published by Cambridge University Press (2021).




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## Carsten Sanders

College of Liberal Arts and Sciences | Physical Sciences

## Houg Tran

Major: Biochemistry

### Construction of Novel Binding Peptides for Heme and Metal

**Amount Awarded:** \$1,000

**Overview:** In this project, we engineered eight novel peptides each with a binding site for a heme compound and a metal (such as Fe, Cu, Zn) using DNA assembly techniques. The heme binding site for these peptides is based on the electron transfer protein cytochrome *c* and the heme compound need to be covalently attached by the biological catalyst cytochrome *c* heme lyase (CCHL) in a cellular environment. The metals are expected to interact and associate with the peptides *in vivo* or *in vitro* in the absence of a specific biological catalyst. In the summer 2019, we focused on the genetic construction of novel peptides with binding sites for heme and metal. In the fall 2019, we will coexpress these peptides with CCHL in a heterologous bacterial (*Escherichia coli*) host and purify them via affinity chromatography using an added amino-terminal tag (Strep-tag). Subsequently, we will analyze the purified novel binding peptides using several biochemical or biophysical techniques such as denaturing polyacrylamide gel electrophoresis, heme protein staining, UV/Vis spectrometry, and others.






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## Carsten Sanders

College of Liberal Arts and Sciences | Physical Sciences

## Reagin Carpenter

Major: Biochemistry

### Exchange of a Conserved Histidine (H193) in Yeast Cytochrome *c* Heme Lyase and Analysis of the Mutant Phenotypes

**Amount Awarded:** \$1,000

**Overview:** Cytochrome *c* heme lyase (CCHL) is an enzyme that catalyzes the thioether bond formation of heme *b* (iron protoporphyrin IX) compounds to cytochrome *c* protein precursors (apocytochromes *c*) to produce functional cytochromes (holocytochromes) *c*. In many eukaryotic organisms, holocytochrome *c* is located in the mitochondrion organelle, where it acts as an electron transport component. In humans, defined CCHL mutations are associated with the disease microphthalmia with linear skin defects (MLS). Nonetheless, the molecular mechanisms of CCHL how it binds its substrates (heme *b* and apocytochrome *c*) and ligates them together is yet poorly understood. Previously, we showed that a highly conserved histidine (H128, yeast model numbering) is critical for CCHL function. Here, we generated mutations of a second highly conserved histidine (H193) within CCHL. We expressed these mutants together with non-mutated yeast apocytochrome *c* in an *Escherichia coli* host. Our data confirmed the critical role of H128 in CCHL. No holocytochromes *c* is produced with either CCHL mutant H128G, H128A or H128C co-expressed. On the other hand, co-expression of yeast apocytochrome *c* with CCHL H193 mutant H193G, H193A or H193C led (in all three cases) to holocytochrome *c* formation, suggesting that H193, although highly conserved, is not directly involved in any necessary catalytic step of CCHL.




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## Dylan Schwesinger

College of Liberal Arts and Sciences | Computer Science & Information Technology

## Matthew Bartlett

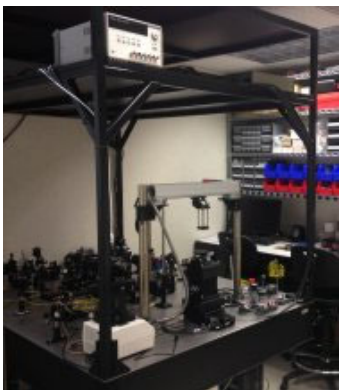
Major: Computer Science / Mathematics

### Long Term Map Maintenance for Mobile Robots

**Amount Awarded:** \$2,000

**Overview:** Mobile robot applications typically use a representation of the real-world environment (a map) for navigation tasks. The first step for many mobile robot applications is to create a map of the environment. That map is then used for future navigation tasks. This method assumes that the environment does not change over time; for some navigation tasks, this assumption is valid.

The goal of this project is to handle mobile robot navigation tasks where the environment is expected to change over time. For example, monitoring crop growth. The main aspect of this project is to investigate map representations that can be easily updated (repaired) when discrepancies are detected between the initial map representation and the sensor measurements of the real-world environment acquired during a navigation task.




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## Justin Smoyer

College of Liberal Arts and Sciences | Physical Sciences

## Erika Minnich

Major: Physics - Engineering

### Variations in the Thermal Boundary Conductance of Au-Si Interfaces During Accelerated Lifetime Testing

**Amount Awarded:** \$2,000

**Overview:** Computing is used in just about every aspect of life in today's society and is especially beneficial in today's society. However, a major roadblock in creating smaller and faster computers is the thermal management of the systems. This challenge has become increasingly prevalent as the electronics have decreased to nanoscale dimensions. The scientific community has developed many tools to determine the thermal properties of solid-solid interfaces within the past several years, however little thought has been given to integrating these technologies into real systems and how real-world scenarios would impact the results determined in a laboratory setting.

To better understand how thermal properties of solid-solid system can change over a device lifetime, the student and faculty research team will be merging classical physics techniques used to measure the thermal properties with that of an engineering approach of testing the system under accelerated lifetime testing. These results will not only determine the fundamental physics underlying thermal transport at a solid-solid interface but will also study the effects of thermal cycling on the stability of thermal properties across device lifetimes. This information will benefit both fundamental research and set the groundwork for the integration of research principles into engineering application.

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## Matthew Stone

College of Liberal Arts and Sciences | Biological Sciences

## Jessica Christ

Major: Environmental Science - Biology

## Olivia Crouthamel

Major: Biology

### Health Assessment of Nesting Diamondback Terrapins at Wallops Island Virginia using Hematological Techniques

**Amount Awarded:** \$2,000

**Overview:** The diamondback terrapin is a medium-sized turtle that is restricted to the coastal estuaries of the Atlantic and Gulf Coasts of the United States. Many populations of terrapins face a myriad of threats that can influence population viability (e.g. mortality with automobiles, drowning in crab pots, and loss of habitat). Some of these factors result in direct mortality; however, some anthropogenic disturbances/stressors may have sublethal effects on the health of individual terrapins. The goal of this study was to investigate potential sub-lethal health effects in a population of nesting diamondback terrapins on Wallops Island, a population



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we have been studying for many years. During summer 2019 we collected blood samples from nesting diamondback terrapins for the purpose of performing individual health assessments. In particular we focused on the abundance of hemoparasites. We collected a total of 65 nesting female diamondback terrapins and took a blood sample from a sub-set of these individuals. The results from this study will help us to better understand how terrapins are faring in the region and will provide a framework to identify the impacts of environmental or human-based factors on the health of terrapins.



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**Juliana Svistova**

College of Liberal Arts and Sciences | Social Work

**Carolyn Rene**

Major: Social Work / Political Science

**Understanding the Impact of Mutual Solidarity (MUSO) Microfinance Groups on Individual and Community Well-being in Rural Haiti**

**Amount Awarded:** \$2,000

**Overview:** In Haiti, the government's failure to adequately meet the needs of its citizens has fueled grassroots community organizing and the growth of the solidarity economy. This mixed methods research project investigates group processes and social impact of community-driven, solidarity-based microfinance groups in rural communities in Petit Goave, Haiti. Proposed outcomes of the project include evaluating the processes utilized by seven mutual solidarity groups in order to improve their programmatic effectiveness and identifying evidence-based best-practices in poverty alleviation efforts in the Haitian context. More generally, this research will contribute to the knowledge base on operations and social impacts of microfinance organizations on the well-being of participants and their communities.

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**Carol Watson**

College of Education | Elementary Education

**Jenna Plump**

Major: Middle Level Education (Math and Social Studies)

**James Durham**

Major: Middle Level Education (Science, Social Studies & Language Arts)

**Gender Bias in the Middle Level Classroom: The Intersection of Data, Teacher Self-Perceptions, and Student Perceptions.**

**Amount Awarded:** \$2,000

**Overview:** This study seeks to better understand instances of gender bias in middle level classroom practice, and particularly, to give voice to middle level students themselves. The existence of gender bias (and discrimination based on that

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bias) in public school classroom practice has been longitudinally well documented (Bellamy, 1994; Shmurak, Ratliff, & Shmurak, 1994; Sadker & Zittleman, 2009). The negative impact of gender bias on students and their learning is also well documented (Rodriguez-Planas & Nollenberger, 2018). Most of what we already know about gender bias in the classroom has been collected through the lens of adults. Few studies have mined the perspective of the students themselves (Feldman, 2002). Evidence suggests that including student voices significantly changes the conversation and provokes adults to think in ways they would not have had, had the student perspective not been included (Yonezawa & Jones, 2009). Methodology includes three distinct data sources: researcher observed classroom behaviors, teacher perspective, and student perspective. The latter two will be collected through a secure website. Benefits of this investigation include insight into exactly how students and teachers independently perceive gender bias, and what it looks like in classroom practice.

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### **Michele White**

College of Education | Elementary Education

### **Ian Petrillo**

Major: Elementary Education: 4-8 (Science and Social Studies)



## **Perceived versus Measured Achievement in the Middle Level Science Classroom: Impact of Socio-economic Status**

**Amount Awarded:** \$2,000

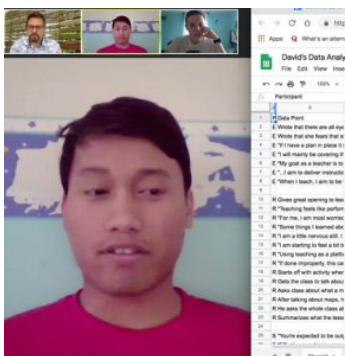
**Overview:** The range of challenges faced by students in low socio-economic contexts are well documented. Lack of support, differing cultural norms, poor nutrition, stress, and transiency are just a few. Add to this the of lack of adequate school funding, appropriate equipment, and quality instruction, and the chances for academic success of this demographic group seem even more unlikely. This investigation digs deeper into this situation through the eyes of the students themselves to better understand how the following 3 variables intersect specifically in the area of science: student attitudes toward the content area, self-efficacy toward the content area, and measured academic success through standardized assessments.

With these issues in mind, the guiding question for this investigation is:  
*How does SES influence students' perceived achievement versus measured achievement?*

*"Although our classes cover material to prepare us to be teachers, research allows us to dive deeper into the educational theories and methods of teaching."*

-Ian Petrillo





**Mark Wolfmeyer**

College of Education | Secondary Education

**Anna Nissley**

Major: Secondary Education (English)

**David Mohamad**

Major: Secondary Education (English)

## Is Teaching a Performance? Developing Effective Communication in the Classroom

**Amount Awarded: \$2,000**

**Overview:** Research on teacher education practices is an active field of inquiry, with recent studies detailing efforts in promoting teacher candidates' "core practices for teaching" (Allston et al, 2018) through sustained teaching, practice and discussion in teacher education coursework. Many of these studies apply theoretical conceptions and research-based practices in effective teaching to the teacher education setting, producing interventions in teacher education coursework that develop in teacher candidates the methods needed for effective teaching for all learners in public school settings. Most of these studied practices relate in some way to the Danielson (2013) Framework for Teacher Evaluation. This research study develops interventions in teacher education coursework that apply educational theory and practice on "teaching as performing" as it relates to core practices from the Danielson framework. Specifically, this analogic thinking will be studied as a means to develop teacher candidates' ability to deliver instruction effectively, such as "communicate effectively with students (Danielson Domain 3a)" and leading whole class discussions (Danielson Domain 3b). The extant literature on teaching as performing has not yet been applied specifically to teacher education interventions. Informed by the literature, this novel study includes a three-fold intervention: in-class discussions that unpack the analogy more carefully, practicing effective and inclusive communication using improv theater games, and demonstration lessons and leading of discussions by teacher candidates. Analysis of qualitative data, including teacher candidate reflection journals and recordings of demonstration lessons, determines the impact of these interventions. In particular, and as suggested by our conceptual framework, we are wondering whether direct exposure to the teacher as performer metaphor, and with a focus on improv, reinforces a "scripted" teacher that enacts a curriculum to reproduce social inequality through public education or teacher agents who flip the script, developing teacher/student agency and performativity as a means to increase equity goals for public education.

*"I have found research to be incredibly sustaining, challenging and rewarding. I could not have known this without an opportunity like KU BEARS and the help of Dr. Wolfmeyer."*

-Anna Nissley

## Kutztown University Research Committee Funding

The Kutztown University Research Committee provides funding to support research, scholarly activity and professional development. The maximum award is \$8,000.



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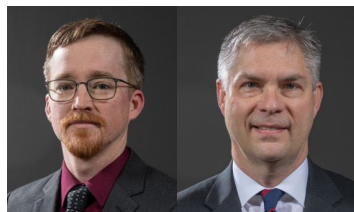
### Michele Baranczyk

College of Liberal Arts & Sciences | Psychology

#### Evaluation of a Wastewater Management PR Campaign

**Amount Awarded:** \$875

**Overview:** Using on-campus resident students of Kutztown University, we will evaluate the effectiveness of information regarding wastewater management. This study will use a quasi-experimental design with three conditions: control, posters only, and posters plus an information session. A pre-post design will be used to see if the posters or posters plus information session significantly changes students' knowledge, attitudes, and behaviors regarding wastewater management. These results can be presented to the Kutztown Borough to better evaluate the effectiveness of these materials in changing individual's behavior regarding wastewater management.



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### Colin Bolger

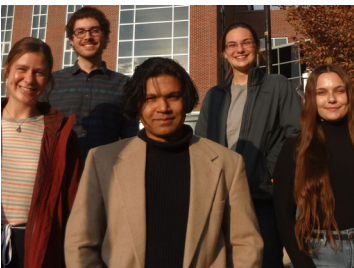
### Jonathan Kremser

College of Liberal Arts & Sciences | Criminal Justice

#### An Assessment of the Influence of Gun Carrying on College Campuses

**Amount Awarded:** \$2,000

**Overview:** Various state legislatures and universities have begun to allow students, faculty, and/or staff to carry firearms on campuses with the intention of reducing the chances of mass shooting incidents and other types of crime. The primary purpose of the project is to evaluate people's awareness of these policies, the number of people who actually carry weapons on campuses, and whether these policies have had an impact on fear of crime on college campuses.



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### Kunal Das

College of Liberal Arts & Sciences | Physical Sciences

#### Quantum Technologies with Ultracold Atoms in Ring Lattices

**Amount Awarded:** \$8,000

**Overview:** Harnessing quantum mechanics for new applications and devices is now generally accepted as critical for the development of future technology.

*continued*

(Kunal Das continued)

Ultracold atoms trapped in ring-shaped lattices offer the full spectrum of quantum effects relevant for such technology, yet it is a system that has barely been explored in practice. The purpose of this project is to thoroughly examine this system with a view to creating new quantum sensing, quantum simulations and information processing. The specific research will be computational and theoretical in nature, but will be applied to motivate and develop experiments in extramural collaborations, already initiated.

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**Yun Lu**

**Francis Vasko**

College of Liberal Arts & Sciences | Mathematics

### **Robust Solution Procedures for the Generalized Assignment Problem**

**Amount Awarded:** \$7,960

**Overview:** The generalized assignment problem (GAP) determines the minimum cost assignment of  $n$  jobs to  $m$  agents such that each job is assigned to exactly one agent subject to capacity restrictions on the agents. The GAP is a computationally complex (NP-hard) combinatorial optimization problem with many real-world applications including resource scheduling, storage space allocation, assigning software development tasks to programmers, and scheduling variable length television commercials into time slots. Exact solution methods for the GAP that guarantee optimal (the best) solutions can require excessive computer resources for large-scale GAPs. In this project, we plan to develop robust solution procedure(s) for GAP(s) that generate near-optimal solutions quickly and efficiently and are also relatively simple for operations research practitioners to implement.



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**Dale Parson**

College of Liberal Arts & Sciences | Computer Science & Information Technology

### **High Resolution Image Capture for Creating Digital Paintbrushes**

**Amount Awarded:** \$6,768

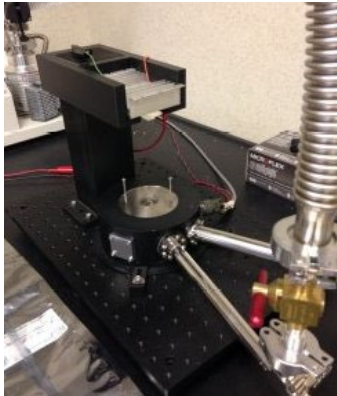
**Overview:** The PI is conducting research into using pixel-based (a.k.a. raster) digital images as paintbrushes with which to create still visual compositions and animated videos using computer algorithms also created by the PI. The proposal requests a modern, high resolution digital camera and lenses with which to capture image data in formats and detail not possible with the current equipment. Inventing new algorithms and digital painting techniques rely on using such higher resolution equipment.



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**Paul Quinn  
Justin Smoyer**

College of Liberal Arts & Sciences | Physical Sciences

**Enhance Performance Characteristics of Photo-Voltaic Cells Exposed to Temperature Variations**

**Amount Awarded:** \$7,880

**Overview:** The use of solar cells has continued to increase at a nearly exponential rate since their early incorporation in the space program. The overall worldwide capacity of photo-voltaic systems reached 303 gigawatts in 2016 (up 75 gigawatts from the previous year). While a promising green technology on earth to help reduce the consumption of fossil fuels, the extraction of solar energy from photo-voltaic cells in space-based applications is a near necessity. Both terrestrial and space-based applications subject solar cells to large temperature variations. On earth, only a small portion of the electromagnetic energy from the sun, mostly in the visible spectrum, is used in the generation of electricity while the remainder is absorbed only as heat. In space-based applications the lack of atmosphere subjects the solar cells to extreme thermal variations on a regular basis.

In the Solar Research Lab at Kutztown University we have been investigating the performance characteristics of silicon photo-voltaic cells subjected to high and low temperature thermal exposure as compared to baseline measurements of the unaltered cells. To date, results from the research conducted point towards alteration of the photo-voltaic structure at both temperature extremes. However, these variations appear to be driven by different mechanisms. To understand these results fully, a more in-depth investigation must be undertaken at both temperature regimes. The proposed project will utilize a bifurcated approach to study the same photo-voltaic performance metrics at both temperature regimes.

The results to date show evidence of a permanent alteration to the solid-state structure of the cell and to its electrical properties. The focus of the research moving forward will be to expand and analyze these results, in both temperature regimes, in order to elicit an explanation of the mechanism driving the observable changes. An in-depth understanding of these mechanisms would provide potential to optimize the structural changes for maximum photo-voltaic performance and the potential to realize the increased performance across a larger temperature range.

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**Maria Sanelli**

College of Liberal Arts & Sciences | History

**Social Activism: Cross Cultural Feminist Conversations**

**Amount Awarded:** \$8,000

**Overview:** After achieving international visibility by coming together to resist nationalist movements in different parts of the world, modern feminists have spent the last few years waging online debates in a variety of publications and social media forums. Intergenerational and multicultural conversations are taking place online but there has been little academic and/or cross-cultural research on the subject. This proposal is written to receive research support to study cross-cultural,

*continued*



(Maria Sanelli continued)

intersectional and generational issues that are at the forefront of current 4<sup>th</sup> wave feminist debates by interviewing second, third, and fourth wave feminists in both the United States and Great Britain. This summer is an especially good time to interview UK feminists during the 100<sup>th</sup> anniversary of women's right to vote event and in anticipation of sharing this research before the USA 100<sup>th</sup> anniversary of women's suffrage in 2020.

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## Edward Simpson

College of Liberal Arts & Sciences | Physical Sciences



### **Inverted Topography in Early Cretaceous Ruby Ranch Member, Cedar Mountain Formation, Unraveling Processes in a Preserved Fluvial System with Application to Unraveling Salt Dome Tectonics**

**Amount Awarded:** \$8,000

**Overview:** A series of small buttes, north of Moab, Utah are capped by Early Cretaceous river channels and provide an opportunity to employ Structure from Motion (Sfm) to construct three-dimensional models of these ancient river systems. UAV gleaned photographs are the data that is manipulated in Sfm software (PhotoScanPro) that generates the 3-D model of the geographic feature and associated rock features. Sfm models can have sub-centimeter resolution of various sedimentary features composing the preserved fluvial system permitting comparison with modern and ancient fluvial systems greatly improving these models. The water flow of fluvial systems north of Moab show a reversal of flow from east to west and west to east indicating a sudden shift in paleo slope related to the movement of salt in the sub surface. This extends the salt movement from the Triassic (200 million years ago) to the Early Cretaceous (120 million years ago).

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## Juliana Svistova

College of Liberal Arts & Sciences | Social Work



### **Understanding the Impacts of Mutual Solidarity (MUSO) Microfinance Groups on Community Wellbeing in Rural Haiti**

**Amount Awarded:** \$8,000

**Overview:** A mixed methods research project is proposed to investigate the social impact of solidarity-based microfinance organizations in rural communities in Petit Goave, Haiti. Funding will support the training of local researchers, data collection and analysis. Proposed outcomes of the project include evaluating the processes utilized by 8 mutual solidarity groups in order to improve their programmatic effectiveness and identifying evidence-based best-practices in poverty alleviation efforts in the Haitian context. More generally, this research will contribute to the knowledge base on social impacts of microfinance organizations on the well-being of participants and their communities.

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## Todd Underwood

College of Liberal Arts & Sciences | Biological Sciences



### The Effectiveness of Predator Guards on Songbird Nest Success

**Amount Awarded:** \$8,000

**Overview:** Artificial nest boxes boost nesting habitat for songbirds. However, boxes may be more vulnerable to predation than natural cavities because predators can learn their location and regularly visit them. Because of this, predator guards are used to limit predation but little research has examined their effectiveness. One observational study found that predator guards increased nest success, but was confounded by uncontrolled variation in box design and local habitat. Thus, a carefully controlled experiment is needed to confirm these trends. In this study, Dr. Underwood will experimentally test the effectiveness of two types of predator guards and will use trail cameras to determine which predators are thwarted from assessing nests by each type of guard.

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## Gwendolyn Yoppolo

College of Visual & Performing Arts | Art Education



### The Poetics of Color Development in Ceramic Raw Materials: Color Shifting and Fluorescence Using Lanthanide Oxides

**Amount Awarded:** \$7,999

**Overview:** Incorporated into ceramic glazes, slips, and clay bodies, the Lanthanide family of elements produces intriguing color shifting and fluorescent effects, depending on the light source illuminating them. This research will explore and document these effects in a series of tests that explore colorant combinations, various base recipes with different surface qualities, variables related to the firing conditions of the pieces, and the effects of different forms of lighting on fired samples. Work will focus on developing innovative testing procedures that are at once grounded in scientific reasoning while also being guided by aesthetic concerns and an intuitive approach. Cohesive palettes of colors that shift in response to different lighting sources will be developed for use in artistic production. Ceramic art produced using these colorants can stretch the boundaries of human perception, opening our minds to our limitations and questioning our usual mode of understanding our world.





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## Ju Zhou

College of Liberal Arts & Sciences | Mathematics

### Perfect Matching Transitive Graphs

**Amount Awarded:** \$6,768

**Overview:** Graph Theory is the study of graphs, which are mathematical structures used to model pairwise relations between objects from a certain collection. It can be used to solve problems in many fields which include physics, biology, chemistry, computer science, sociology, and operations research.

The objective would be to provide support for scholarly activities with a collaborator and KU undergraduate students on characterization of perfect matching transitivity of several families of graphs. During Spring 2017, Dr. Ju Zhou found the existence of perfect matching transitive graphs while she was working on induced matching extensive graphs. Its importance and significance quickly got the recognition of the researchers in related fields. In the proposed research period, the investigator and her collaborator (possibly with students from both sides) will work on the perfect matching transitivity of symmetric graphs, circulant graphs and Cayley graphs, respectively.

*"To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science."*

-Albert Einstein

## Kutztown University Research Committee Facts

The Research Committee awarded \$80,250 in grants to 15 faculty members (12 awards). Research was funded in the following disciplines: psychology, criminal justice, mathematics, social work, computer science, history, art education & crafts, biology, geology, and physics.

	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
<b>Received</b>	28	21	26	14	15	13
<b>Awarded</b>	20	12	17	12	11	12
<b>Total Requested</b>	\$ 144,454	\$ 111,044	\$ 137,654	\$ 89,668	\$ 95,682	\$ 80,394
<b>Total Awarded<sup>1</sup></b>	\$ 87,236	\$ 64,079	\$ 96,976	\$ 78,235	\$ 60,978	\$ 80,250
<b>Annual Funding Available</b>	\$ 75,783	\$ 75,783	\$ 75,783	\$ 75,783	\$ 75,783	\$ 75,783

1. Total Awarded may exceed Annual Funding Available due to the return of grant funding not expended from prior awards.

## Kutztown University Undergraduate Research Committee Funding

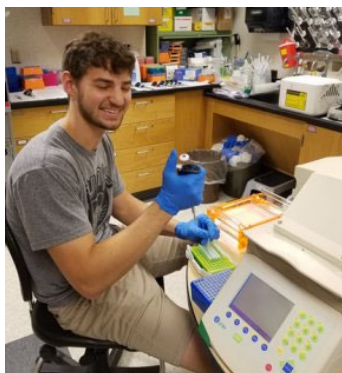
The Undergraduate Research Committee primarily supports laboratory or field research, as well as research projects in the arts, humanities, and computer science. Funding is available for undergraduate students who plan to conduct research and/or present their research at conferences or research symposiums. The committee awarded 54 students funding, for a total of \$36,271.

	SUBCOMMITTEES		TOTAL
	Science	Arts & Humanities	
<b>Awarded</b>	39	15	54
<b>Total Awarded</b>	\$ 30,167	\$ 6,104	\$ 36,271





## **EXTERNAL FUNDING**



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### **Angelika Antoni**

College of Liberal Arts & Sciences | Biological Sciences

#### **The Role of Phosphatidylethanolamine Binding Protein 1 in Autoimmunity**

**Funding Source:** Pennsylvania State System of Higher Education

**Amount Awarded:** \$9,834

**Overview:** The immune system must clean-up dead cells and respond correctly to threats. Cells that die by natural causes (apoptosis) do not pose a threat and thus lead to very different responses from the immune system than cells killed by pathogenic organisms (necrosis). If the immune system makes a mistake and misreads apoptotic cells as necrotic cells, the result is autoimmunity. Any attempt to prevent autoimmunity requires a thorough understanding of the molecular signaling interactions that differentiate between apoptotic and necrotic cells. Unfortunately, the mechanisms of differentiation remain a mystery. The aim of this research proposal is to test a promising protein identified by undergraduate students to identify its potential role in this process. The protein is Phosphatidylethanolamine Binding Protein 1 (PEBPI). It is known to regulate key activation pathways in cells, but we have preliminary evidence that it may serve a previously unidentified role: distinguishing between apoptotic and necrotic cells.



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### **Mario Cardozo**

College of Liberal Arts & Sciences | Geography

#### **Brazilian-Paraguayan Small-Scale Farming and Interethnic Conflicts in Paraguay**

**Funding Source:** Pennsylvania State System of Higher Education

**Amount Awarded:** \$7,442

**Overview:** In Paraguay, there has been a surge in soybean production in the last few decades linked to Brazilian entrepreneurs. Paraguayan small-scale (peasant) farmers have organized protests against soy planters and policies that favor foreign-controlled agriculture. Interethnic conflicts in the countryside have become increasingly violent. With the present project, Dr. Cardozo will investigate such land-use conflicts in a study area within a conservation reserve near Brazil. Soy expansion in the area has generated conflicts that involve diverse culture groups. The focus of the project is on a marginalized, largely understudied group, Brasiguayo (Brazilian-Paraguayan) small-scale farmers. Brasiguayos are ethnically-Brazilian Paraguayans; they are often considered to be linked to wealthy Brazilian soy croppers. Many Brasiguayos, however, are part of peasant communities. Dr. Cardozo will investigate how Brasiguayo peasants relate socioeconomically to other culture groups in the study area in order to propose strategies conducive to peaceful and socially-just sustainable development. This project contextualizes local interethnic relationships within relevant national discourses based on analyses of related news media articles, local academic reports, and social media posts.



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## **Moira Conway**

College of Liberal Arts and Sciences | Geography

### **Multi-Modal Interactions on Urban Streets: New Conflicts and Emerging Challenges in Mixed-Use Neighborhoods**

**Funding Source:** American Association of Geographers

**Amount Awarded:** \$500

**Overview:** This project seeks to examine the interaction gentrification and sustainable transportation development in Williamsburg, Brooklyn. Gentrification in Williamsburg has brought a changing residential population to the neighborhood. Despite this and despite the city's overall movement to a post-industrial economy, Williamsburg remains one of New York's industrial centers, with manufacturing, warehousing and distribution. These new mixed-use areas present a challenge for transportation planning. Through mapping and spatial analysis of socioeconomic characteristics and transportation activity, this project aims to characterize the changing conditions for multi-modal transportation in a mixed residential-industrial area, to identify specific conflict areas in terms of both land use and infrastructure, and to provide recommendations for improving street design and regulation to balance these incompatible uses. Williamsburg is then compared to two more recently gentrifying neighborhoods in New York City, Long Island City and Bedford Stuyvesant.



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## **Helen Cooper**

College of Visual & Performing Arts | Art Education

### **Piezography Training: A New Digital Advantage for Photography in the Department of Art and Art History**

**Funding Source:** Kutztown University Foundation

**Amount Awarded:** \$3,925

**Overview:** This grant seeks coverage for the cost of training in Piezography at Cone Editions Studio as well as the start-up material that will allow the Department of Art to offer this technique to students. Cone Editions Studio is on the vanguard of innovation in inkjet printing processes. They are well known for developing a unique black and white inkjet process called Piezography, which is a high-end image making technique that rivals analogue process in rich tonal values. Expertise in Piezography creates a new set of job skills that will set Kutztown University students apart from other recent graduates in their field.




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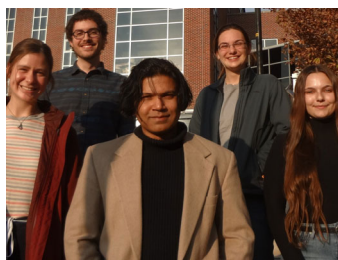
## Frances Cortez Funk

Division of Enrollment Management & Student Affairs |  
Health & Wellness Services

### State System Alcohol and Other Drugs Coalition

**Funding Source:** Pennsylvania State System of Higher Education  
Foundation Inc. / Pennsylvania Commission on Crime and Delinquency  
**Amount Awarded:** \$2,407

**Overview:** The PASSHE Inc. received funding from the Pennsylvania Commission on Crime and Delinquency to provide tools available for students to use in reducing risky choices and behaviors in substance use. The *ScreenU* program tool is designed to affect behavior by screening, giving feedback about personal scores on the screening, providing an electronic form of a brief intervention which consists of open-ended questions about the desire and readiness to change, and lastly providing helpful resources in the event that a participant would like more support or information related to alcohol and other drugs.




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## Kunal Das

College of Liberal Arts & Sciences | Physical Sciences

### Quantum Technologies with Ultracold atoms in Ring Lattices

**Funding Source:** Pennsylvania State System of Higher Education  
**Amount Awarded:** \$10,000

**Overview:** Development of quantum technologies has become a high priority research arena, with intensifying competition among the leading nations of the world. As with any cutting-edge research with multiple pathways and demanding substantial investment of time and resources, an unintended but significant feature of this quantum race is that certain favored systems and approaches have become entrenched in the field and the bulk of the research continues to be focused on those. Yet, time and again, history has shown that longer term success and leadership demands comprehensive exploration of alternate approaches and designs that may have been overlooked in the primary thrusts. That perspective defines the motivation for the proposed research which is to investigate and develop a promising alternate quantum system - ultracold atoms trapped in ring-shaped lattices for utility in precision sensing, simulations and information processing - arenas where quantum mechanics enables significant improvements.




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## Patricia Norred Derr

College of Liberal Arts & Sciences | History

### ACT 101

**Funding Source:** Pennsylvania Higher Education Assistance Agency  
**Amount:** \$30,700

**Overview:** The purpose of Act 101 funding is to support Pennsylvania students

*continued*

*(Patricia Norred Derr continued)*

who have an academic and financial need. In 2018-2019, Kutztown University's Act 101 program served forty-eight full-time students. The program collaborates with campus offices to create a student success culture that assists in their completion of a college degree. The services provided include: personalized academic support; academic advising/coaching counseling; tutoring; workshops on a variety of subjects such as time-management, note taking, test taking, and study skills; leadership experience; and assistance with financial aid. The program assists students in their transition to the demands of college life and provides the extra support necessary for their academic success at Kutztown University. In Fall 2018, Dr. Carolina Moctezuma taught a First Year Seminar to all the freshmen in the program. In Spring 2019, Dr. Patricia Derr taught a special section of the American history survey course for Act 101 students.

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## Alexander Hernandez

College of Liberal Arts & Sciences | Biological Sciences



## Manure and Pasture Management to Reduce Swine Parasites in Organic Pastured Pork

**Funding Source:** U.S. Department of Agriculture, National Institute of Food and Agriculture

**Amount:** \$118,075

**Overview:** Managing pig intestinal parasites continues to be an obstacle for organic farmers because there is a lack of organically-approved options for controlling parasites. This project explores manure and pasture management strategies to control pig parasites by reducing parasite contamination and transmission in organic pig production. Specific objectives are to: 1) evaluate parasite incidence on organic pig farms, 2) determine effectiveness of manure composting on eliminating pig parasites, 3) assess bio-fumigation as a novel approach to pig parasite control in pastures, and 4) determine effects of grazing rapeseed by organic pigs on reducing parasite contamination in pastures. Field and animal trials are being conducted at the Rodale Institute research farm in a bedded, centralized housing facility with pigs fed organic feed and provided with full-time access to pasture. This project will document the effect of composting pig manure to reduce or eliminate parasites and develop an integrated crop-livestock pasture management strategy to mitigate pig parasites in the field. By developing new measures to control pig parasites, this project aims to support transitioning and organic pig farmers as well as increase the number of pigs raised organically.

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## Dolores Hess

Division of Enrollment Management & Student Affairs |  
Health & Wellness Services



## KU Reproductive Health Services

**Funding Source:** Maternal Family & Health Services, Inc. (MFHS)

**Amount:** \$79,248

**Overview:** Reproductive health services at Kutztown University Clinical Services is offered free of charge due to a grant from MFHS. This service helps students to

*continued*



*(Dolores Hess continued)*

take charge of their own sexual and reproductive health. It is available to all male and female students of the university. Some of the resources available to students include: STD screening and treatment, gynecological and pelvic exams, contraceptive methods and counseling, pregnancy tests, breast and cervical screenings, and counseling and referrals as indicated. Last academic year, we were able to assist over 800 “unique” students in offering visits for reproductive health and family planning.

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## **Loriann Irving**

Division of Academic Affairs | Academic Enrichment

### **Student Support Services Program (SSSP)**

**Funding Source:** U.S. Department of Education

**Amount:** \$321,760

**Overview:** Students with motivation and the potential to succeed in college are given support to help realize their academic, personal, and career goals. Eligible students must be first-generation or learning disabled and meet certain academic and economic criteria. SSSP provides students with opportunities for academic development, assists them with college requirements, and motivates them toward the successful completion of their post-secondary education. The program provides academic tutoring, advice and assistance in postsecondary course selection, and assistance with information on obtaining financial aid, education to improve financial and economic literacy, and assistance in applying for admission to graduate and professional programs.

As a comprehensive academic support program, SSSP is dedicated to excellence and to the success of its diverse community of students. Through intrusive advisement, counseling, tutoring, learning, communities, mentoring, support groups, and cultural activities, the program helps prepare its students “to meet lifelong intellectual, ethical, and career challenges.”

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## **Jeremy Justeson**

College of Visual & Performing Arts | Music

### **2018-2019 Presser Undergraduate Scholar Award: Suzanne Francis - Recipient**

**Funding Source:** The Presser Foundation

**Amount Awarded:** \$4,000

**Overview:** Undergraduate schools of music at accredited colleges, universities and independent institutions of higher education are invited to apply for the opportunity to present the Presser Undergraduate Scholar Award to an outstanding music major whom they select. The Award is \$4,000 payable at the end of a student’s junior year. The student is to be selected by the music faculty guided solely by consideration of excellence and merit. This award is an honor award and the student, in his/her senior year, is to be known as a Presser Scholar. Schools of Music selected for participation in the Undergraduate Scholar Award Program must maintain a minimum enrollment of 60 undergraduate music majors, offer a curriculum of study that includes at least one-third non-music academic subjects, and show evidence of meeting high professional standards for faculty, curriculum and facilities.





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## **Eric Landquist**

College of Liberal Arts & Sciences | Mathematics

### **Open Educational Resource Development for Applied Calculus Courses**

**Funding Source:** Pennsylvania State System of Higher Education

**Amount Awarded:** \$10,000

**Overview:** Textbook prices have increased more than four times the rate of inflation since 2006. Consequently, about two-thirds of students report not purchasing at least one required textbook at some point in their college career. Most of those students understand that doing so will negatively impact their performance in the course. Therefore, it is proposed to develop an open textbook and associated open educational resources (OERs) for Applied Calculus, which is a large-enrollment, lower division mathematics course. Open educational resources are licensed to allow anyone to use, modify, and redistribute the resource for free. In fact, the proposed textbook for Applied Calculus will be an extensive revision of existing materials. A recent study has shown that OERs have been linked to increased student success, and expect the same to hold for Applied Calculus.

### **Preparation for Industrial Careers in the Mathematical Sciences**

**Funding Source:** Mathematical Association of America

**Amount Awarded:** \$1,000

**Overview:** The Preparation for Industrial Careers in the Mathematical Sciences (PIC Math) program is an NSF-funded program run by the Mathematical Association of America (MAA) and the Society of Industrial and Applied Mathematics (SIAM). The PIC Math program gives faculty resources to help them design a mathematical modeling course in which groups of students work on industrial mathematics research problems taken directly from industry. The research problems are posed by a liaison outside of academia and are to require mathematical techniques to solve, be reasonably solved during a semester, not be mission-critical, and give students a taste of mathematics in industry. In past years, students have solved problems from Terraform Engineering, Concert Wealth Management, the Borough of Kutztown Wastewater Treatment Plant, and the Kutztown University Office of Institutional Research. In the Spring 2020 semester, students will have a problem from Lutron on the optimal scheduling of service technicians. The PIC Math grant funds students to present at MathFest, MAA's annual summer conference. In August 2020, at least one student will present at MathFest in Philadelphia. Past PIC Math students have presented at MathFest Chicago and MathFest Cincinnati. Other students have presented nationally at MOP-TA at Lehigh University and the North East Association for Institutional Research Conference in Newport, RI.



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## **Linda Lantaff**

Office of Social Equity | Disability Services

### **My Place: Enhanced Services for Students with Autism Spectrum Disorder**

**Funding Source:** Pennsylvania State System of Higher Education  
**Amount Awarded:** \$5,000

**Overview:** The KU Disability Services Office along with three sister universities including West Chester, Indiana, and Edinboro implemented support programs and resources to increase the degree completion rate for college students with autism spectrum disorder. This year marks the third year of the autism program and serves 16 KU students. Participating students received weekly support through one-on-one coaching/mentoring sessions, structured study sessions, and enjoyed group activities and recreation. This year the program added an employer site visit to PPL to its career development activities. The program also had two graduates, both of whom were employed full-time upon graduation.

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## **Yun Lu**

College of Liberal Arts & Sciences | Mathematics

### **PASSHE STEM Student Research Conference**

**Funding Source:** Kutztown University Foundation  
**Amount Awarded:** \$1,436

**Overview:** Kutztown University hosted the 6<sup>th</sup> Annual PASSHE Student Research Conference in Science, Technology, Engineering, and Mathematics. This year's conference showcased the work of participants from 10 PASSHE universities. Over 140 people attended to observe and learn from more than 70 student presentations and one keynote speech. Four awards were presented to the best presentations in four categories.



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## **Khori Newlander**

College of Liberal Arts & Sciences | Anthropology & Sociology

### **Documenting Work and Life at a 19<sup>th</sup>-Century Milling Village in Northeast Pennsylvania**

**Funding Source:** Pennsylvania State System of Higher Education  
**Amount Awarded:** \$8,100

**Overview:** The rise of American industry during the late-18<sup>th</sup> and early-19<sup>th</sup> centuries dramatically transformed the United States. Historical accounts of this period of dramatic socioeconomic transformation commonly focus on the triumphs of famous people and the introduction of innovative technologies, leaving untold the stories of the ordinary men and women on whose backs these triumphs and innovations were achieved. This project seeks to tell the stories of the “invisible” men



*continued*

*(Khorl Newlander continued)*

and women who lived and worked at Stoddartsville, a 19<sup>th</sup>-century milling village built near the headwaters of the Lehigh River in northeast Pennsylvania. Previous archaeological research has established the links developed between Stoddartsville and the surrounding area as the town grew into a short-lived center of trade and industry in the region. Research conducted during the summer of 2019 focused on the recovery and analysis of artifacts reflective of those who worked at Stoddartsville in order to document how transformations in the American industrial landscape affected the lives of the countless men and women who were the real engines of industrialization.

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## **Dale Parson**

College of Liberal Arts & Sciences | Computer Science and Information Technology



## **Remote-Controlled, Creative Graphical Simulations for Planetariums & High-Resolution Display**

**Funding Source:** Pennsylvania State System of Higher Education  
**Amount Awarded:** \$8,300

**Overview:** The project director and three students - one from Computer Science (CSC), one from Kutztown's Applied Digital Arts program (APO), and one from our Astronomy program (AST) - will collaborate to design and build a set of high resolution, animated graphical software simulations for deployment in the University's planetarium and other high-resolution displays. Distinct simulations to be created include gravitational interactions among multiple astronomical bodies, weather dynamics driven by meteorological conditions, and generative digital paintbrushes for interactive composition. The CSC student will share responsibility for software design and programming with the project director. The APO student will design visual assets (building blocks) and manage composition. The AST student will manage physical modeling and mathematics code. All will contribute to creative coding and deployment to the planetarium and other public venues. Simulations will include remote control via Android tablets for use by attendees from the public as requested by the planetarium director.

*“An investment in knowledge pays the best dividends.”*

**-Benjamin Franklin**





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## Ernie Post

College of Business | Small Business Development Center

### PA SBDC Lead Center

**Funding Source:** U.S. Small Business Administration

**Amount Awarded:** \$5,287,312

**Overview:** Kutztown University is the Lead Office for the PA SBDC. The KU SBDC provides consulting, educational and informational services to entrepreneurs and small businesses in Berks, Chester, Dauphin, Lancaster and Lebanon Counties, but also serves as the Lead Office for the other 16 Centers across Pennsylvania as the Administrative Office and Fiscal Agent for the PA SBDC.

Areas of assistance include: 1) assistance in international business, including referrals to other SBDCs, and federal, state and local agencies; 2) activities to emphasize minority and women enterprise development; and 3) maintain working relationships with the local business and financial community, as well as economic development organizations, technical assistance providers and government agencies.

### Procurement Technical Assistance Center

**Funding Source:** U.S. Department of Defense through SEDA Council of Government

**Amount Awarded:** \$225,000

**Overview:** Federal, state, and local governments purchase billions of dollars of goods and services every year. Federal purchasing offices are often required to set aside contracts or portions of contracts for exclusive bidding by small and/or minority-owned businesses. In addition, major prime contractors are required to subcontract part of their work out to small firms. The Procurement Technical Assistance Center (PTAC) helps businesses of all sizes market to the government – federal, state and local. Businesses interested in government contracting and needing assistance can talk to a PTAC counselor to learn how to explore the government arena for possible market opportunities. This award is shared by Kutztown University, Lehigh University, and Widener University to serve the Southeast PTAC Region.

### State SBDC Core Funding

**Funding Source:** Pennsylvania Department of Community & Economic Development

**Amount Awarded:** \$3,257,594

**Overview:** As the Lead Office for the PA SBDC, the Kutztown University Small Business Development Center provides services to small businesses in Berks, Chester, Dauphin, Lancaster and Lebanon counties and also serves as the Fiscal Agent for the 16 SBDC Centers across PA. This program focuses on activities to strengthen the small business community by providing consulting, educational and informational services to entrepreneurs and small business owners through all phases of business development. The regional goals for this program are handled through the 10 PREP regions within the Commonwealth.

(Ernie Post continued)

## **Neighborhood Assistance Program – Special Program Priorities (NAP-SPP)**

**Funding Source:** Pennsylvania Department of Community & Economic Development

**Amount Awarded:** \$82,380

**Overview:** Kutztown University SBDC (KU SBDC) will build upon the past few years of success with the Jump Start Diversity program by continuing to grow the 8-week bilingual business skills for success program. This series markets an English and Spanish version to the City of Reading nascent and early stage entrepreneurs as well as other underserved low to moderate income residents and those who are working in various life transition programs to assimilate back into the community.

## **Community Development Block Grant**

**Funding Source:** City of Reading

**Amount Awarded:** \$18,000

**Overview:** This program targets both established entrepreneurs within the Downtown Improvement District (DID) and nascent entrepreneurs residing within the city who are identified as having a high potential of being successful entrepreneurs and who meet the HUD low-to-moderate household income guidelines. Goals include: 1) Increase the capacity of existing entrepreneurs to expand in the downtown corridor; 2) Increase the number of eligible clients to start new businesses; 3) Increase the level of customer service and customer experiences; 4) Create a digital presence to attract customers; and 5) Increase awareness and participation in government contract opportunities.

## **Engage!**

**Funding Source:** Pennsylvania Department of Community & Economic Development

**Amount Awarded:** \$18,750

**Overview:** *Engage!* is a PA statewide business and retention program with an overall goal to retain existing businesses in a community and to help them grow and expand by building solid relationships with business owners or key decision makers and economic development partners and their representatives. *Engage!* is intended to regularly interact with companies for purposes of: 1) Identifying needs and matching resources to help existing businesses and industries address their challenges to become more competitive and successful; 2) Demonstrating to local businesses and industries that the community recognizes and depends on their contributions to the local/state economy; 3) Building community capacity to sustain growth and development; 4) Understanding and addressing the common themes articulated by PA businesses in order to drive policy and the menu of the Department of Community and Economic Development and partner services for long range business retention and expansion efforts.

*continued*

*(Ernie Post continued)*

## WedNet Pennsylvania

**Funding Source:** Pennsylvania Department of Community & Economic Development

**Amount Awarded:** \$353,100

**Overview:** WEDnetPA brings training funds to qualified companies across the Commonwealth through a network of community colleges, state system universities, and other educational institutions. The keystone of the program is its ability to be responsive to the needs of Pennsylvania's business community through a flexible and easy-to-use system. An important element of this system is that businesses determine their own training needs and can select among a wide range of training providers (the WEDnetPA partners, third-party providers or in-house staff) as well as how and where the businesses will receive the training (onsite, offsite or online).



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## Christine Price

Division of Enrollment Management & Student Affairs | Women's Center & GLBTQ Resource Center



### 2018 - 2019 PA Governor's It's On US Grant

**Funding Source:** Pennsylvania Department of Education

**Amount Awarded:** \$16,420

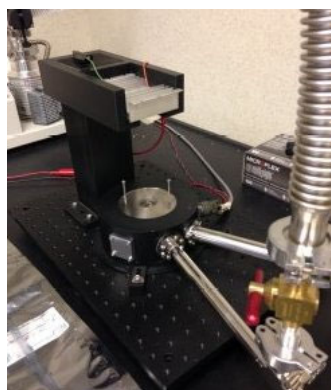
**Overview:** The PA Governor's It's On Us Grant provides the opportunity to improve sexual assault awareness, prevention, reporting, and response systems in colleges and universities to better serve all students. With this new grant funding, we were able to partner with the New Student Orientation program as well as Residence Life at KU. We coordinated a training with national experts from *Collegiate Empowerment* during orientation weekend to empower first year students to cultivate healthy relationships, change the way they think about consent and ultimately, change the culture on campus. We were also able to bring in an expert speaker from *lin6*, for a training on supporting male survivors of childhood sexual abuse and sexual assault. The mission of *lin6* is to help men live happier, healthier lives after experiencing this type of trauma.

Student Government, Residence Life, Athletics, the GLBTQ Resource Center, and various student organizations, partnered to recruit campus leaders to be photographed for the It's On Us poster campaign. Through creative and proactive marketing strategies, we increased awareness on the issue of sexual assault on campus and promoted active bystander behavior. In cooperation with Reading Metro Taxi, we made ride vouchers available for students who needed to travel to the Reading or St. Joseph's Hospitals for examinations post trauma.

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## Paul Quinn

College of Liberal Arts & Sciences | Physical Sciences



### Temperature Depend Characterization of Silicon Photo-Voltaic Cells under Steady State Simulated Solar Illumination

**Funding Source:** Kutztown University Foundation

**Amount Awarded:** \$10,822

**Overview:** The use of solar cells has continued to increase at a nearly exponential rate since their early incorporation in the space program. The overall worldwide capacity of photo-voltaic systems reached 303 gigawatts in 2016 (up 75 gigawatts from the previous year). While a promising green technology on earth to help reduce the consumption of fossil fuels, the extraction of solar energy from photo-voltaic cells in space-based applications is a near necessity. Both terrestrial and space-based applications subject solar cells to large temperature variations. On earth, only a small portion of the electromagnetic energy from the sun, mostly in the visible spectrum, is used in the generation of electricity while the remainder is absorbed only as heat. In space-based applications the lack of atmosphere subjects the solar cells to extreme thermal variations on a regular basis.

*continued*



*(Paul Quinn continued)*

In the Solar Research Lab at Kutztown University we have been investigating the performance characteristics of silicon photo-voltaic cells subjected to high and low temperature thermal exposure as compared to baseline measurements of the unaltered cells. To date, results from the research conducted point towards alteration of the photo-voltaic structure at both temperature extremes. However, these variations appear to be driven by different mechanisms. To understand these results fully, a more in-depth investigation must be undertaken at both temperature regimes. The proposed project will utilize a bifurcated approach to study the same photo-voltaic performance metrics at both temperature regimes.

The results to date show evidence of a permanent alteration to the solid-state structure of the cell and to its electrical properties. The focus of the research moving forward will be to expand and analyze these results, in both temperature regimes, in order to elicit an explanation of the mechanism driving the observable changes. An in-depth understanding of these mechanisms would provide potential to optimize the structural changes for maximum photo-voltaic performance and the potential to realize the increased performance across a larger temperature range.

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## **Phillip Reed**

College of Liberal Arts & Sciences | Physical Sciences

### **Discovery of Exoplanets, in collaboration with NASA's TESS Mission**

**Funding Source:** Pennsylvania State System of Higher Education  
**Amount Awarded:** \$9,000

**Overview:** Since 2013, the C. R. Chambliss Astronomical Observatory (CRCAO) has been employed as a follow-up observatory for exoplanet discovery. As a member of the Kilodegree Extremely Little Telescope (KELT) project, CRCAO co-discovered more than 10 new Jupiter-sized exoplanets in the galaxy. That project began with a research grant from the Pennsylvania State System of Higher Education's Faculty Professional Development Council (FPDC) and has since produced six KU students as co-authors on peer reviewed publications and a successful 3-year grant from the National Science Foundation (NSF). The current FPDC-funded project is the start of a new exoplanet discovery collaboration with NASA's Transiting Exoplanet Survey Satellite (TESS). CRCAO has been accepted as a follow-up observatory for TESS and began observations in Summer 2019. KU faculty and students perform observations and analyses in collaboration with the TESS Follow-up Observing Program Working Group to assist in the discovery of Earth-sized planets orbiting nearby stars. This exciting and important work has engaged undergraduate students as research partners, involved Kutztown University in high-profile international collaborations, and could potentially lead to continued support from NSF.





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## Jose Rosado

Division of Academic Affairs | Academic Enrichment

### TRIO / UPWARD BOUND

**Funding Source:** U.S. Department of Education

**Amount Awarded:** \$275,155

**Overview:** The Kutztown University Upward Bound Program is a federally funded college preparatory program serving 60 eligible students attending William Allen High School (Allentown School District). The program provides academic support services for income-eligible students as well as first-generation college students. The program is designed to provide students with the motivation and skills needed to successfully transition from high school to college and to go on to complete their college education. All Upward Bound Program activities and services are free to students enrolled in the program.

Upward Bound services include:

- Academic and career advising
- After-school tutoring
- College prep workshops
- Financial aid workshops and scholarship research assistance
- College tours
- Service learning opportunities
- 6-week summer program, including an on-campus college residential experience
- Opportunity to earn free college credits while still in high school
- Cultural enrichment activities and field trips

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## Maria Sanelli

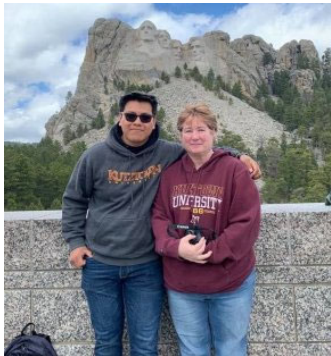
College of Liberal Arts & Sciences | History

### Arc to Equality

**Funding Source:** U.S. Department of the Interior, National Park Service

**Amount Awarded:** \$75,000

**Overview:** The 2018-2019 National Park Service Grant implemented the KU Frederick Douglass Institute's social justice teach-in model at five park sites and included four universities and seven JROTC programs. Ali Britt, Genaro Robles and Laura Gale, KU upper classmen, assisted Dr. Maria Sanelli, KU FDI Director and History Professor, in collecting data on the program's success and capturing the events through photographs. Fifteen teacher education and history students from University of Texas Arlington, University of Wisconsin Lacrosse, Dine College and California Poly Pomona participated by teaching lessons for the JROTC cadets. Seventy-two high school cadets presented content related to the park history for the group. The final report reflected many positive outcomes and resulted in the acquisition of a 2019-2020 follow-up grant intended to create an ongoing NPS and JROTC relationship using the KU model.





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## Stephen Stoeffler

College of Liberal Arts & Sciences | Social Work

### Clinical Updates Colloquium

**Funding Source:** Pennsylvania Higher Education Suicide Coalition

**Amount Awarded:** \$750

**Overview:** Grant funds were utilized to underwrite costs for the Kutztown University Department of Social Work's 3<sup>rd</sup> Annual Clinical Updates Colloquium. This day-long event served the purpose of providing continuing education on suicide prevention. Each year presenters focus on a different aspect of suicide prevention techniques or strategies. This year the topics were Attachment-Based Family Therapy and Dialectical Behavior Therapy and their utility for suicide prevention. The audience of over 350 attendees consisted of university students, professional social workers from the community (many of which supervise BSW and MSW students' internship experiences), faculty, staff, and community members. This was a much larger crowd than was anticipated. Originally the plan was to have 200 registrants.



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## Cynthia Stunkard

College of Education | Special Education

### Collaborative Research: Watershed Advocacy Using Technology and Environmental Research for Sustainability

**Funding Source:** National Science Foundation

**Amount Awarded:** \$46,192

**Overview:** The National Science Foundation awarded a 3-year grant called Watershed Awareness using Technology and Environmental Research for Sustainability (WATERS) project. Students across the United States are all affected by and dependent on water quality issues, from experiencing severe droughts to awareness of floods and drinking water issues. The WATERS curriculum incorporates hands-on local data and geospatial analysis to explore geographic, social, political, and environmental concepts and problems related to students' watersheds using inclusive learning strategies and UDL technologies. The goal is to increase student interest in STEM careers by broadening the population of students who believe they have the ability and skills to pursue STEM careers. Throughout the project, staff members from the Concord Consortium, Millersville University, Kutztown University, and STROUD Center will be observing student learning and understanding through classroom visits and interactive assessments.




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## Juliana Svistova

College of Liberal Arts & Sciences | Social Work

### Studying the Impacts of Mutual Solidarity (MUSO) Microfinance Groups on Community Wellbeing in Rural Haiti

**Funding Source:** Pennsylvania State System of Higher Education  
**Amount Awarded:** \$9,890

**Overview:** This mixed methods research project investigates the social impact of solidarity-based microfinance organizations in rural communities in Petit Goave, Haiti. Proposed outcomes of the project include evaluating the processes utilized by seven mutual solidarity groups in order to improve their programmatic effectiveness and identifying evidence-based best-practices in poverty alleviation efforts in the Haitian context. To date, 287 surveys and 7 focus groups were conducted in Haiti in August, 2019. This research will contribute to the knowledge base on social impacts of microfinance organizations on the well-being of participants and their communities. Social work students involved in the project are expected to strengthen research capacities, cultural competence, and knowledge of grassroots innovations in poverty alleviation. The funding supported the training of Kutztown University's social work student-researchers in data collection, analysis and dissemination of findings while studying an innovative, community-based solution to poverty alleviation.




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## Sarah Tindall

College of Liberal Arts & Sciences | Physical Sciences

### RiGs-Road Maps into the Geosciences

**Funding Source:** National Science Foundation  
**Amount Awarded:** \$20,945

**Overview:** Many undergraduate geoscience majors are unaware of the broad range of graduate school opportunities and careers available in the geosciences. The RiGs project forms an alliance among Missouri University of Science and Technology (S&T), Kutztown University, Southern Utah University, and several government / industry geoscience employers to establish a summer program that exposes students from diverse backgrounds to a wide array of geoscience career paths. The summer program, held at S&T, includes immersion in a PhD-granting department, coursework led by graduate faculty, research mentoring by faculty and graduate students, and networking with geoscience employers, highlighting the educational tracks and skills necessary to pursue various career paths. In Year 1 of the project, three KU students participated in the program at S&T, earned course credit, completed original research projects, and presented research results at a national Geological Society of America meeting in Phoenix, AZ.





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## Scott Tracy

College of Education | Counselor Education & Student Affairs

### Healthy Lifestyle Initiative

**Funding Source:** Pennsylvania Faculty Health and Welfare Fund

**Amount Awarded:** \$1,000

**Overview:** The KU Wellness committee received a grant to provide free chair massages and muscle tension analysis for faculty. The goal of the grant was to help faculty members identify where stress and tension was physically stored in their body. Lauren White, a certified massage therapist provided chair massages and tension analysis over a two-day period on Wednesday, April 24<sup>th</sup> and Thursday, April 25<sup>th</sup>. Lauren White, a Pennsylvania certified massage therapist with additional certifications in holistic treatments, conducted stress reducing interventions on 48 faculty members. Participants provided positive feedback and requested similar wellness programs in the future.

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## John Vafeas

College of Liberal Arts & Sciences | Social Work

### Kutztown University BSW at RACC and SAM Spanish Speaking Interns to Employees

**Funding Source:** Service Access & Management, Inc. (SAM)

**Amount Awarded:** \$29,400

**Overview:** This project fits into the overall strategic initiative of the Department of Social Work to promote innovations and partnerships between university and community agencies. Accordingly, this grant is funded by Service Access & Management, Inc. (SAM) to Kutztown University's Social Work Department to support and encourage the BSW completion program at Reading Area Community College (RACC) and strengthen our partnership with this major state-wide provider of services to people with mental health and developmental disabilities. For the two-year duration of the grant up to 12 Spanish speaking (bilingual) senior students will be accepted. Students who participate in the KU BSW completion program on the RACC campus and are fluent in Spanish, are approved to take and successfully complete a one-year internship within the SAM, Inc. organization, and take a case management course. In return, the students will receive a stipend of \$2,500 each and an employment offer from SAM.



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**FangHsun Wei**

College of Liberal Arts & Sciences | Social Work

**Council on Chemical Abuse Needs Assessment**

**Funding Source:** Council on Chemical Abuse

**Amount Awarded:** \$9,996

**Overview:** This funding was used to conduct a Berks County substance prevention needs assessment. The Council on Chemical Abuse formed a Community Conversation Team to assist with identifying community substance use problems, collect community members' thoughts on substance use issues, analyze survey and focus group data, and review results. The ultimate goal of this needs assessment was to identify the community resources and provide the potential prevention methods to reduce substance use among youth in Berks County.

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**Michele White**

College of Education | Elementary Education

**Jennefer Gehringer**

College of Education | Elementary Education

**Wendy Rogers**

College of Education | Special Education

**Youth Mental Health First Aid**

**Funding Source:** Substance Abuse and Mental Health Services through Bloomsburg University

**Amount Awarded:** \$4,000

**Overview:** Youth Mental Health First Aid (YMHFA) is a national, evidenced-based program with goals of increasing mental health literacy and building skills to provide help and care for people experiencing mental health and addiction challenges. It involves an 8-hour training course that when successfully completed will include a certificate. This training is being offered to all teacher candidates entering their clinical experience by our certified instructors, Dr. Jennefer Gehringer, Department of Elementary Education, and Dr. Wendy Rogers, Department of Special Education. Mental health awareness is critical in today's schools and communities. Participants being trained in YMHFA learn risk factors, warning signs, and strategies through a 5-step process for assisting someone in a mental health crisis and non-crisis situations. The training teaches how to recognize the symptoms of mental health problems, how to offer and provide initial help, and how to guide the individual to professional help, if appropriate. This training is an important opportunity for professional preparation in becoming an effective and influential educator.

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## Amy Pfeiler-Wunder

College of Visual & Performing Arts | Art Education



### **Socially Engaged Pedagogy: The Impact of Teacher Identity on Views of the Learner and Curriculum Development**

**Funding Source:** National Art Education Foundation

**Amount Awarded:** \$10,500

**Overview:** This 2-year research project will support art educators understanding the impact of personal and professional identities on views of the learners and curriculum development in art educational settings. Examining identity includes unpacking privilege and power, with specific regard to intersections of class, race, and gender coupled with sexual identity, among ageism, personal history and other aspects of identity-both visible and invisible. This aligns with the National Art Education Association (NAEA) Research Agenda to provide equitable access in the visual arts for learners with “regard to, sexual orientation, cultural identity, religious beliefs, and other areas where prejudice and marginalization may exist.” Using narrative case studies in partnership with survey data, the research projects seeks to identify patterns, challenges, and absences in educators’ understanding of how one’s identity impacts views of the learners and choices in curriculum design.

This project also addresses the NAEA Research Commissions Research Agenda to study *Student/Learning* with a focus on one’s cultural contexts and social justice. This research explicitly addresses the NAEA Research Agenda call for research on the following questions: How does the field prepare educators to apply inclusivity in their teaching practice? How do pre-service programs prepare art educators to respect and teach content based on social justice?

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## Gwendolyn Yoppolo

College of Visual & Performing Arts | Art Education



### **The Poetics of Color Development in Ceramic Raw Materials**

**Funding Source:** Pennsylvania State System of Higher Education

**Amount Awarded:** \$10,000

**Overview:** Incorporated into ceramic glazes, slips, and clay bodies, the Lanthanide family of elements produces intriguing color shifting and fluorescent effects, depending on the light source illuminating them. This research will explore and document these effects in a series of tests that explore colorant combinations, various base recipes with different surface qualities, variables related to the firing conditions of the pieces, and the effects of different forms of lighting on fired samples. Work will focus on developing innovative testing procedures that are at once grounded in scientific reasoning while also being guided by aesthetic concerns and an intuitive approach. Cohesive palettes of colors that shift in response to different lighting sources will be developed for use in artistic production. Ceramic art produced using these colorants can stretch the boundaries of human perception, opening our minds to our limitations and questioning our usual mode of understanding our world.



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## Ju Zhou

College of Liberal Arts & Sciences | Mathematics

### Field Trip to MoMath Museum in New York

**Funding Source:** Kutztown University Foundation

**Amount Awarded:** \$560

**Overview:** On Saturday, September 28, 2019, Dr. Zhou took a group of Kutztown University students and faculty to MoMath, the National Museum of Mathematics. The museum highlights the role of mathematics. Its exhibits, galleries and programs are designed to stimulate inquiry, spark curiosity and reveal the wonder of mathematics. This was a great opportunity for students and faculty to explore math projects outside of classroom.

### Investigation of Perfect Matching Transitivity of Several Families of Graphs

**Funding Source:** Pennsylvania State System of Higher Education

**Amount Awarded:** \$10,000

**Overview:** A graph  $G$  is perfect matching transitive, shortly PM-transitive, if for any two perfect matching  $M$  and  $N$  of  $G$ , there is an automorphism  $f: V(G) \mapsto V(G)$  such that  $f_e(M) = N$ , where  $f_e(uv) = f(u)f(v)$ . Dr. Zhou and her student worker are working on charactering the PM-transitivity of several family of graphs such as circulant graphs, Cayley graphs and symmetric graphs. They have fully characterized the PM-transitivity of circulant graphs of order 6 and 8, partially characterized the PM-transitivity of circulant graphs of order 10.

*“Research is formalized curiosity. It is poking and prying with a purpose”*

-Zora Neale Hurston



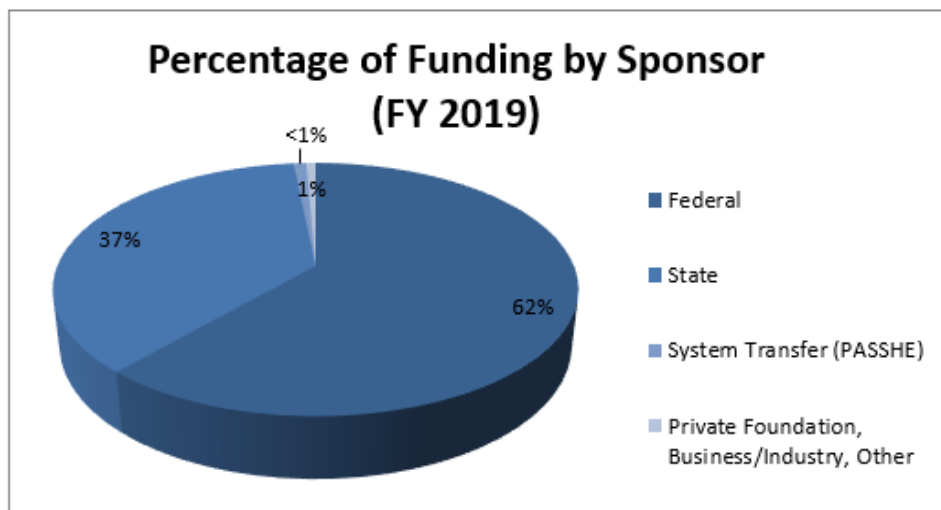
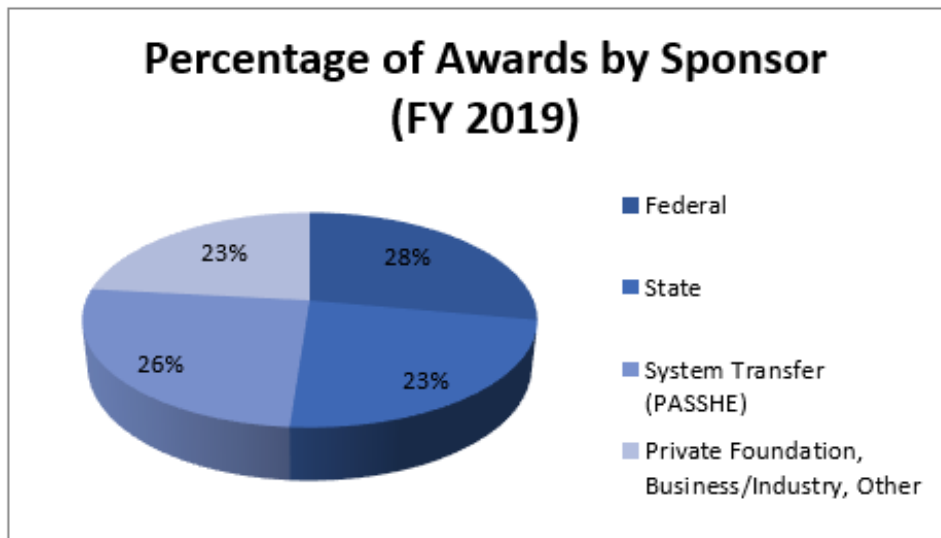
## External Funding Facts and Figures

During Fiscal Year 2019, faculty and staff submitted 57 proposals to external sponsors requesting \$11,475,881 (90% increase) and received 42 awards totaling \$10,403,323, (108% increase). Twelve proposals were pending at the end of the fiscal year.

The largest number of awards came from the Federal category (28%). Awards in other categories included State, System Transfer and Private Foundation. The largest amount of funding came from Federal sponsors (62%), approximately \$6,423,534.

	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019 <sup>1</sup>
<b>Submissions</b>	65	51	72	55	57
<b>Awards</b>	42	40	44	37	42
<b>Total Requests</b>	\$4,783,487	\$2,391,873	\$3,866,534	\$6,052,265	\$11,475,881
<b>Total Awards</b>	\$2,533,805	\$2,078,547	\$2,639,870	\$4,990,785	\$10,403,323

1. 12 proposals were pending at the end of fiscal year 2019.



## Kutztown University Professional Development Committee Funding

The Professional Development Committee provides funding to promote scholarship. Funding is available for 1) travel assistance for professional and scholarly activities, 2) projects that enhance instruction, and 3) the purchase of items necessary to develop a novel approach and/or new direction for a course.

### Recipients of Professional Development Committee Funding

NAME	DEPARTMENT
Aimee Adams	Counseling & Psychological Services
Mohammad Adeel	Philosophy
Roman Altshuler	Philosophy
Allan Back	Philosophy
Tabetha Bernstein-Danis	Special Education
Angel Bestwick	Elementary Education
Phillip Bolger	Criminal Justice
Ryan Bowers	Counselor Education
Anne Brawand	Special Education
Mario Cardozo	Geography
John Carelli	Computer Science & Information Technology
Kurt Cavender	English
Kerri Cebula	Sport Management & Leadership Studies
Leslie Chaundy	Social Work
Angela Cirucci	Communication Studies
Colleen Clemens	English
John Conahan	Social Work
Bradley Congelio	Sport Management & Leadership Studies
Maira Conway	Geography
Helen Cooper	Art & Art History
AnnMarie Cordner	Criminal Justice
Michael Covello	Art & Art History
Muhammed Dalgin	Business Administration
Kunal Das	Physical Sciences
Michael Davis	Geography
Anne DeLong	English
Michael Downing	English
Deborah Duenyas	Counselor Education
Diana Ebersole	Communication Studies
Diane Elliot	Library & Learning Technologies
Brooks Emerick	Mathematics
Muratcan Erkul	Business Administration
Kristina Fennelly	English

Kurt Frieauf	Physical Sciences
Albert Fu	Anthropology & Sociology
Savannah Ganster	Communication Studies
Janice Gasker	Social Work
Soo Goh	Music
James Gutierrez	Music
Christopher Habeck	Biological Sciences
Helen Hamlet	Counselor Education
Edward Hanna	Social Work
Julia Hovanec	Art Education
Gregory Hanson	Modern Language Studies
Qian Hao	Business Administration
Richard Heineman	Biological Sciences
Curt Herr	English
Paula Holoviak	Political Science & Public Administration
Ko-Hsin Hsu	Criminal Justice
Tauqeer Hussain	Computer Science & Information Technology
Loriann Irving	Academic Enrichment
Peter Isaacson	Music
Joseph Jedwab	Philosophy
Mauricia John	Anthropology & Sociology
Nicole Johnson	Special Education
Deryl Johnson	Communication Studies
Michael Johnston	Cinema, Television, and Media Production
Matthew Junker	Physical Sciences
Eun Yeon Kang	Business Administration
Greg Kaufinger	Business Administration
Tracey Keyes	Elementary Education
Mahfuzul Khondaker	Criminal Justice
Robert Kilker	English
Yoon Mi Kim	Social Work
Yongjae Kim	Sport Management & Leadership Studies
Soojin Kim	Sport Management & Leadership Studies
Kevin Kjos	Music
Erin Kraal	Physical Sciences
Jonathan Kramer	Business Administration
Jonathan Kremser	Criminal Justice
Brandon Krieg	English
Brian Kronenthal	Mathematics
Rajeev Kumar	Business Administration
Lynn Kutch	Modern Language Studies
Eric Landquist	Mathematics

Mathias Le Bosse	Geography
Ahyoung Lee	Social Work
Inmi Lee	Art Education
Perry Lee	Mathematics
Steve Lem	Political Science & Public Administration
Sandra Leonard	English
John Lizza	Philosophy
Keith Logan	Criminal Justice
Yun Lu	Mathematics
Debra Lynch	Special Education
Amy Lynch-Binieck	English
Sharon Lyter	Social Work
Dannell MacIlwraith	Communication Design
Candida Madrigal	Social Work
Mostafa Maksy	Business Administration
Carol Mapes	Biological Sciences
Jermaine Martinez	Communication Studies
Keith Massie	Communication Studies
Nicole McClure	English
Catherine McGeehan	Elementary Education
Matthew McKeague	Cinema, Television & Media Production
Lyn McQuaid	Mathematics
Claire McQuerry	English
Joshua Miller	Communication Design
Andrew Miness	Secondary Education
Amanda Morris	English
Lauren Moss	Counselor Education
Scheherazada Zuniga Murphy	Modern Language Studies
Khori Newlander	Anthropology & Sociology
Carrie Nordlund	Art Education
Christine Nunez	Modern Language Studies
Melissa Nurczynski	English
Adrienne Oakley	Physical Sciences
Megan O'Byrne	Communication Studies
Amber Pabon	Secondary Education
Julie Palkendo	Physical Sciences
Sophia Jung Park	Art Education
Dale Parson	Computer Science & Information Technology
Amy Pfeiler-Wunder	Art Education
Robert Portada	Political Science & Public Administration
Patricia Pytleski	English
Yuxia Qian	Communication Studies



Paul Quinn	Physical Sciences
Christine Rhoads	Business Administration
Glenn Richardson	Political Science & Public Administration
Jessica Robinson	Communication Studies
Angelo Rodriguez	Modern Language Studies
Jesus Rodriguez	Modern Language Studies
Wendy Rogers	Special Education
Nicole Romanski	Art Education
John Ronan	English
Jose Rosado	Upward Bound
Lindsey Runell	Criminal Justice
Christopher Sacchi	Biological Sciences
Christine Saidi	History
Rachel Salerno	Modern Language Studies
Maria Sanelli	History
James Schnell	Communication Studies
Steven Schnell	Geography
Dylan Schwesinger	Computer Science & Information Technology
Gregory Setliff	Biological Sciences
Jacob Sewall	Physical Sciences
Jonathan Shaw	English
Laura Sherrod	Physical Sciences
Yong Sang Charlie Shim	Computer Science & Information Technology
Kim Shively	Anthropology & Sociology
Dawn Slack	Modern Language Studies
Justin Smoyer	Physical Sciences
Myung Song	Mathematics
Kathleen Stanfa	Special Education
John Stanley	History
Donna Steslow	Business Administration
Stephen Stoeffler	Social Work
Ronald Stoffey	Psychology
Matthew Stone	Biological Sciences
Jennifer Suwak	Cinema, Television, and Media Production
Juliana Svistova	Social Work
Teresa Sychterz	Elementary Education
Dan Talley	Art & Art History
Joo Tan	Computer Science & Information Technology
Necati Tekatli	Business Administration
Scott Tracy	Counselor Education
Valarie Trollinger	Music
Todd Underwood	Biological Sciences

John Vafeas	Social Work
Tracy Vargas	Anthropology & Sociology
Francis Vasko	Mathematics
Andrew Vogel	English
Patricia Walsh Coates	Secondary Education
Patrick Walters	English
Carol Watson	Elementary Education
Lisa Weckerle	Communication Studies
FangHsun Wei	Social Work
Mary Rita Weller	Social Work
Amanda Whispell	Biological Sciences
Todd Williams	English
Mark Wolfmeyer	Secondary Education
Wing Hong Tony Wong	Mathematics
Gwendolyn Yoppolo	Art Education
Nancy Zimmerman	Modern Language Studies

### Professional Development Committee Facts

The Professional Development Committee awarded \$162,554 in funding to 184 applicants. The majority of the funding was used to support faculty travel to present scholarly work. Other funding was used to enhance instruction and support faculty purchases of materials to develop a novel approach and/or new direction for a course.

	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
<b>Received</b>	139	163	185	183	185	184
<b>Awarded</b>	137	159	182	181	184	184
<b>Total Requested</b>	\$ 113,372	\$ 145,939	\$ 171,426	\$ 169,023	\$ 161,568	\$ 162,554
<b>Total Awarded<sup>1</sup></b>	\$ 112,372	\$ 141,401	\$ 169,084	\$ 167,223	\$ 160,968	\$ 162,022
<b>Annual Funding Available</b>	\$ 120,482	\$ 120,482	\$ 150,482	\$ 165,482	\$ 150,482	\$ 150,482

1. Total Awarded may exceed Annual Funding Available due to the carryover of funds from prior years.









# KUTZTOWN

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## U N I V E R S I T Y

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