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| a. REPORT | b. ABSTRACT | c. THIS PAGE | | | Leanne Petry |
| UU | UU | UU | UU | | 19b. TELEPHONE NUMBER 937-376-6656 |

# RPPR Final Report
as of 01-Aug-2023

Agency Code: 21XD

Proposal Number: 78074RTREP **Agreement Number: W911NF-21-1-0144**
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**Report Date:** 31-Jul-2023 Date Received: 31-Jul-2023
**Final Report** for Period Beginning 01-May-2021 and Ending 30-Apr-2023
**Title:** Integrated Instrumental System for Research and Education in Analytical Chemistry
**Begin Performance Period:** 01-May-2021 **End Performance Period:** 30-Apr-2023
**Report Term:** 0-Other

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**Distribution Statement:** 1-Approved for public release; distribution is unlimited.

**STEM Degrees:** 57 **STEM Participants:** 11

**Major Goals:** Major Goals: In the August 2022 Interim Progress Report, the Principal Investigator (PI) and Co-Principal Investigator (Co-PI) shared the objectives this funded effort met. These objectives were the ability to provide transformative learning experiences in analytical chemistry education and increase research efforts at Central State University (CSU). Also presented in the supplemental file of that report were photographs of the newly acquired and installed advanced instrumentation purchased utilizing the funds from this grant. These equipment assets enabled the CSU PI and Co-PI to provide these transformative learning experiences in the form of updated curricula, undergraduate research and summer internship opportunities to better prepare associated majors for the workforce to address a variety of STEM discipline-specific problems in a technologically-oriented world. It also assisted recent graduates from the College of Engineering, Science, Technology, and Agriculture (CESTA) to be more competitive in their graduate school applications.

As it relates to curriculum improvements, the PI and Co-PI recognize that it is common for students to struggle in upper-level STEM courses due to a lack of retention and connection of information from lower-level courses, a misperception of the role of pre-requisites, and/or a discontinuity between interrelated and interdisciplinary courses. As chemistry is an applied physical science that involves the systematic study of nonliving substances, this systematic study is dependent upon the accumulated acquisition of foundational knowledge which is integral to the application of higher-ordered thinking skills and metacognition. Realizing the importance of mapping the skills acquired in quantitative analysis which are needed for instrumental analysis, the PI and Co-PI co-taught a two-semester analytical chemistry sequence during this reporting period (Quantitative Analysis; Fall 2022 and Instrumental Analysis; Spring 2023) to connect students to their undergraduate curriculum and encourage them to persist in the major as they transition from first-year freshmen to upperclassmen. This intentional scaffolding and curricular alignment positively impacted students who demonstrated a greater propensity to develop not only laboratory and quantitative skills but also cognitive and critical thinking skills required of today's workforce. This assessment was evidenced by improved written communication and analysis of results in laboratory reports as well as improved final course grades.

Additionally, the DoD's support of this equipment initiative assisted the CSU PI and Co-PI to enhance their research acumen, external academic, industrial, and governmental collaborations, and involvement of both undergraduate

and graduate students in the research process and to secure jobs in their field upon graduation. These interactions provided students increased undergraduate as well as graduate research and summer internship opportunities, both internally and externally, to practice the skills needed to maintain their long-term competitive advantage in research as well as in pursuing advanced education at the graduate level.

This funding enabled all these educational goals to be achieved specifically by:
1. Enhancing the competency and level of preparedness of CSU students to pursue either advanced degrees or careers in analytical chemistry and materials degradation upon graduation from the chemistry program.
2. Enhancing the capacity and capability of CSU undergraduate students in achieving proficiency in research and applying the process of scientific writing based on their understanding of analytical chemistry and advanced instrumentation.
3. Providing increased developmental opportunities for faculty and students to use state-of-the-art technologies to pursue innovative research topics in analytical chemistry.
4. Helping CSU develop expertise in analytical chemistry and materials degradation of natural products and other polymeric materials, while simultaneously providing research and hands-on training opportunities for students relative to their careers.
5. Assisting with attracting new first-time freshmen and transfer students to HBCUs, in general, and specially, to CSU.
6. Supporting ongoing collaborative research with neighboring, regional and international institutions such as the University of Dayton, Bowling Green State University, St. Mary's University, the Air Force Institute of Technology and the American University.

**Accomplishments:** Accomplishments: Significant accomplishments included the purchasing and installation of the identified instrumental components as presented in the supplemental documentation provided with the August 2022 Interim Progress Report. The items purchased were as proposed: (1) a Raman spectrometer, (2) thermogravimetric analyzer, (3) differential scanning calorimeter, (4) corrosion test chamber, and (5) scanning electron microscope. These items comprised the major research/research-related education components of the integrated system required to study the products of chemical degradation.

Despite delays in receiving some capital equipment and purchased services required for equipment installation due to the Covid pandemic, all items have been received and installed with site specific training. In the case of the corrosion chamber installation, those purchased services had to be renegotiated from the original quotation resulting in a change in contracted facilities services to install the equipment and a slight increase in cost for installation. Additionally, one item received had an out of box failure and was shipped back to the manufacturer for a replacement. Initial delays in receipt of some items were due to the shortage of circuit boards which impacted timely receipt of some equipment ordered.

Academic and research projects under consideration for collaboration during the last reporting period have been implemented between the PI and Co-PI and with various external partners. The PI and Co-PI developed new laboratory experiments for the Quantitative Analysis; Fall 2022 and Instrumental Analysis; Spring 2023 courses which are part of the two-semester sequence of Analytical Chemistry. These laboratory experiments moved away from "canned" or "cookbook" laboratory procedures that relied on the "one-and-done" type of experiment and are now research-project based which is in alignment with current best practices for teaching Analytical Chemistry. Providing experiential learning opportunities for students grounded in evidence-based research principles strengthens the overall undergraduate curriculum by addressing the objectives noted which were to increase collaborations, internships/undergraduate research and training of university faculty and their students.

Specifically, this equipment impacted the PI and Co-PI positively by augmenting their research capacity to characterize chemical materials and products of degradation. Additionally, this capacity building enhanced their STEM educational programs, curricular updates and improved the overall academic, workforce and professional development of students. Lastly as HBCUs do not garner the same level of public and financial support as majority or predominately white institutions (PWIs), this equipment enabled the PI and Co-PI to be more competitive in the research process as evidenced by advancing ongoing collaborations and work product between CSU and Bowling Green State University (BGSU) and CSU with the University of Dayton (UD), for example.

Another key accomplishment is the implementation of new collaborations with international entities. This summer's research immersion for one undergraduate pre-service educator student and one K-12 in-service educator teacher was in Cairo, Egypt. This 19-day immersion is a direct result of outreach and capacity building by the PI and Co-PI to leverage resources from another currently funded grant to provide research experiences for teachers. This

particular immersion focuses on "differently-abled" individuals with the purpose to examine and develop assistive technologies to mobilize individuals and transform lives for the betterment of citizens in global societies. These interactions are cross-cultural between Cairo, Egypt and the Dayton, Ohio region and involve two institutions of higher education in the collaboration: the American University in Cairo, Egypt and Central State University.

Challenges: This support also assists the PI and Co-PI with several other institutional initiatives aimed at increasing student enrollment and retention in the College of Engineering, Science, Technology and Agriculture. The first initiative enhances an integral part of the university's mission which is expansion of certificate and degree programs. Tailor made analytical and instrumental certificate programs for graduates and other personnel in various industrial fields looking to advance their careers in rapidly advancing areas of technology desire academic offerings that are easily accessible and short in duration. Another initiative is offering an integrated science degree (IDS) that is tailored to STEM majors based on personal and regional industrial needs. The future careers of those students who enroll in the IDS degree and other STEM professionals who choose CSU for furthering their technical competency by enrollment in a certificate program will stimulate the local economy by increasing the number of qualified individuals in the region to meet the workforce needs. A third initiative is related to an institutional goal of offering advanced degree programs in CESTA. These assets will assist with defining curriculum for graduate programs grounded in analytical chemistry. Lastly and as a composite of the nation, the Army seeks to commission officers to join its ranks. In pursuit of this talent, ROTC programs aim to support the total Army by acquiring students from a variety of geographic, academic and demographic regions to develop and assemble leaders with diversity in mind. The ROTC program at CSU seeks to strengthen its fundamental requirements as a nationally viable and strategically postured unit able to meet production requirements and commission future officers that represent the population they serve.

Since the proposal was written and subsequently submitted in August of 2020, which was at the height of the Covid pandemic, CSU experienced significant personnel and leadership changes at all levels of administration including within the military science program. Changes that directly impacted the outcomes of these initiatives noted in the preceding paragraph occurred at the departmental and college level. The chair position has changed over three times, and there have been four deans. This high rate of turnover challenges the PI and Co-PI's ability to implement curriculum reform and program review as well as develop new learning opportunities for students in the form of exciting new courses and certificates on special topics. This instability impacts the PI and Co-PI's progress to actualize these program reforms within the chemistry major as well as attract perspective students.

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**Training Opportunities:** Training Opportunities: It was shared in the August 2022 Interim Progress Report that site specific training occurred on the (1) a Raman spectrometer, (2) thermogravimetric analyzer, (3) differential scanning calorimeter, (4) corrosion test chamber, and (5) scanning electron microscope; and that due to the Covid pandemic, some of the equipment/instrumentation advanced trainings for the PI and Co-PI to assist with method development were placed on hold for the protection of the health and wellness of all concerned. In April 2023, a service engineer from Thermofisher came to CSU to perform an instrument repair on the Raman spectrometer and conducted advanced training for the PI at that time.

To date, approximately $4,000 in project funding remains in the budget after purchase of the required system components and other associated encumbered/committed expenses. This remaining amount was not executed due to unresponsive requests for a no cost extension (NCE). The original request was submitted on 13 April 2023, prior to the end of the performance period, with subsequent follow up by the university (see supplemental documentation). As Central State University is a small undergraduate institution, these funds were held in reserve for the PI and Co-PI. While the remaining budget was allocated for travel of the PI and Co-PI, upon further discussion the PI and Co-PI decided the best use of these remaining funds would be to support the purchase of technology equipment in the form of portable technology devices, including computers and tablets, that the faculty could use to interface between the laboratory instrumentation and the classroom. The ability to monitor and transition data analysis remotely used in research into the classroom creates greater opportunities for students and local high school teachers involved in an existing research experiences for teachers grant and impending research experiences for undergraduates grant to benefit by becoming familiar with the technology and equipment in order to broaden participation and outreach efforts. Thus, the purchase of improved technology for classroom use will assist with this technical aspect of teaching.

Additionally, the PI and Co-PI are looking for funding to support conference attendance to strengthen their dissemination of results and facilitate networking opportunities to increase potential collaborations. These new partnerships in turn increase opportunities for CSU faculty and student research and aid in capacity building and workforce development. During this reporting period the project implementation and data analysis has been undertaken with existing collaborators from these advanced analytical components. The PI and Co-PI are in need of funds to share outcomes of their research and pedagogical efforts with the broader community, in particular regional, national and international educators as well as industrial and governmental partners. Institutionally, academic departments at CSU are provided little to no funds to support faculty technology upgrades or travel to conferences to present results from their scholarly work. Similarly, the academic departments do not provide funding to faculty to assist with the cost incurred to publish their research in peer reviewed journals. The PI and Co-PI request approval for expenditure of these remaining funds in support of their work, research and teaching efforts.

In so far as student training, through the two-semester analytical chemistry course sequence (Quantitative Analysis; Fall 2022 and Instrumental Analysis; Spring 2023) co-taught by the PI and Co-PI, they trained registered students on various instrumentation in a project-based learning environment to enhance their professional skills and develop proficiency with equipment utilization and communicating results both orally and in writing. Transference of skills occurred for senior level undergraduates who integrated learning with their capstone research projects which are conducted over two semesters in their final year as chemistry majors. Additionally, the PI and Co-PI began co-teaching physical chemistry in Spring 2023 and are working to update the curriculum and redesign the thermodynamic laboratory experiments to make use of this advanced instrumentation. This new initiative requires a lot of course preparation and collaboration to implement. Additionally, numerous signatures and paperwork had to be completed by them which included updated student learning outcomes and approved at the department, college and university senate levels to allow both the PI and Co-PI, who are both full professors in the chemistry program, to co-teach/team teach this particular physical chemistry course. Expansion of student training into the physical chemistry realm enhances student learning of applied thermodynamics.

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**Results Dissemination:** Results Dissemination: To date, scholarly work and collaborative efforts have been shared at various venues and in multiple modalities. As reported previously, the PI and Co-PI published an article in the Scientific Journal of Biology and Life Sciences in February of 2022 discussing aspects of securing funding for small undergraduate teaching institutions. It was also shared that the Co-PI presented at the HBCU Digital Literacy Summit hosted by the Air Force in June 2022. Topics discussed included ways to improve partner relationships that focus on the technological and intellectual aspects of collaborations not just the financial resources.

Currently, the PI and Co-PI are finalizing a second manuscript which is pedagogical in nature and related to the intentional alignment of Quantitative Analysis with Instrumental Analysis. Utilizing an experiential laboratory project, they connected the quantitative nature of data analysis with advanced instrumentation to strengthen the undergraduate program curriculum and enhance participating students' success. Most recently the PI presented at the 2023 ASEE International Conference and Exposition on the impact of community engaged learning projects with K-12 teachers from the first RET cohort from the previous calendar year. This calendar year's efforts will culminate with a curriculum workshop for the second RET cohort during the last two weeks of July 2023 and a research component in Fall 2023. A rewarding piece of this NSF RET funded effort for the PI and Co-PI will be actualized in the final work product of two of the K-12 educators who will integrate their recent almost three week international immersion experience in Egypt, which was coordinated by the PI and Co-PI as part of this effort and included interaction with the American University in Cairo, Egypt, into a curriculum activity with a significant intercultural awareness and service piece that they will pilot in their classroom with their students in Fall 2023. Also of significance is that the developed curriculum will emphasize their research into the United Nation's Sustainable Development Goals (SDGs) and the interconnected global aspects of the goals among countries. This grant partners faculty with local K-12 STEM and community partners in other parts of the world to allow the teachers to participate in STEM research and learn how appropriate technology is applied around the world. Moreover, the PI and Co-PI are involved with integrating these high impact practices with their international collaborators in an effort to impact education on an international and global scale.

Two other exciting research efforts are making their way into the data analysis and manuscript writing phase. The research group at Bowling Green State University began working in collaboration with the PI from Central State University as part of the NSF LEAPS Grant. As shared in the flyers presented in the supplemental document to this report, students from CSU were recruited the past two summers to conduct research at BGSU as NSF REU funded opportunities. One of the students from the summer 2022 internship continued this work at CSU in fulfillment of the two-semester undergraduate research capstone project requirement for chemistry majors. Additionally, and in exchange, two graduate students from BGSU came to CSU to work with the PI. As evidenced in the supplemental document photographs, one of the graduate students made use of the corrosion chamber to evaluate the longevity of their coating formulation system intended to protect historical markers and veteran memorials as well as protect them against graffiti. This work was funded by a National Park Service Grant. The SERDP grant funded work in partnership with the University of Dayton, Naval Research Lab, and Air Force Research Lab is finishing up its analysis efforts as well. This SERDP effort also funded student summer internships at CSU to work on research utilizing advanced instrumentation and is also aimed at assessing coating degradation.

Plans Next Period: During the next academic year 2023-2024, the PI and Co-PI plan to:

1. Redesign the physical chemistry thermodynamics laboratory via a research project that incorporates use of advanced instrumentation purchased from this grant.

2. Finalize and publish their pedagogical paper connecting two major courses (Quantitative Analysis; Fall 2022 and Instrumental Analysis; Spring 2023) in Analytical Chemistry via an experiential research project that extended over two semesters or one academic year. While this effort also required a lot of course preparation and collaboration as well numerous signatures and paperwork to allow the PI and Co-PI to co-teach/team teach both courses, the outcomes of this effort were favorable in terms of student success. The PI and Co-PI are once again co-teaching Quantitative Analysis in Fall 2023. This iteration will enable them to validate some of their findings and assessments prior to submission for publication.

3. Finalize internally and externally partnered research and publish papers on the results acquired through the utilization of this equipment in support of those collaborative research and scholarly efforts.

4. Continue to advance the international collaboration with the American University in Cairo by engaging in cooperative sample analyses using state-of-the-art instrumentation purchased through this grant. The PI and Co-

PI are looking for sponsorship in support of in-person research and curriculum abroad efforts. By going abroad, the PI and Co-PI hope to infuse their expertise in person with their international partners and become involved firsthand with their research and curriculum needs. This involvement will also draw upon the Library of Congress resources and digital collections to support efforts to improve STEM knowledge on a global scale. The Library of Congress supports a branch in Cairo, Egypt. Similar to the international efforts, the PI and Co-PI expertise will be extended nationally and in particular, regionally, to the Air Force Institute of Technology (AFIT) at Wright-Patterson Base in Fairborn, Ohio who is currently planning a site visit to CSU in Fall 2023.

5. Share PI and Co-PI expertise to assist junior faculty to expand academic programs and apply for grants successfully.

6. Continue to bridge undergraduate research with internal and external collaborators, both nationally and internationally to expand capacity building efforts. Leveraging these assets in support of new research efforts and proposals with assist the PI and Co-PI in securing additional much needed resources such as the viscometer anticipated to be delivered to CSU in August 2023. This new equipment receipt will be the direct result of a successfully awarded collaborative NSF MRI proposal to investigate temperature and tribological characteristics of chemical materials. It will also further enhance research and educational efforts aimed at updating the physical chemistry thermodynamics laboratory.

**Honors and Awards:** The Central State University PI and Co-PI both received institutional recognition at the 2022 Research and Scholarly Activities Day hosted by the University back in April of 2022. Receipt of this funding award contributed to the highest dollar amounts for competitive awards received by the PI and Co-PI (see supplemental documentation provided in August 2022 Interim Progress Report).

**Protocol Activity Status:**

**Technology Transfer:** Nothing to Report

**PARTICIPANTS:**

**Participant Type:** PD/PI
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**Person Months Worked:** 9.00 **Funding Support:**
Project Contribution:
National Academy Member: N

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Project Contribution:
National Academy Member: N

**Participant Type:** Faculty
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**Person Months Worked:** 3.00 **Funding Support:**
Project Contribution:
National Academy Member: N

**Participant Type:** Faculty
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**Person Months Worked:** 3.00 **Funding Support:**
Project Contribution:

National Academy Member: N

**Participant Type:** Research Experience for Undergraduates (REU) Participant
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Project Contribution:
National Academy Member: N

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**Participant:** Cory Sims
**Person Months Worked:** 2.00 **Funding Support:**
Project Contribution:
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Project Contribution:
National Academy Member: N

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Project Contribution:
National Academy Member: N

**Participant Type:** Undergraduate Student
**Participant:** Voni Jones
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Project Contribution:
National Academy Member: N

**Participant Type:** Undergraduate Student
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**Person Months Worked:** 5.00 **Funding Support:**
Project Contribution:
National Academy Member: N

**Participant Type:** Co PD/PI
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**Person Months Worked:** 7.00 **Funding Support:**
Project Contribution:
National Academy Member: N

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Project Contribution:
National Academy Member: N

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**Participant:** Alice Boykin
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Project Contribution:
National Academy Member: N

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**Participant:** Lavano Sands
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Project Contribution:
National Academy Member: N

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Project Contribution:
National Academy Member: N

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National Academy Member: N

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National Academy Member: N

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Project Contribution:
National Academy Member: N

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**Participant:** Christopher Morris
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Project Contribution:
National Academy Member: N

**Participant Type:** Other Professional
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Project Contribution:
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Project Contribution:
National Academy Member: N

**Participant Type:** Faculty
**Participant:** Kellie Schneider
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Project Contribution:
National Academy Member: N

**Participant Type:** Faculty
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Project Contribution:
National Academy Member: N

**Participant Type:** Faculty
**Participant:** Melissa Karlin
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Project Contribution:
National Academy Member: N

**Participant Type:** Faculty
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Project Contribution:
National Academy Member: N

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**Participant:** Caroline Waters

**Person Months Worked:** 1.00 **Funding Support:**
Project Contribution:
National Academy Member: N

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Project Contribution:
National Academy Member: N

**Participant Type:** Other Professional
**Participant:** Amy Anderson
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Project Contribution:
National Academy Member: N

**Participant Type:** K-12 Teacher
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Project Contribution:
National Academy Member: N

**Participant Type:** K-12 Teacher
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Project Contribution:
National Academy Member: N

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**Participant:** Elizabeth Generas
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Project Contribution:
National Academy Member: N

**Participant Type:** Faculty
**Participant:** Sharath Krishna
**Person Months Worked:** 3.00 **Funding Support:**
Project Contribution:
National Academy Member: N

**Participant Type:** Other Professional
**Participant:** Kelly Bohrer
**Person Months Worked:** 3.00 **Funding Support:**
Project Contribution:

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National Academy Member: N

**International Travel:**

EGY 90 days

GHA 17 days

EGY 19 days

**International Collaboration:**

EGY

GHA

EGY

EGY

EGY

**ARTICLES:**

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**Article Title:** Securing Funding: Non-traditional Funding Opportunities Available for Small Undergraduate Teaching Institutions
**Authors:** Leanne Petry, Suzanne Seleem
**Keywords:** Department of Defense; Undergraduate Institutions; Grants; Funding Opportunities
**Abstract:** Department of Defense (DoD) grants are offered regularly for public, private and military academic institutions to serve the military mission in society [1,2] as well as enhancing the research efforts of faculty and the training of all students registered for any academically accredited institution [1,2]. The nature of these grants differs in some aspects from other national, state and other federal sources which fund basic and applied research within the scientific community.
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**Partners**

Xerion Advanced Battery Corporation
Dayton, OH USA
4
Research collaboration to train African Americans to engineer and manufacture Lithium-Ion Batteries. The outcome will be more African Americans with academic and technical skills to fill the numerous job openings at American Lithium Ion Battery factories and research centers.

The American University
Cairo, EGY
4
Research collaboration initiated on polymeric materials degradation; coordinated and established a research immersion/study abroad site for faculty, students (as part of an REU) and teachers (as part of an RET).

University of Dayton (UD)
Dayton, OH USA
4
Research collaborations exist for several funded efforts that are leveraged in support of this effort, including a funded UD-CSU SERDP effort on polymer materials, a funded UD-CSU NSF RET effort to provide global research opportunities for participants, and a currently proposed NSF REU grant; creating a graduate school pathway for CSU students to the University of Dayton.

Bowling Green State University (BGSU)
Bowling Green, OH USA
4
Research collaborations exist for several funded efforts that are leveraged in support of this effort, including a funded NSF effort at Bowling Green on polymeric and photochemical materials which provides summer undergraduate research internships for CSU students, an exchange relationship with BGSU graduate students to support research efforts at CSU, a funded UD-CSU NSF RET effort to provide global research opportunities for participants, and a currently proposed NSF REU grant; creating a graduate school pathway for CSU students to Bowling Green.

Air Force Institute of Technology (AFIT)
Fairborn, OH USA
4
Research collaboration is ongoing with AFIT to create a graduate school pathway for CSU and ROTC students to AFIT.

St. Mary's University
San Antonio, TX USA
4
Research collaboration to leverage a funded UD-CSU NSF RET effort to provide global research opportunities for participants and a currently proposed NSF REU grant; creating a graduate school pathway for CSU students to St. Mary's University.

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I certify that the information in the report is complete and accurate:
Signature: Leanne Petry
Signature Date: 7/31/23 9:23AM

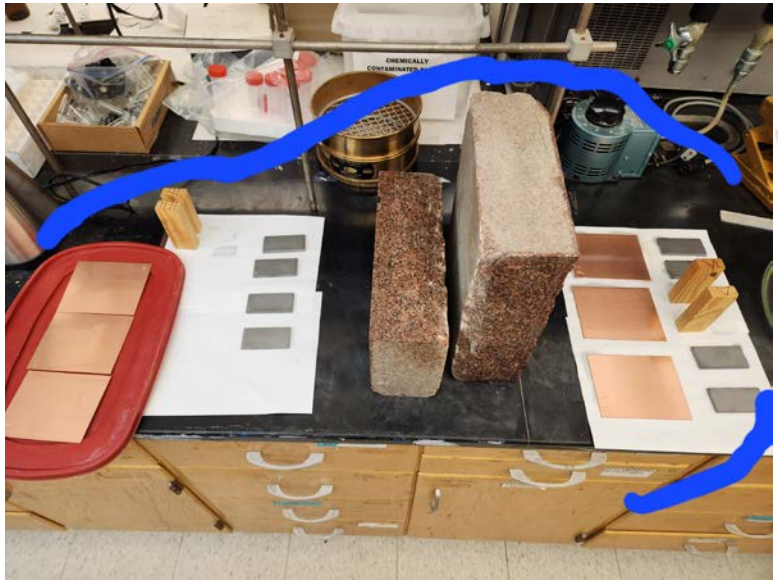
# Central State University (CSU) collaboration with Bowling Green State University (BGSU)

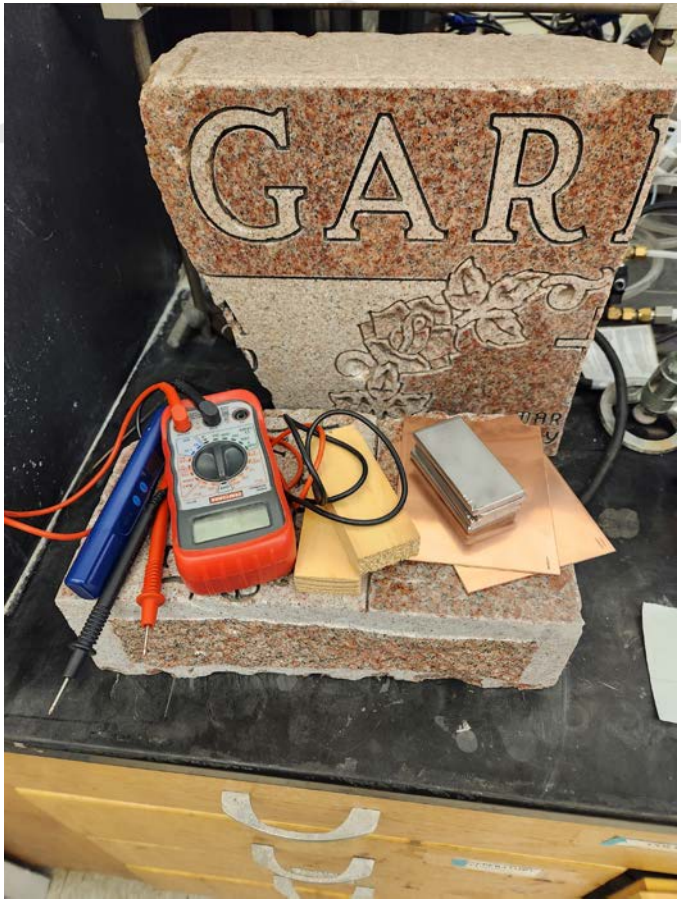
COLLEGE OF
**ENGINEERING, SCIENCE, TECHNOLOGY, AND AGRICULTURE**
1890 LAND-GRANT INSTITUTION

*Presented by:*
Leanne Petry, Ph.D. – CSU
in collaboration with
Joseph Furgal, Ph.D. – BGSU

# Q-Fog CCT 1100 Utilization

- BGSU Ph.D. student Cory Sims utilizing the Q-Fog at CSU.
  - B117 ASTM testing method
  - 240 hour exposure of two coatings and untreated surfaces of several substrates – granite headstones, pine wood, steel welding coupons, and copper plates.
- Materials selected to inspect coatings' longevity, effects on wood rot, and oxidative resistance on steel and copper.

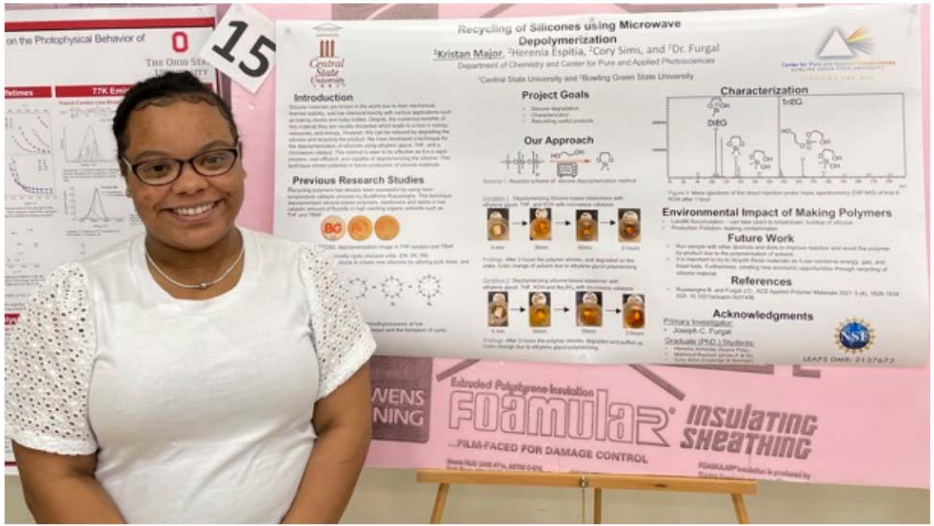




Test Specimens for ASTM B117
Exposure in CSU Q-Fog CCT 1100

# CSU Undergraduate Student Kristan Major

- Poster presentation on BGSU summer internship at the Ohio Photochemical Society meeting (Summer 2022).




- Work continued at CSU during academic year 2022-2023 in fulfillment of two-semester sequence of undergraduate research which is required of all chemistry majors at CSU. The manuscript draft is currently in progress.

# *Summer Research Experience at Bowling Green State University*

**What**: Conduct guided research with PhD students and a faculty mentor in a laboratory setting for 10 weeks this summer

**Why**: Learn what it's like to work as a PhD researcher and gain experience for a more competitive application package for jobs, and graduate/professional school! Engage your learned skills through new challenges. Includes a certificate of completion, final poster presentation, and outside research activities.

**Where**: Bowling Green State University, Bowling Green, OH within the Photochemical Sciences PhD program

**Who**: Students interested in chemistry, polymers, environmental science (water quality and soil) are encouraged to apply
Open to rising Juniors and Seniors, *3-4 will be selected*[#]

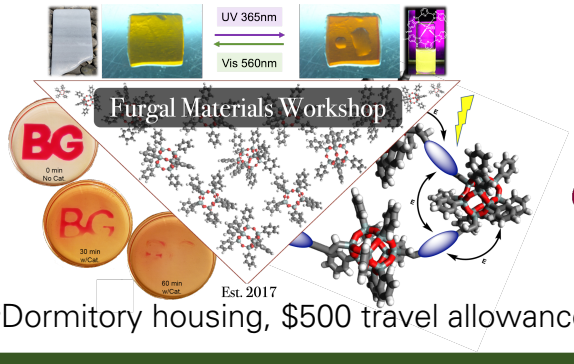
*$5,000 stipend, housing, and travel included*[$]

**When**: Starts May 23 and runs through July 29, 2022
Apply by March 15th

**How**: Send an email stating your interest, a resume, and a description of any previous research activity or questions to:

**Joseph Furgal (BGSU) furgalj@bgsu.edu and**
**Leanne Petry (CSU) lpetry@centralstate.edu**

**Check Out Lab Projects Here**[&]




BOWLING GREEN STATE UNIVERSITY
BGSU
A PUBLIC UNIVERSITY FOR THE PUBLIC GOOD.

[$]Dormitory housing, $500 travel allowance, [&]other projects available, [#]Notified by March 31

# Summer Research Experience at Bowling Green State University

BOWLING GREEN STATE UNIVERSITY
BGSU
A PUBLIC UNIVERSITY FOR THE PUBLIC GOOD.

**What**: Conduct guided research with PhD students and a faculty mentor in a laboratory setting for 10 weeks this summer

**Why**: Learn what it's like to work as a PhD researcher and gain experience for a more competitive application package for jobs, and graduate/professional school! Engage your learned skills through new challenges. Includes a certificate of completion, final poster presentation, and outside research activities.

**Where**: Bowling Green State University, Bowling Green, OH within the Photochemical Sciences PhD program

**Who**: Students interested in chemistry, polymers, environmental science (water quality and soil), physics are encouraged to apply
Open to rising Juniors and Seniors, *3-4 will be selected*[#]

*$5,000 stipend, housing, and travel included*[$]

**When**: Starts May 22 and runs through July 28, 2023
Apply by March 15th

**How**: Send an email stating your interest, a resume, and a description of any previous research activity or questions to:

**Joseph Furgal (BGSU) furgalj@bgsu.edu and**
**Leanne Petry (CSU) lpetry@centralstate.edu**

**Check Out Lab Projects Below**[&]

Central State University 1887

Furgal Lab | Sun Lab | Anzenbacher Lab | Ostrowski Lab

[$]Dormitory housing, $250 travel allowance, [&]other projects available (we will try to place you in highest areas of interest, but final selection based on funding), [#]Notified by March 31

| | |
|---|---|
| **From:** | Leanne Petry |
| **To:** | Creech, William A CIV USARMY ACC (USA); lanelle.t.shands.civ@army.mil |
| **Cc:** | Bobbie Bowling; Tina Castonguay; Bassler, Kevin J CIV USARMY ACC (USA); Leanne Petry |
| **Subject:** | RE: Request for No-cost Extension - Award No. W911NF2110144 |
| **Date:** | Wednesday, July 26, 2023 10:57:00 AM |
| **Attachments:** | RE Upcoming ARO Website Changes.msg |

Good morning,
I am seeking assitance regarding a request for a no cost extension submitted back in April 2023. An annual report is due the end of this month and the university has not received follow-up despite numerous attempts to reach out for assistance.

In June, Kevin Bassler suggested the university reach out to you for assistance as he is now serving in a different role. For your convenience, I have forwarded that correspondence below. During my conversation with him yesterday, he was kind enough to discuss allowable options for expensing the approximately $4000.00 remaining.

While all the equipment is now received onsite, installed and being used for research and research-related education, items that would assist the PI and Co-PI further with their research and research education would be technology equipment in the form of portable technology devices, including computers and tablets, that the faculty could use to interface between the laboratory instrumentation and the classroom. The ability to transition data analysis used in research into the classroom creates greater opportunities for students and local high school teachers involved in an existing research experiences for teachers grant and impending research experiences for undergraduates grant to benefit by becoming familiar with the technology and equipment in order to broaden participation and outreach efforts.

Central State University is seeking approval of this no cost extension to encumber the remaining funds for this acquisition and an extension on the date for submission of the final report until 30 September 2023. This extension would enable the encumberance of the requested technology. It was not until after implementation of the existing work and integration of the research and research-education initiatives that the additonal acquisition was discussed as being beneficial to the teaching and learning process.

Sincerely,

**Leanne Petry, Ph.D.**
*Professor, Department of Agricultural and Life Sciences*
**College of Engineering, Science, Technology, and Agriculture**
1400 Brush Row Road | Wilberforce, Ohio 45384
O: 937-376-6656
**lpetry@CentralState.edu** | **CentralState.edu**

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**From:** Tina Castonguay tcastonguay@centralstate.edu
**Sent:** Friday, June 16, 2023 10:43 AM
**To:** Creech, William A CIV USARMY ACC (USA) william.a.creech3.civ@army.mil
**Cc:** Bobbie Bowling bbowling@centralstate.edu; Leanne Petry lpetry@centralstate.edu
**Subject:** FW: Request for No-cost Extension - Award No. W911NF2110144
**Importance:** High

Good morning Mr. Creech. I hope you are doing well.

Please find attached Central State University's no cost extension request for award no. W911NF2110144.

Please note that the original request was sent on 4/13/2023 and Central State University has since been following up on the request. Per Mr. Bassler's email below, the email addresses were updated for the army and CSU was not made aware of the change. Therefore, the original requests were sent to the wrong emails.

If you need additional information, please feel free to contact me. Thank you for the continued support.

**Tina A. Castonguay**
*Associate Director*
Office of Sponsored Programs and Research
Louis Stokes Center for Academic Research and Innovation, Room 105
1400 Brush Row Road | Wilberforce, Ohio 45384
O: 937-376-6269 | F: 937-376-6598
**tcastonguay@centralstate.edu** | **CentralState.edu**

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**From:** Bassler, Kevin J CIV USARMY ACC (USA) <kevin.j.bassler.civ@army.mil>
**Sent:** Friday, June 16, 2023 10:17 AM
**To:** Creech, William A CIV USARMY ACC (USA) <william.a.creech3.civ@army.mil>; Tina Castonguay <tcastonguay@centralstate.edu>; Leanne Petry <lpetry@centralstate.edu>
**Cc:** Mccormick, Kia S CIV USARMY RDECOM ARO (USA) <kia.s.mccormick.civ@army.mil>; Shands, Lanelle T CIV USARMY ACC (USA) <lanelle.t.shands.civ@army.mil>; Bobbie Bowling <bbowling@centralstate.edu>; Taulbee, Steven C CIV USARMY DEVCOM ARL (USA) <steven.c.taulbee.civ@army.mil>
**Subject:** RE: Request for No-cost Extension - Award No. W911NF2110144

Tina- it appears you were using a decommissioned email address. The army changed all our emails addresses over from mail.mil to army.mil sometime back. You will need to resend your justification.

I can say for the REPs you need strong justification because the approver looks very carefully at these. Will Creech is the KO over this action and is covered and can assist.

Thanks!

*NOTE NEW EMAIL*: kevin.j.bassler.civ@army.mil

Kevin Bassler
Branch Chief, Branch C (ARO, ARI and RFEC)
Army Contracting Command (ACC) - Aberdeen Proving Ground (APG) Research Triangle Park Division (RTP)
PO Box 12211 Research Triangle Park, NC 27709-2211
919-549-4295, DSN: 832-4295
kevin.j.bassler.civ@army.mil

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**From:** Taulbee, Steven C CIV USARMY DEVCOM ARL (USA) <steven.c.taulbee.civ@army.mil>
**Sent:** Friday, June 16, 2023 9:52 AM
**To:** Bassler, Kevin J CIV USARMY ACC (USA) <kevin.j.bassler.civ@army.mil>
**Cc:** Mccormick, Kia S CIV USARMY RDECOM ARO (USA) <kia.s.mccormick.civ@army.mil>
**Subject:** FW: Request for No-cost Extension - Award No. W911NF2110144

Kevin,

Do you know the status of this request?

Steve

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**From:** Tina Castonguay <tcastonguay@centralstate.edu>
**Sent:** Friday, June 16, 2023 9:05 AM
**To:** Leanne Petry <lpetry@centralstate.edu>; Taulbee, Steven C CIV USARMY DEVCOM ARL (USA) <steven.c.taulbee.civ@army.mil>
**Cc:** Bobbie Bowling <bbowling@centralstate.edu>
**Subject:** [URL Verdict: Neutral][Non-DoD Source] RE: Request for No-cost Extension - Award No. W911NF2110144

Good morning.
Please advise on the status of the no-cost extension request for award no. W911NF2110144. Thank you.

**Tina A. Castonguay**
*Associate Director*
Office of Sponsored Programs and Research

Louis Stokes Center for Academic Research and Innovation, Room 105
1400 Brush Row Road | Wilberforce, Ohio 45384
O: 937-376-6269 | F: 937-376-6598
**tcastonguay@centralstate.edu** | **CentralState.edu**

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**From:** Leanne Petry <lpetry@centralstate.edu>
**Sent:** Wednesday, June 7, 2023 10:32 AM
**To:** steven.c.taulbee.civ@army.mil
**Cc:** Bobbie Bowling <bbowling@centralstate.edu>; Tina Castonguay <tcastonguay@centralstate.edu>
**Subject:** RE: Request for No-cost Extension - Award No. W911NF2110144

Good morning Steve,
Can you advise as to the status of our conversation regarding this Award Number?
I have copied my sponsored program office director, Ms. Bobbie Bowling, and Associate Director, Ms. Tina Castonguay on this correspondence.
Sincerely,
Leanne

**Leanne Petry, Ph.D.**
*Professor, Department of Agricultural and Life Sciences*
**College of Engineering, Science, Technology, and Agriculture**
1400 Brush Row Road | Wilberforce, Ohio 45384
O: 937-376-6656
**lpetry@CentralState.edu** | **CentralState.edu**

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**From:** Leanne Petry
**Sent:** Wednesday, May 31, 2023 9:49 AM
**To:** steven.c.taulbee.civ@army.mil
**Subject:** FW: Request for No-cost Extension - Award No. W911NF2110144
**Importance:** High

Good morning Steve,
Just a quick follow up to see if you have any updates for me?
Please advise,
Leanne

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**From:** Leanne Petry
**Sent:** Saturday, May 27, 2023 11:52 AM
**To:** steven.c.taulbee.civ@army.mil
**Subject:** FW: Request for No-cost Extension - Award No. W911NF2110144
**Importance:** High

Hi Steve,
Thank you for the phone call.
Attached is the email request.
Leanne

Sincerely,

Dr. Petry

Leanne Petry, Ph.D.
Professor | Department Agricultural and Life Sciences
**John W. Garland College of Science, Engineering, Technology, and Agriculture**
1400 Brush Row Road |Wilberforce, OH 45384
O: (937)-376-6656 | C: (937)-344-9466
**LPetry@centralstate.edu** | **www.centralstate.edu**

**1890 LAND-GRANT INSTITUTION**

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**From:** Tina Castonguay <tcastonguay@centralstate.edu>
**Sent:** Monday, May 1, 2023 2:11 PM
**To:** kevin.j.bassler.civ@mail.mil
**Cc:** Leanne Petry <lpetry@centralstate.edu>
**Subject:** FW: Request for No-cost Extension - Award No. W911NF2110144
**Importance:** High

Good afternoon Mr. Bassler.
Please advise on the status of the attached no-cost extension request for award no. W911NF2110144. Thank you.

**Tina A. Castonguay**
*Associate Director*
Office of Sponsored Programs and Research
Louis Stokes Center for Academic Research and Innovation, Room 105
1400 Brush Row Road | Wilberforce, Ohio 45384
O: 937-376-6269 | F: 937-376-6598

**tcastonguay@centralstate.edu** | **CentralState.edu**

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**From:** Tina Castonguay
**Sent:** Thursday, April 13, 2023 9:31 AM
**To:** kevin.j.bassler.civ@mail.mil
**Cc:** Leanne Petry <lpetry@centralstate.edu>
**Subject:** Request for No-cost Extension - Award No. W911NF2110144
**Importance:** High

Good morning.
Please find attached Central State University's request for a no-cost extension on award no. W911NF2110144.

Thank you.

**Tina A. Castonguay**
*Associate Director*
Office of Sponsored Programs and Research
Louis Stokes Center for Academic Research and Innovation, Room 105
1400 Brush Row Road | Wilberforce, Ohio 45384
O: 937-376-6269 | F: 937-376-6598
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