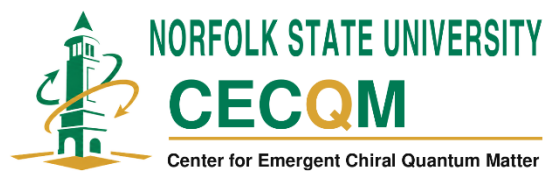


CSET Good News Report August 2026

1. Department of Physics

Physics and Chemistry Departments Awarded \$5M for a New Quantum Research Center



The Departments of Physics and Chemistry were recently awarded the CREST Center for Emergent Chiral Quantum Matter, which is a five-year, \$5M center established to explore chirality-driven quantum phenomena in materials and devices. This

will be accomplished through three synergistically integrated research thrusts:

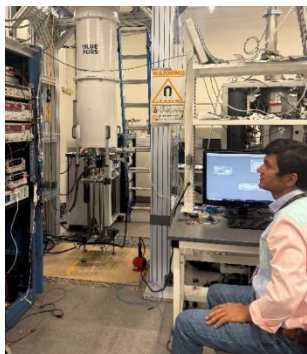
Thrust 1: *Probing Topological and Superconducting States in Chiral Crystals*, Thrust Leader Dr. Ramakanta Chapai,

Thrust 2: *Topological Spin Textures in Chiral Magnets*, Thrust Leader Dr. Sunil Karna, and

Thrust 3: *Surface Acoustic Wave (SAW)-Mediated Collective Excitations and Chirality in Magnetic Heterostructures*, Thrust Leader Dr. Doyle Temple.

These thrusts share common materials platforms, experimental and theoretical approaches, and a focus on how chirality governs the formation, manipulation, and functionality of emergent quantum states. A new quantum theory group being developed by Dr. George Miller and Visiting Faculty Fellow Dr. MiKayla Word from Sandia National Laboratories will support research across all three thrusts.

Key objectives of CECQM are to establish a Quantum Institute that will serve as the Hampton Roads Regional Quantum Hub and develop a doctoral program in Quantum Science and Engineering. The Center will also contribute to the university's goal of attaining Carnegie R2 status. Over the next five years, CECQM will recruit four cohorts of NSU faculty who are not currently working in quantum science to participate in its research programs. This effort will expand NSU's research capacity and help more faculty achieve graduate faculty status. Expanding the graduate faculty will allow the university to support more doctoral students and increase the number of doctoral graduates. These efforts will also increase NSU's research productivity and enhance proposal competitiveness.



Dr. Chapai conducting low-temperature magneto-transport measurements using a BlueFors dilution refrigerator at Argonne National Laboratory.

Dr. Ramakanta Chapai was a Visiting Faculty Fellow at Argonne National Laboratory

This summer, Dr. Chapai was awarded a highly competitive U.S. Department of Energy (DOE) Visiting Faculty Program (VFP) fellowship through the DOE. The VFP supports faculty in conducting research at DOE national laboratories while strengthening research capacity, workforce development, and student training at their home institutions.

Dr. Chapai recently returned from Argonne National Laboratory, one of the nation's premier research institutions, where he spent the summer synthesizing and studying bi-layer kagome materials—an exciting new class of correlated quantum materials.

The results from this fellowship established a strong experimental foundation for Dr. Chapai's research program at NSU, expanded opportunities for undergraduate and graduate students, and strengthened long-term collaborations with scientists at DOE national laboratories.

Dr. Sunil Karna Awarded DOE Visiting Faculty Fellowship at Jefferson Laboratory



Dr. Sunil Karna, Assistant Professor of Physics at Norfolk State University, participated in the U.S. Department of Energy Visiting Faculty Program at Jefferson Lab during Summer 2026. His collaborative research focuses on radiation-tolerant functional quantum materials for extreme environments, with potential relevance to space and advanced technologies. The collaboration also aims to establish long-term research partnerships between NSU and Jefferson Lab and create opportunities for NSU students to gain research experience at DOE national laboratory facilities. Jefferson Lab recently highlighted Dr. Karna's research and the NSU collaboration on its social media platforms.

2. Center for Materials Research

1. NSU Doctoral Student Courtney Boyd Selected for Prestigious 2026 SURA Graduate Award

The CMR is pleased to announce that **Courtney Boyd**, a doctoral student in the Materials Science and Engineering Program at the Center for Materials Research (CMR), has been selected as a recipient of the prestigious 2026 Southeastern Universities Research Association (SURA) Graduate Award. The SURA Graduate Award, formerly known as the MSI Graduate Award, recognizes outstanding graduate students beginning doctoral study at SURA member universities. The program supports SURA's commitment to reducing barriers in higher education and preparing talented students to become part of a strong and productive STEM workforce. As an award recipient, Boyd will receive **\$5,000** during the first semester of her doctoral studies.



Boyd is pursuing a Ph.D. in Materials Science and Engineering at Norfolk State University. She brings an exceptional interdisciplinary background spanning physics, computer science, emerging technologies, and scientific research. She earned an M.S. in Computer Science from Virginia State University and a B.S. in Physics from Virginia Commonwealth University (VCU).

As an undergraduate, Boyd gained research experience in nuclear physics and computational fluid dynamics at Duquesne University. Her professional experience includes serving as a

vaccine automation scientist at Thermo Fisher Scientific and as an Emerging Technology Coordinator and instructor at Richard Bland College. In that role, she taught computer science and drone piloting, developed virtual reality applications, and managed robotics technologies and equipment. She also served as a co-investigator on a National Science Foundation (NSF) Advanced Technological Education (ATE) program.

Boyd is a certified virtual and augmented reality developer and an FAA Certified Remote Pilot. She is a member of the National Society of Black Physicists and previously served as president of VCU's Society of Physics Students chapter, where she received the Physics Department's Undergraduate Service Award.

Her selection for the 2026 SURA Graduate Award reflects both her outstanding academic and professional accomplishments and the strength of the students attracted to Norfolk State University's Materials Science and Engineering doctoral program. Boyd and the other 2026 SURA Graduate Award recipients will be formally recognized during an awards ceremony on September 23, 2026, at Jefferson Lab in Newport News, Virginia, as part of the SURA Annual Members Meeting.

The Center for Materials Research congratulates Courtney Boyd on this outstanding achievement and looks forward to her continued success as she advances her doctoral research at Norfolk State University.

2. **Kanij Mehtanin Khabir**, a doctoral student at the Center for Materials Research and a member of **Dr. Noginov's research group**, successfully defended her doctoral dissertation titled "*Studies of work function modulation in plasmonic metal thin films through dielectric interfaces, molecular functionalization, and optical excitation*" on August 14th, 2026.

This work is significant because it demonstrates multiple practical approaches for controlling the work function of plasmonic Au and Ag thin films through dielectric interfaces, molecular functionalization, optical excitation, and nanoscale structural engineering. The findings provide new insight into charge redistribution and electronic interactions at metal interfaces while showing that work functions can be tuned and, in some cases, reversibly controlled by light. This capability is important for engineering next-generation electronic, optoelectronic, photovoltaic, sensing, and nanophotonic devices with tailored surface electronic properties.



3. **Dr. Messaoud Bahoura**, Professor of Engineering and Director of the Center for Materials Research, published research in *Scientific Reports*, titled "Semi-solid-state electrochromic devices based on poly (3-hexylthiophene) thin films and commercial UV-curable resins for low-power applications", *Sci Rep* (2026). <https://doi.org/10.1038/s41598-026-65698-9>.

This work demonstrates a practical approach to fast, low-power, and scalable electrochromic devices by integrating P3HT thin films with a commercial UV-curable epoxy-based gel electrolyte. The semi-solid-state design addresses limitations of liquid electrolytes, including leakage, packaging complexity, and large-area fabrication, while achieving reversible operation at ± 2 V, over 30% optical modulation at 550 nm, and a rapid ~ 60 ms switching response. The use of commercial UV-curable resins further improves manufacturability, mechanical stability, and rapid processing, making this approach promising for energy-efficient smart windows, adaptive optics, low-power displays, and scalable electrochromic technologies.

3. Department of Chemistry

- 1) **Dr. Stephen Via**, Associate Professor of Biology, through the NSU Arborists Ambassador Program, led 12 Booker T. Washington High School students in an intensive four-week summer program designed to introduce them to careers in arboriculture and equip them with foundational skills and certifications for future employment and professional growth. Throughout the program, students gained hands-on experience and classroom instruction in plant biology, plant development, species identification, and workplace safety practices.



In addition, participants explored key aspects of arboriculture, including tree cultivation, propagation, maintenance, and pathology. The program emphasized both scientific understanding and practical application, providing students with valuable exposure to the environmental and economic importance of urban forestry. By the end of the program, students had developed technical skills, earned industry-relevant certifications, and gained a clearer understanding of career opportunities in arboriculture and related environmental fields.



- 2) **Suresh C. Subedi, Ph.D.**, Assistant Professor of Biology, presented research entitled “Role of Native Microbes in Reducing Oxidative Stress Under Saline Conditions” at the Botany 2026 Conference – Biodiversity at the Boundaries, held August 1–5, 2026, in Tucson, Arizona. The presentation, co-authored with Norfolk State University undergraduate student **Aniya Rorls**, was delivered on August 5 as part of the conference’s Physiology session.

The research highlights undergraduate research at Norfolk State University and examines the role of native microbes in reducing oxidative stress in plants exposed to saline conditions, contributing to a better understanding of plant–microbe interactions and plant resilience under environmental stress.



- 3) **Dr. Suresh C. Subedi**, Assistant Professor of Biology at Norfolk State University, recently co-authored a peer-reviewed research article entitled “Succession in a Tropical Dry Forest: A Test of the Chronosequence and Inference of Community Assembly Dynamics” in *Ecology and Evolution*. The study examined forest succession in the tropical dry forests of the Florida Keys using both a chronosequence of sites and repeated long-term sampling to evaluate patterns of community assembly and vegetation change through time. The findings provide new insights into the mechanisms driving tropical dry forest succession and demonstrate that chronosequence approaches can reliably infer long-term ecological dynamics when validated with longitudinal data, contributing to a better understanding of forest development and informing conservation and restoration efforts. Citation: Carrington, M. E., M. S. Ross, and S. C. Subedi. (2026). *Succession in a Tropical Dry Forest: A Test of the Chronosequence and Inference of Community Assembly Dynamics*. *Ecology and Evolution*, 16(6), e73895. <https://doi.org/10.1002/ece3.73895>

4) Dr. Suresh C. Subedi, Assistant Professor of Biology at Norfolk State

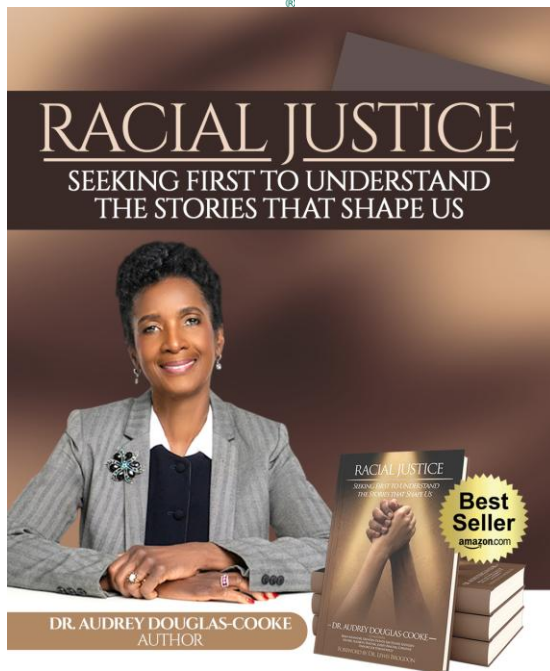
University, received a \$25,000 research subaward from Florida International University (FIU), supported by the South Florida Water Management District, to conduct research on the Loxahatchee Impoundment Landscape Assessment (LILA): Tree Island, Ridge and Slough Studies project. As Principal Investigator for Norfolk State University, Dr. Subedi will develop and apply the SORTIE-ND individual-based forest dynamics model to forecast the long-term structural development of Everglades tree islands under varying hydrologic conditions, substrate types, and planting densities. The project will use long-term field data to simulate forest growth, survival, competition, and restoration scenarios, providing science-based guidance for Everglades ecosystem restoration and adaptive management.

4. Department of Nursing and Allied Health

1) Dr. Audrey Douglas-Cooke - Published Book

Racial Justice: Seeking First to Understand the Stories that Shape Us... is a powerful and deeply personal exploration of race, faith, and the journey toward healing in America. Born out of a shared commitment to confront difficult truths, this collaborative work brings together the voices and lived experiences of individuals who embarked on a transformative journey through a racial equity program. Sparked by the global impact of George Floyd's death, this book invites readers into honest, often uncomfortable conversations about systemic injustice, privilege, and the realities that continue to shape communities across the nation.

Each chapter offers a unique perspective, revealing moments of awakening, resilience, and growth. From childhood experiences and cultural influences to pivotal national events, these narratives illuminate the complexities of race relations while challenging readers to reflect on their own assumptions and lived experiences. More than a collection of stories, this book is an invitation. An invitation to move beyond silence. An invitation to engage stories different from your own. An invitation to pursue justice through understanding, empathy, and action.



2) Dr. Philip DeMelo - Published Paper

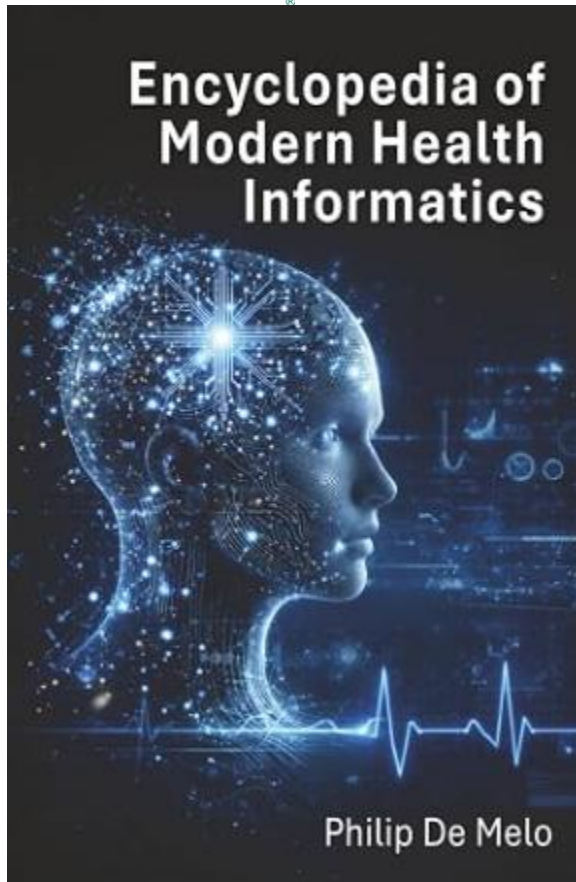
Dr. De Melo published a paper with a wonderful group of our MHI students:

De Melo, P., Jackson, M., James, A., Lawrence, K., McElveen, S., Mitchell, H., Tolbert-Abdullah, A., Wallace, A., & Waller, J. (2026). Health informatics analysis of respiratory disease disparities among diverse patient populations. *Journal of Medicine and Health Sciences*, 2(3), 103–114. <https://doi.org/10.11648/j.mhs.20260203.11>

Dr. De Melo was particularly pleased that so many of our students participated as co-authors. It is always nice when students discover that our knowledge they acquire can lead not only to assignments and deadlines, but also to their names appearing in a published journal article.

3) Dr. Philip DeMelo - Published Book

De Melo, P. (2026). *Encyclopedia of Modern Health Informatics*. Atticus Publishing. ISBN-13: 979-8-90252-216-4.



4) Dr. Leslie Hoglund- Published Paper

Published an article on a new regenerative theory for health promotion: Becker CM, Hoglund L, Chaney B, Lee JGL, Stellefson M and Davis A. (2026). [Paneugenesis: a regenerative systems hypothesis for advancing health promotion. Front. Public Health 14:1823318. doi: 10.3389/fpubh.2026.1823318](#)

5) Dr. Leslie Hoglund- Board Appointment

Elected to the American Public Health Association's Food & Nutrition Section as a Section Councilor for the next three years. My role is to help the Section Council plan, vote on, and execute operational tasks and strategic goals for the section; assist in organizing and developing scientific programs, sessions, and events for the APHA Annual Meeting; and, recruit new members, encourage involvement in committees, and foster communication across the public health community.

5. Engineering Department

- 1) **Renny E. Fernandez** (PI), Doyle Temple (Co-PI), and Hargsoon Yoon (Co-PI) acquired an MPO100 Direct-Write Laser for the NSU Cleanroom through a \$760,000 NSF Major Research Instrumentation (MRI) award. The acquisition establishes a new capability for advanced micro- and nanoscale direct-write fabrication at NSU. The addition of the MPO100 system to the NSU Cleanroom will strengthen research, student training, and innovation in advanced manufacturing, sensors, microelectronics, and related emerging technologies.

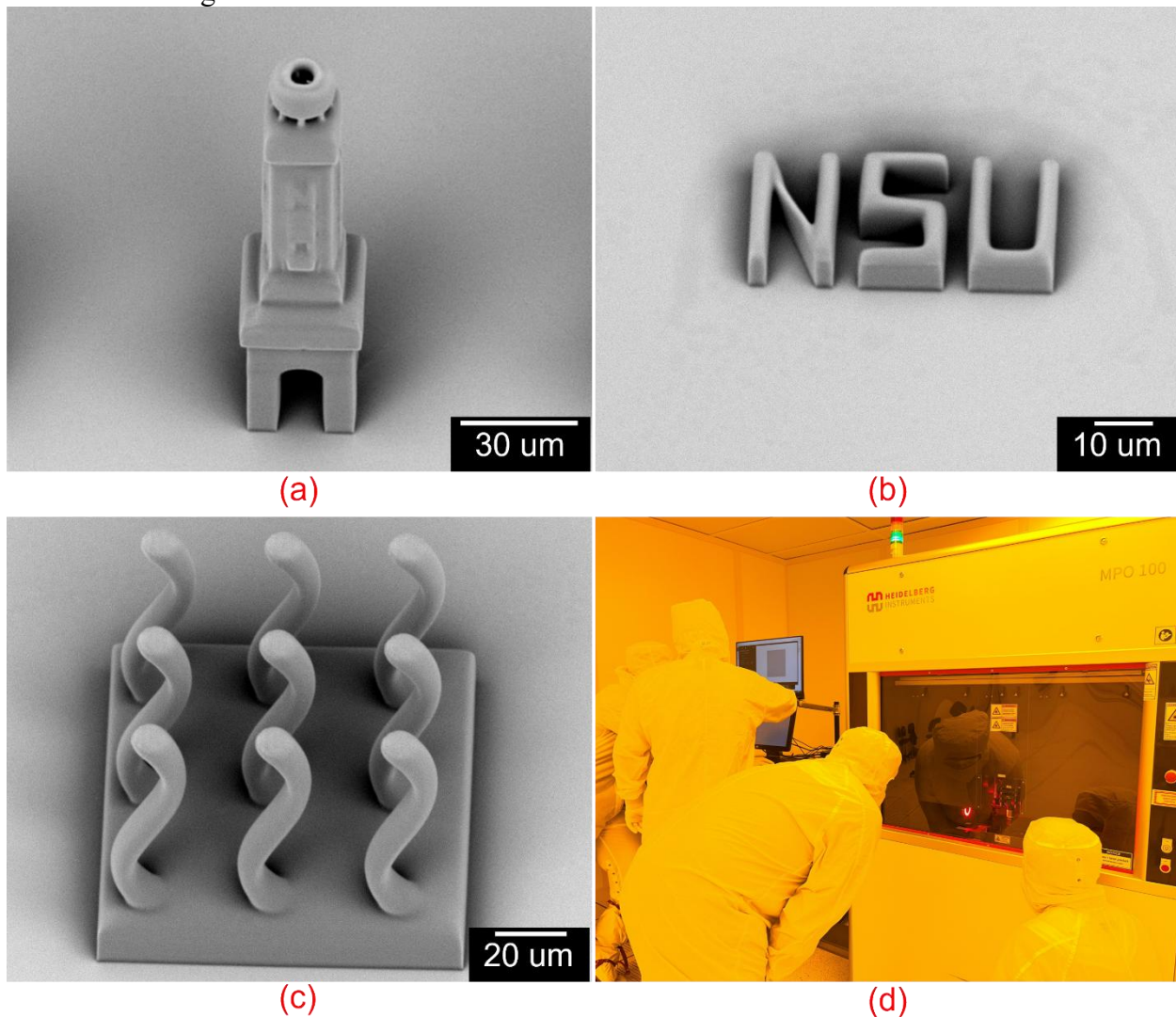


Figure 1. TPP 3D microfabrication and hands-on training using the MPO100 Direct-Write Laser at NSU Cleanroom: a) Microscale 3D NSU Bell Tower demonstrating complex microfabrication, b) Raised NSU lettering demonstrating high-resolution patterning, c) 3D nano-hair-inspired array

demonstrating high-aspect-ratio micro/nanostructure fabrication, d) Hands-on TPP 3D direct-write laser fabrication training conducted in the NSU cleanroom.

Event: Maker Fest Portsmouth

Location: Children's Museum of Virginia

- 2) The **Engineering Department** represented Norfolk State University at Maker Fest Portsmouth on August 29, 2026, at the Children's Museum of Virginia from 11:00 a.m. to 3:00 p.m. The team presented an informative project poster highlighting the system architecture, propulsion design, technical specifications, and project photographs. Digital media also showcased footage from the PEP26 competition and the department's recent electric boat race. Throughout the event, attendees expressed strong interest in the project's autonomous controls, power electronics integration, and competitive performance. Overall, Maker Fest Portsmouth provided a valuable opportunity to showcase NSU's hands-on engineering work, promote interdisciplinary STEM education, and engage with students, families, and the broader community.

