

## HIGHLIGHTS

### Astro Aggies Conduct Research at Perkins Telescope



Left to right: Athina Meli, Ph.D., senior Vanessa Jones, junior Madison Jordan, senior Payton Sanford and junior Bryce Badgett in front of the famous Perkins Telescope.

The Astro Aggies, a team of College of Science and Technology students led by Athina Meli, Ph.D., assistant professor of physics, conducted research at the Perkins Telescope Observatory (PTO), in Anderson Mesa Station, Arizona.

Meli secured a \$488,000 National Science Foundation grant for the experience, which is part of a partnership between North Carolina Agricultural and Technical State University and Boston University (BU), PTO's owner. This is the first partnership between BU and a historically Black college or university (HBCU).

Meli's grant also includes bi-yearly research trips to PTO and BU, remote telescope observations and data analysis training, poster and conference presentations on the students' research results and summer graduate and undergraduate internships at BU and PTO.

"Our amazing team of excellent physics majors made a great impression with their well-prepared research telescope-observation proposals and with their passion for astrophysics," said Meli. "They worked throughout the nights to take real astronomical data, doing imaging and spectroscopy, using the famous 1.82 m telescope."

### User-Experience Student, Top at SAS, Studies Abroad



Senior Alexa Smith sits at Aphrodite's Rock in Paphos, Cyprus.

Alexa Smith appreciates opportunities that give her room for creativity in her coding. Her interactive website, a live version of Tetris, was her most challenging and satisfying in-class project. She's a thoughtful computer graphics technology (CGT) major pursuing the user experience design (UX) concentration in the Department of Applied Engineering Technology, all while earning a 3.92 GPA.

Smith has participated in ventures outside of the classroom as well.

"I was part of the Google Tech Exchange cohort in 2021 and worked on a project to address a social issue in the community. My team and I decided to develop a solution for homelessness and created an app called 'Helping Hands.' I was responsible for the research and visual design of the project," said Smith.

"We also pitched our design to the Center for Minorities and People with Disabilities during the College of Science and Technology Innovation Challenge and earned an honorable mention.

"I created the initial designs in 2021, however, I decided to recreate them this year since I've learned more about UX design," she continued. "This project was monumental in unleashing my pursuit of a career in UX and changing my major from computer science to computer graphics."

SAS Institute's human resources team characterized Smith as the best participant at its HBCU Scholars program last year. SAS is now pursuing more CGT majors.

This summer, Smith interned at Apple as a UX design intern. She is studying abroad at the University of Nicosia, Cyprus, with classes in UX design, 3D modeling and animation, project management, cultural anthropology and Greek language and culture. She said this experience has already expanded her worldview and her perspective on her education.

Smith hopes to pursue a master's degree and potentially a doctorate in human computer interaction or technology management.



HELPING HANDS  
Housing Application

Alexa Smith and her team's user experience design from the Innovation Challenge is shown in this illustration.

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## Graduate Students Demonstrate Impact at NC ArcGIS Conference

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Students advised by Leila Hashemi-Beni, Ph.D., from left to right: Eden Wasehun, Victoria Tanoh and Gazali Agboola.

Three applied science and technology (AST) Ph.D. students presented their research at the ArcGIS conference in Asheville, North Carolina.

Gazali Agboola: "A Geospatial Analysis of Landslide Susceptibility in a Section of Western North Carolina using GIS and Machine Learning Methods," funded by the N.C. Department of Transportation

Victoria Tanoh: "Transforming Decision-Making in Acute Disasters: The Power of Knowledge Graph Databases," funded by N.C. A&T and the University of North Carolina at Chapel Hill's Looking Forward Program

Eden Wasehun: "Integrating Satellite and UAV Imagery for Enhanced Water Quality Assessment," funded by the N.C. Attorney General Environmental Enhancement Grant program

The AST Ph.D. program – the largest on campus – is expected to spin off standalone doctoral programs from some of its concentrations.

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## Assistant Professor Demonstrates Collaborative, Cutting-Edge Approach

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Ahmad Patooghy, Ph.D.

With a keen focus on cybersecurity, the Internet of Things (IoT), machine learning acceleration on IoT, and hardware design, one College of Science and Technology researcher's contributions have consistently pushed the boundaries of knowledge and innovation.

Ahmad Patooghy, Ph.D., an assistant professor in computer systems technology, is an esteemed researcher whose expertise spans a diverse range of cutting-edge fields.

His projects extend across various domains, with funding from both the National Science Foundation and the Air Force Research Laboratory.

During the past year, Patooghy helped secure approximately \$3.1 million in external funding across four distinct research and educational projects. He is the principal investigator for "A Hierarchical Machine Learning Approach for Securing of NoC-Based MPSoCs Against Thermal Attacks."

On campus, Patooghy works closely with the Center of Excellence in Cybersecurity Research, Education and Outreach and professors in his own department and across campus. Off campus, he partners with Jariet Technologies Inc. and researchers at Auburn University in Alabama, Halmstad University, Sweden, and UNC-Chapel Hill, to name just a few.

This collaborative spirit not only enhances the scope and impact of the projects, but also fosters a culture of knowledge exchange and interdisciplinary synergy. As a result, Patooghy has published these papers in the journals associated with the Institute of Electrical and Electronics Engineers and the Association for Computing Machinery:

["Securing Network-on-chips Against Fault-injection and Crypto-analysis Attacks via Stochastic Anonymous Routing"](#) with Mahdi Hasanzadehi, Amin Sarihi, Mostafa Abdelrehim, and Abdel-Hameed A. Badawy in ACM Journal on Emerging Technologies in Computing Systems, Issue 19, Article 3, pp 1-21, July 2023

["Securing IoT-based Healthcare Systems Against Malicious and Benign Congestion"](#) with Meisam Kamarei, Ahmad Alsharif and Ali Abdullah S. AlQahtani, in IEEE Internet of Things Journal

["ReNo: novel switch architecture for reliability improvement of NoCs"](#) with Zahra Shirmohammadi, Yassin Allivand, Fereshte Mozafari, Mona Jalal and Sanaz Kazemi Abharian in The Journal of Supercomputing 79, no. 3 (2023): 2801-2818



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