Apply for a paid Summer 2021 Undergraduate Research Experience with the Network for Computational Nanotechnology (NCN)

SCALE Summer 2021 Radiation Hardening Project
Radiation in outer space can adversely affect the operation and long-term performance of microelectronics. Radiation hardening is a process that makes electronic components and circuits resistant to damage or malfunction caused by high levels of ionizing radiation in this environment. Transient effects include single-event effects like memory bit flips; permanent effects include single-event latchups that prevent individual devices from operating. In this project, the student will develop a computational model to predict failures for new and emerging types of memories and logic. It will consist of models for radiation in the space environment, as well as the susceptibility of devices to various types of ionizing radiation. The end goal will be to predict failures for certain classes of devices for validation in a beam-line, which may ultimately be used to adapt off-the-shelf electronics to space applications.

Preferred majors:
• ECE, NE, ME, MSE

Required Experience, Skills and Qualities:
• Experience with programming in Python, C/C++, and/or MATLAB
• Familiarity with differential equations and introductory level physics
• Familiarity with terminology and concepts from undergraduate materials science, fluid mechanics, or electromagnetism
• Motivated and enthusiastic to learn and collaborate with others
• Curious, creative, and self-motivated

Desired Experience, Skills and Qualities:
• Enthusiasm for scientific programming
• Understanding of radiation transport and electromagnetism, or materials science
• Interest in machine learning

This program is computational in nature and will be conducted online, using nanoHUB’s resources. Research will be done with Professors Bermel (ECE) or Strachan (MSE) at Purdue University.

Online professional development seminars and technical support will be provided. Students will publish their work in nanoHUB and participate in the virtual Purdue Summer Undergraduate Research Symposium on July 29, 2021.

Program dates: May 24 – July 30, 2021
Stipend: $500 per week for full-time participation.

Qualified undergraduate students who are U.S. Citizens or Permanent Residents who have at least one term remaining before graduation are eligible to apply. Rising juniors and seniors with the desired experience are preferred, but rising sophomores are also eligible to apply.

Apply here: [https://tinyurl.com/NCN-URE-2021-Application](https://tinyurl.com/NCN-URE-2021-Application)