

**2022 CCMR sponsors Next Gen Research & Professional
Development Talks**

**The talks are open to all REU students and will take place in
700 Clark Hall
on Thursdays at 12PM EST.**

Thursday, June 30th, 12:00-1:00pm

Pushing Property Limits of Structural Materials with Additive Manufacturing

Prof. Atieh Moridi

Sibley School of Mechanical and Aerospace Engineering

Designing materials with high strength and ductility has been a longstanding challenge in materials science. The potential for property enhancement to further push the strength-ductility envelope of metallic materials is either exhausted or incremental. Therefore, drastic new strategies are needed to meet the global demand of making high performance materials. Exploiting the intrinsic properties and flexibility of additive manufacturing (AM) offers ample opportunities for integrated materials and manufacturing innovation. In this talk, I will highlight different examples of how AM enables us to access new microstructures and properties.

Thursday, July 7th, 12:00-1:00pm

Ethics Presentation

Prof. David Muller

Department Applied and Engineering Physics

Starting from a case study of scientific misconduct, the Hendrik Schön case at Bell Labs, where Dr. Muller was working that the time, the human and intellectual cost of scientific misconduct will be discussed in a group setting. The workshop will also discuss how scientists can give back to society—issues ranging from choosing research that is meaningful to conveying science to the government and society at large.

Friday, July 8th, 4:00pm – 5:00pm, via Zoom

Graduate School Panel

The Cornell Graduate Panel is being offered virtually in collaboration with the Leadership Alliance with Anitra Douglas-McCarthy, Assistant Dean for Access and Inclusion and Prof. Amal El El-Ghazaly, Electrical and Computer Engineering, along with graduate students, will present a forum on graduate school. Topics of discussion will include:

- Is graduate school for you?
- Career possibilities in materials
- Tips and tricks for graduate school admissions

Here is the website, which has more information and a link to the *registration form*:
[The Leadership Alliance 2022 Virtual Professional Development Series website.](#)

Thursday, July 14th, 12:00-1:00pm

“The World of Liquid Crystalline Materials”

Prof. Nick Abbott

Smith School of Chemical and Biomolecular Engineering

We all know of liquid crystal displays, the key components of our smart phones. But liquid crystalline materials play a much more important role in our lives than just letting us read information from the internet. This presentation will introduce the audience to key properties of liquid crystalline materials and explain why this class of materials has been adopted by nature as a preferred class (you are built from liquid crystals!). In addition, the talk will highlight recent efforts to engineer liquid crystals to make new technologies, such as chemical sensors for detecting atmospheric pollutants as well as new tools for medical research (e.g., for measuring changes in the hardness of red blood cells that accompany some diseases). No prior knowledge of liquid crystals is needed!

Thursday, July 21st, 12:00-1:15pm

Scientific Presentation Skills

Prof. Melissa Hines

Department of Chemistry and Chemical Biology

All students will attend an interactive workshop on public speaking and scientific presentation. Topics covered include: how to improve your communication skills, how to give a presentation that effectively illustrates the focus of your research, and how to avoid common pitfalls.

Thursday, July 28th, 12:00-1:00pm

“Coupling Light to Light with Materials: Tackling Challenges in Ultrafast Nonlinear Optics”

Prof. Jeffrey Moses

Department of Applied and Engineering Physics

Lasers provide the briefest of impulses we can create in the laboratory, and the discipline of nonlinear optics — the study of coupling light to light in materials — can be used to expand the ‘ultrashort’ laser toolset, with applications as diverse as high intensity laser science, information processing, and the imaging and spectroscopy of biological systems. My research team develops new concepts in ultrafast nonlinear optics that help to solve longstanding challenges for science and applications. I’ll speak about a couple of these, including mimicking laser amplification without lasing, and strong coupling of light via phonons.