College of Natural Sciences & Mathematics
UNIVERSITY OF DENVER

Physics & Astronomy Colloquium

May 7, 4:00pm, Olin 105

Dr. Ryan Muzzio
Postdoctoral Researcher,
National Renewable Energy Lab (NREL)

Surface Science as a Guide to CdSeTe Photovoltaics

CdTe-based photovoltaics (PV) in 2020 accounted for 40% of the utility scale market in the United States being solely produced by First Solar, the current CdTe record efficiency holder (23.1%). This world record was made by innovations in the front and back contacts as well as the absorber quality. These high efficiency CdTe cells are polycrystalline, doped with group-V dopants, and have a graded Se alloying making them a complex system for study. This presentation will show how surface science tools such as x-ray and inverse photoemission spectroscopy, Auger microscopy, and electron backscatter diffraction are used to guide the development of the contacts and the absorber. Specifically, the interface, chemistry, and band alignment at the front and back contacts and statistical changes in the absorber will be addressed.