

We are looking for motivated postdoctoral and graduate researchers to work on two exciting and recently-funded projects in Prof Mark Siemens' lab in the Department of Physics & Astronomy at the University of Denver.

Project 1: Optical vortex interactions

We are generating, controlling, and measuring topological fluids made purely of light. The transformative idea is to treat optical vortices, whirling phase singularities in the light field that have dark centers and quantized angular momentum, as interacting quasiparticles in an optical quantum fluid. We recently observed the emergence of quantum fluid behavior and interactions between densely-packed vortices in random light waves (i.e. laser speckle, Phys Rev Lett 122: 044301, 2019). These results suggest a world of emergent physics hidden beneath the world of linear optics that is thought to be so well-understood.

This work was recently funded by the W. M. Keck Foundation, and we are looking for graduate and postdoctoral researchers to join us!

Project 2: 2D coherent spectroscopy of perovskite photovoltaics

We are studying electron transport and relaxation in perovskite thin films. We are particularly interested to use 2DCS to track the relaxation of “hot electrons” that are initially excited far above the bandgap, and how this affects device performance. Our goal is to bridge traditional PV characterization and spectroscopy techniques and give new insight into the physics in these materials to enable further device performance improvements.

This work was recently funded by NSF (2019), and we are looking for graduate and postdoctoral researchers to join us!

Location: Denver Colorado is a beautiful place to live. The city gets over 300 days of sunshine each year, and is right at the foot of the Rocky Mountains, which makes for a great place to ski, climb, hike, bike, camp, paddleboard, kayak, and more!

For more information:

- Group website: mysite.du.edu/~msiemens/
- Or contact Mark Siemens directly: msiemens@du.edu



UNIVERSITY of
DENVER

NATURAL SCIENCES & MATHEMATICS

Siemens Lab at DU

