Daniel M. Rubin

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Education	**Northeastern University**, Boston, MA PhD in Physics 2012 - 2018 est. **University of California**, Davis, CA BSc in Physics, 2008 - 2012

Experience Graduate Research Assistant, Laboratory for Graphene Research, NEU, 2013 - Present

- Designed, constructed, calibrated, and deployed optoelectronic characterization instrument used in material characterization utilizing LabView and Python.
- Utilized quantitative computational models for optical spectroscopies of nanomaterials to validate and analyze experimental data.
- Modeled electronic structure and properties of semiconductor materials with DFT based simulation packages.
- Simulated nuclear processes in various materials using MCNP to model ionizing radiation in the design of radiation detection systems.
- Fabricated atomically thin nano-scale optoelectronic devices to study complex light-matter interaction in 2D materials using micro- and nano-lithography techniques in a clean room environment.
- Managed and maintained a Raman spectrometry user facility with users in the Physics, Chemistry, Mechanical Engineering, and Chemical Engineering departments.
- Provided training and mentoring to new graduate students and co-op students coming from various scientific disciplines.
  - Mentees have gone on to present novel research at national conferences and accept offers to continue work at the Okinawa Institute of Science and Technology.

Patents Tunable and Reconfigurable Atomically Thin Heterostructures

Anthony Vargas, Fangze Liu, Christopher Lane, **Daniel Rubin**, Ismail Bilgin, Matthew DeCapua, Arun Bansil, Swastik Kar. *U.S. Patent Application No. 62/378,345* (August 2016)

Ion and Radiation detection Devices Based on Carbon Nanomaterials and Two-Dimensional Materials

Ji Hao, Swastik Kar, Yung Joon Jung. **Daniel Rubin** *Intl. Patent Application No. US 2017/051032* (September 2017)

Publications Tunable and Laser-Reconfigurable 2D Heterocrystals Obtained by Epitaxial Stacking of Crystallographically Incommensurate Bi_2Se_3 and MoS_2

Anthony Vargas, Fangze Liu, Christopher Lane, **Daniel Rubin**, Ismail Bilgin, Matthew DeCapua, Arun Bansil, Swastik Kar. *Science Advances, 14 JUL 2017 : E1601741*

Excitonic processes in atomically-thin $MoSe_2$/MoS_2 vertical heterostructures

Victor Carozo, Kazunori Fujisawa, Rahul Rao, Ethan Kahn, Jose Cunha, Tianyi Zhang, **Daniel Rubin**, Andres de Luna Bugallo, Swastik Kar, Mauricio Terrones. 2D Materials *Awaiting Publication*

Widely-Tunable Neutral and Charged Excitons at the 2D Interface Between Metal Contacts and Monolayer Molybdenum Disulfide

Daniel Rubin, Ismail Bilgin, Swastik Kar. *Manuscript submitted, awaiting review.*

Characterization of Chalcogen Doping in Atomically thin MoS_2-$MoSe_2$ Hetero-Junctions

Ismail Bilgin and **Daniel Rubin**, Kazunori Fujisawa, Colin Casey, Aditya D. Mohite, Mauricio Terrones, Andres de Luna Bugall, Swastik Kar. *Manuscript in Preparation*

Presentations Materials Research Society Fall Meeting 2017

Contributed Talk: Control of Room Temperature Exciton Dynamics in the Contact Region of MoS_2 Field Effect Devices.

Materials Research Society Fall Meeting 2014

Contributed Talk: Synthesis and Characterization of Few-Layered Black-Phosphorus

Expertise Python, LabView/LabWindows, MATLAB, CVD, Raman Spectroscopy, Photoluminescence Spectroscopy, UV/Vis Spectroscopy, SEM, AFM, Optical/E-Beam Lithography, LATEX, Arduino