

Special topic ME598 – Nanoscale Fabrication & Characterization

AKA “There is STILL plenty of room at the bottom”

Instructor:

Arend van der Zande

Spring 2021

CRN: Lecture: 69470, Lab: 69471

Lecture: MW, 11 am –12:20 pm

Labs: F 11 am -1:50 pm

Open to all graduate students

4 credit hours



Course Description:

Nanoscale systems are important to a host of current and future technologies in energy, information, health, and environment, impacting nearly every aspect of our modern lives. This course will provide a practical understanding of state-of-the-art nanoscale fabrication and characterization, and the fundamental principles behind these advanced techniques. Lectures will introduce students to topics including top-down and bottom-up paradigms of nanofabrication, characterization of structures smaller than can be resolved with light, and select applications at the forefront of nano-research. The focus will be on two dimensional materials, which will be used as a case study to understand the broader challenges and opportunities of making and using nanoscale systems. Students will apply course concepts through labs to synthesize monolayer graphene, characterize nanoscale structure and properties, and engineer devices like graphene field effect transistors. The course will also include experimental demonstrations, guest lectures from other faculty in the field, and a literature review of a research relevant subfield with a final report and presentation.

