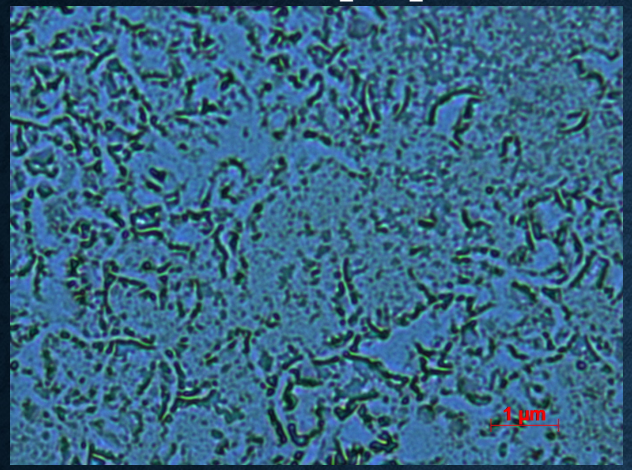
PHOTOACTIVE MATERIALS AND HYBRID DEVICES

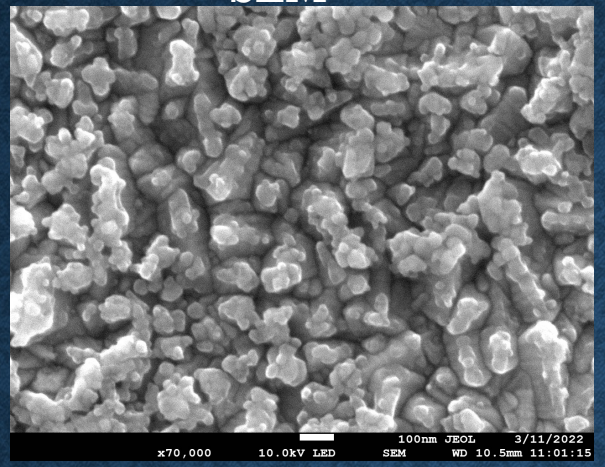
ON-GOING PROJECTS – DR. FAN'S LABORATORY

- **Thermal-Photo-Electronic Hybrid Device for Energy Harvesting**
  --- 2022 John Marshall Summer Scholar Award (awarded)
- **Sandwich Devices for Thermal Protection and Infrared Invisibility**
  --- 2022 Air Force Research Lab Summer Faculty Fellowship (awarded)
- **Multiple-Layered Coatings for Thermal Protection from Elevated Temperatures in Space**
  ---2022-2023 NASA WV Space Grant Consortium-Research Initiation Grant (pending)
- **Thermophotovoltaic Hybrid Devices for Energy Harvesting**
  ---2022-2023 NASA WV EPSCoR Research Seed Grants (pending)
- **Multilayered Metal Oxide Approach to Infrared Light Absorption for Enhanced Thermal Protection**
  ---2022-2023 NASA WV SGC Undergraduate Research Fellowship Program (pending)

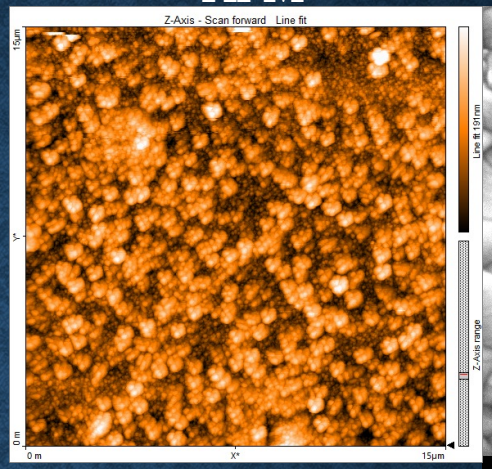
Microscope photo



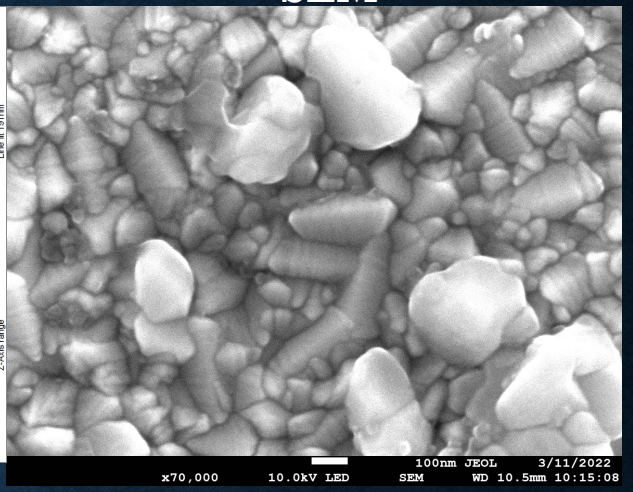
SEM



AFM



SEM

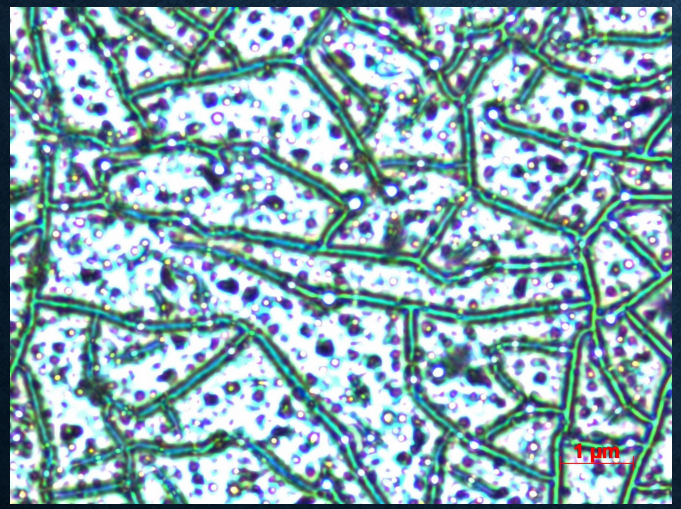


$NiTiO_3$

CuO

Microscope photos

CuO
TiO_2

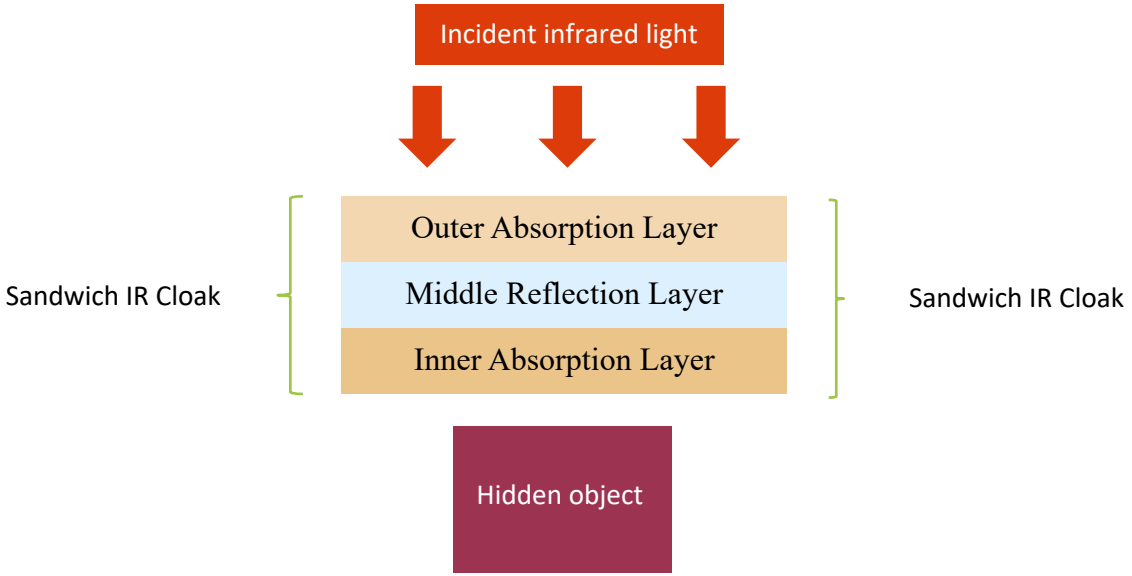


Double-Layer Structure

TiO_2
CuO

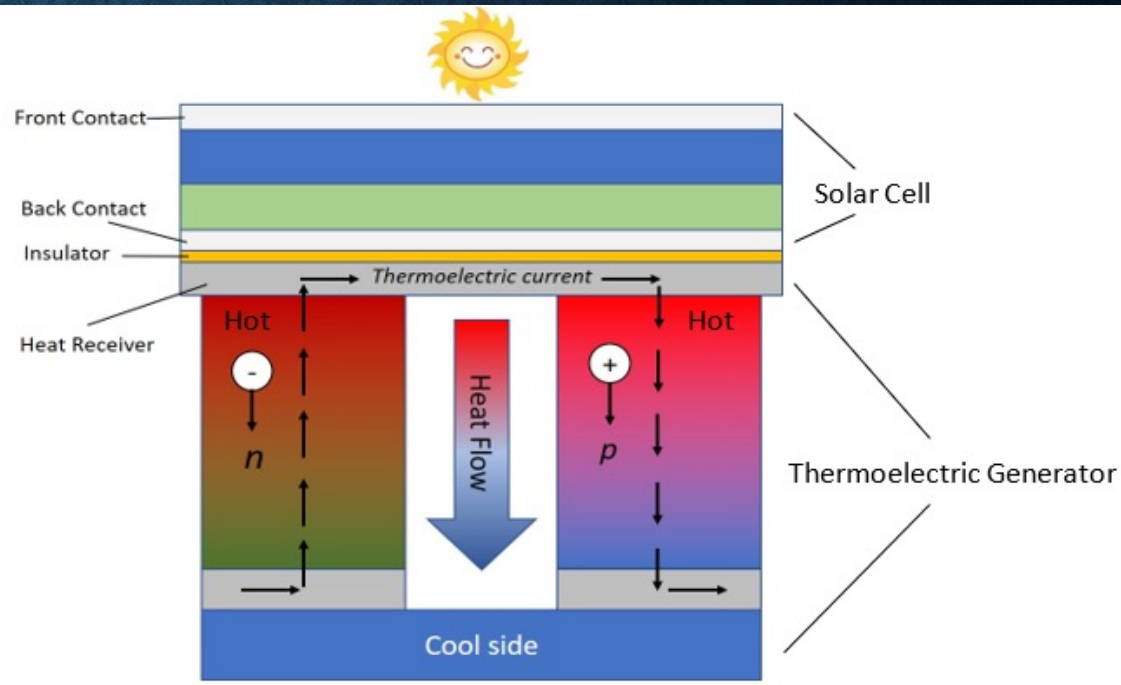
HYBRID DEVICES

Infrared Sandwich Cloaking



Schematic of a sandwich cloaking structure consists of one reflection layer sandwiched by two absorption layers to protect the hidden object from visibility of incident infrared light.

Thermophotovoltaic Hybrid Device



Schematic illustration of thermophotovoltaic hybrid device. Solar cell constructed on top of thermoelectric generator with heat flow direction along the lengthy side of the thermoelectric pillars.