

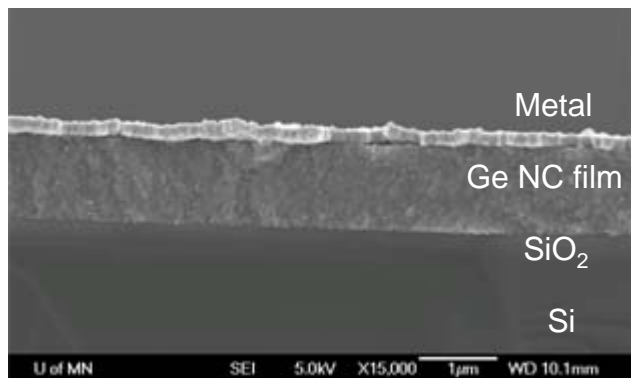
Germanium Nanocrystal Films for Photovoltaic Applications

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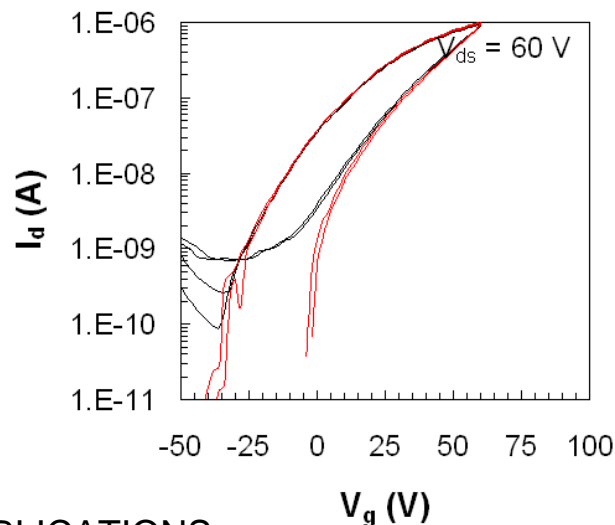
NNIN Facilities utilized: Characterization Facility & Nanofabrication Center

- GOAL: Develop germanium nanocrystal films for device applications.
 - ◆ Germanium nanocrystals are synthesized in a non-thermal plasma reactor
 - ◆ Films are formed by either transferring the crystals into solution and spin-coating, or impacted the crystals onto substrates directly downstream of the plasma



MAJOR OBSERVATIONS

- ◆ Uniform, dense films of germanium nanocrystals are formed
- ◆ As-produced films are mostly insulating; low-temperature (300° C) annealing increases the mobility to 10⁻³ cm²/Vs
- ◆ *n*-type FET devices have been fabricated and photovoltaic devices are in progress



PUBLICATIONS

- ◆ R. Gresback, Z. Holman, and U. Kortshagen, *Appl. Phys. Lett.* **91**, 093119 (2007).
- ◆ U. Kortshagen, R. Gresback, Z. Holman, R. Ligman, C.-Y. Liu, L. Mangolini, and S. Campbell, *Pure Appl. Chem.* **80**, 1901 (2008).