Abstract Submitted
for the NWS18 Meeting of
The American Physical Society

**Metastability of extreme wide bandgap semiconductor alloys.**[1] DINESH THAPA, University of Idaho, JESSE HUSO, Washington State University, MARLAYNA GARZA, University of Idaho, MATTHEW MCCLUSKEY, Washington State University, LEAH BERGMAN, University of Idaho — Two types of UV semiconductors were alloyed in varying compositions in order to change their optical properties by-design. Specifically, we combined ZnO with wurtzite structure and a band gap of 3.3 eV with MgO with rocksalt structure and a bandgap of 7.7 eV. By varying the composition of these semiconductors in a sample, one can achieve an alloy that has a band gap between 3.3 eV and 7.7 eV. This alloy system is deposited far from its thermodynamic equilibrium so to achieve a single phase alloy with the wurtzite structure. The key point of our research is the determination of the stability of the alloys. Annealing studies were performed at elevated temperatures up to 900 C to study the phase separation dynamics of the alloys and the impact of temperature on the structural phase separation and on the bandgap characteristics.

[1]We acknowledge the US Department of Energy, Office of Basic Energy Science, Division of Materials Science and Engineering Grant No. DE-FG02-07ER46386

Dinesh Thapa
University of Idaho

Date submitted: 13 Mar 2018 Electronic form version 1.4