Abstract Submitted
for the NWS18 Meeting of
The American Physical Society

High-throughput combitorial sputtering for metastable transition metal nitride alloys BETHANY MATTHEWS, Oregon State University, ELISABETTA ARCA, STEPHAN LANY, ANDRIY ZAKUTAYEV, National Renewable Energy Laboratory, JANET TATE, Oregon State University, CENTER FOR NEXT GENERATION MATERIALS BY DESIGN COLLABORATION — Sputtering is a high energy deposition technique that has many uses in industry and research and development. Recently it has been used in the high-throughput investigation of compositional variations in many material systems due to its ability to configure multiple material targets for co-sputtering at the same time. Additionally, new technologies in characterization tools allow for quick spatial mapping of these material libraries. Recently, new metastable ternary nitride structures have been predicted by theorists at the National Renewable Energy Laboratory and Lawrence Berkeley National Laboratory. Here we explore the system $Zn_xW_{1-x}N$, which is predicted to have a metastable wurtzite phase, which is different than the common antibixbyite (Zn_3N_4) and cubic (W_2N). Structure and composition were mapped by x-ray diffraction and x-ray fluorescence spectroscopy respectively. The resistivity of various compositions was examined by four point probe. Optical transmission and reflection were measured to determine optical absorption for the various absorption.

Bethany Matthews
Oregon State University

Date submitted: 23 Apr 2018 Electronic form version 1.4