Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

**Toward Controlled In-Solution Stacking of Solvent Exfoliatied 2-Dimensional Nanoflakes and Heterostructures** DALE BROWN, A. NICOLE CHANG, RICHARD LIVINGSTON, DAVID ESTRADA, Boise State University — As a result of quantum confinement, materials with one dimension confined to a few atomic diameters, including single- and few-layer graphene and transition metal dichalcogenides (TMDs), often have properties unique from those of their bulk counterparts. Included in these emergent properties is photoluminescence in thin flakes of some semiconducting TMDs. Additionally, the creation of heterostructures via the stacking of 2D materials allows for the synthesis of new materials with properties unique from those of the starting materials. While much of the research published to date in this area relies on labor intensive methods, including stacking each subsequent layer by hand to synthesize these heterostructures, some researchers have demonstrated random stacking of suspended 2D flakes in solution, with limited control over the thickness of the resulting heterostructures. By modifying the surface energy mismatch between a solvent and the suspended, exfoliated 2D materials therein, we aim to demonstrate the ability to actively control the propensity for and duration of stacking in liquid suspensions of 2D materials.

David Estrada
Boise State University

Date submitted: 14 Nov 2014 Electronic form version 1.4