

# Symposium on Applications of Sum Rules and Scaling in Nonlinear Optics

ASRS-NLO 2014

Washington State University, Pullman, WA, August 12-13, 2014

## Order of Presentations

### Symposium Times

Tuesday August 12, 2014 10:00am to 5:00pm

Wednesday August 13, 2014 9:00am to 5:00pm

NOTE: breaks will be scheduled between talks and for lunch whenever the spirit moves us.

### PROGRAM

There are no set times for the lectures; but, will be presented in the order below (from basic to applied). Impromptu 10 minute "tutorials" are encouraged if topics arise that need deeper explanations.

#### Computational Trickery

- "The Finite-difference time-domain Simulation of the Schrödinger equation," Dennis Sullivan, University of Idaho, ID
- "Using a GPU for ultrafast solutions to the Schrödinger Equation," Jared Aurentz, Washington State University, WA
- "Using a Dyson Series approach for calculating the cascading response with virtual intermediate photons," Sean Mossman, Washington State University, WA
- "FeyPy: A Python package for visualizing and calculating nonlinear optical properties," Adam Goler, Washington State University, WA

#### Applications of the theory of the nonlinear-optical response to abstract systems

- "Optimizing the nonlinear susceptibility by variations of the potential energy function in the Schrodinger Equation," David S. Watkins, Washington State University, WA
- "What features of a potential yield a large nonlinear response," Timothy Atherton, Tufts University, MA
- "Using Monte Carlo sampling and sum rules to study the nature of the hyperpolarizability," Mark C. Kuzyk, University of Oregon, OR
- "Topological and geometrical scaling of Quantum Graphs in a nutshell," Rick Lytel, First Degree Innovation, CA

- "Relativistic corrections to sum rules and effects near the fundamental limits in one dimension," Nathan Dawson, Case Western University, OH

#### **Applications of scaling and limits to the nonlinear-optical response of molecules**

- "Optimized intrinsic and specific polarizabilities for large third-order susceptibilities in high optical quality single-component materials," Ivan Biaggio, Lehigh University, PA
- "Design engineering of organic non-linear optical molecules," Jacqueline M. Cole, Cavendish Laboratory, University of Cambridge, UK
- "Universal scaling in nonlinear optical molecules," Xavier Perez-Moreno, Skidmore College, NY
- "Cross-Conjugation as a Design Motif for Non-Linear Optical Molecules," Meghana Rawal, University of Washington, WA
- "Multi-scale modeling of ONLO chromophores," Andreas F Tillack, University of Washington, WA
- "Quantitative 2-photon spectroscopy: what the measurements can tell us," Aleks Rebane, Montana State University, MT
- "Photophysics of organic semiconductors: from single molecules to optoelectronic devices," Oksana Ostroverkhova, Oregon State University, OR

#### **Applications of the scaling and limits the nonlinear-optical response of molecules**

- "Outreach Ideas for inherently complex research,"

#### **Conclusion and Farewell**

- "What I learned today," Mark G. Kuzyk