Physical Principles of Mesoscopic Chemical Design

Organizers: Aaron Rury and Blake Simpkins
March 24-26, 2026

Tuesday PM

Georgia World Congress Center | B306
Mesoscopic Delocalization and Sensing of Organic Excitations
B. Simpkins, *Organizer* | A. Rury, *Organizer, Presiding*

2:00 PM. Correlating electronic disorder to structural dynamics in polymer semiconductors. **N. Stingelin**

2:30 PM. Study of polyaniline and polythiophene in photo-redox electrolyte gels for hybrid photovolatic supercapacitor devices. **R. Amirabad**, A. Takshi, P. Kumar Biswas

2:50 PM. Controlling photochemical pathways in cesium lead bromide thin films using mesoscopic structural engineering. **E. Odewale**, I. Boateng, T. Gamagedara, M. Mudalige, A. Rury

3:10 PM. Break.

3:20 PM. Strong coupling in vibrational sensing and infrared nanophotonics. **J.D. Caldwell**

3:50 PM. Toward a rational understanding of polariton chemistry. **W. Xiong**

4:20 PM. Break .

4:30 PM. Supramolecular design for emissive Infrared Moleular Aggregates. **J.R. Caram**

4:50 PM. Design and engineering peptide-based materials and colloidal systems. **J.G. Saven**

5:20 PM. Nanoscale spatial patterning of quantum emitters integrated with silicon-based quantum devices. **X. Luo**, R. Macfarlane, M. Bathe

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Wednesday AM

Georgia World Congress Center | B309
Mesoscopic Behavior of Inorganic Systems
A. Rury, B. Simpkins, *Organizers* | A. D. Dunkelberger, *Presiding*

8:00 AM. Large language model-guided optimization of two-dimensional material synthesis. **X. Mao**

8:20 AM. Entangled photon generation with metal-organic frameworks. **Y. Colon**

8:50 AM. Break.

9:00 AM. Polymer-templated high-performance all-inorganic conformal coatings for multifunctional applications. **E. Shevchenko**, D. Berman, S. Guha

9:30 AM. Chirality and topology. **X. Wang**

10:00 AM. Break.

10:10 AM. Emergent complexity of chiral nanostructures. **N. Kotov**

10:40 AM. Optical chirality generated by exciton-polaritons. **T.W. Odom**

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Wednesday PM

Georgia World Congress Center | B309
Mesoscopic Behavior of Inorganic Systems
A. Rury, B. Simpkins, *Organizers* | E. Odewale, *Presiding*

2:00 PM. Harnessing Moiré potentials to shape charge and excitons. **X. Li**

2:30 PM. Van der waals THz photonics and photophysics. **T. Handa**

3:00 PM. Superlattice design of two-dimensional electrochemical and magnetic materials. **D. Bediako**

3:30 PM. Break.

3:45 PM. Interplay between chiro-optical and spin transport properties in chiral CdSe quantum dots. **E. Shiby**, R. Sun, B. Bloom, J. Albro, D. Sun, D.H. Waldeck

4:05 PM. Tuning spin relaxation in two-dimensional ligand-perovskite type-II heterostructures. **A. Soni**, L. Wang

4:25 PM. Modulating Spin dynamics through Structure: Property tuning in lead Halide Perovskites. **L. Wang**

4:45 PM. Low-Dimensional hybrid organochalcogenide semiconductors. **W.A. Tisdale**

Physical Principles of Mesoscopic Chemical Design

Organizers: Aaron Rury and Blake Simpkins
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Thursday AM

Georgia World Congress Center | A315
Mesoscopic Properties of Cavity Polaritons
A. Rury, *Organizer* | B. Simpkins, *Organizer, Presiding*

8:00 AM. Opening Remarks.

8:05 AM. Polariton transport dynamics under the collective light-matter coupling regime. **P. Huo**

8:35 AM. All SMILES for molecular polariton condensates. **V. Menon**

9:05 AM. Break.

9:15 AM. Modelling the P3HT microcavity reflectance spectrum: Introducing a partitioning scheme for treating large disordered chromophore ensembles. H. Haghshenas, **M. Arias Contreras**, A. George, A. Musser, F. Herrera, F. Spano

9:45 AM. Polariton-enhanced heat transfer in polymer thin films. **N. Giebink**

10:15 AM. Break.

10:25 AM. Tuning vacuum fields to suppress static and dynamic disorder. N. Bussell, Y. Nah, **M. Delor**

10:55 AM. When do polaritons behave as optical filters? **J. Yuen-Zhou**

11:25 AM. Predicting and exploiting cavity effects in nonlinear vibrational spectroscopies. **A.D. Dunkelberger**, C.G. Pyles, A.P. Fidler, J. Owrutsky, B. Simpkins

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