

Suggested Graduate Student Seminar Topics—08 Feb 2006

Arduengo

Bakker

- 1) Mesoporous materials: Synthesis, structure, and properties
- 2) CIDEP and CIDNP: What can spin selective combination tell us about reaction mechanisms?
- 3) Hyper-polarized xenon NMR spectroscopy
- 4) Structures of surfactant aggregates on surfaces

Blackstock (stet)

- 1) Molecule-based magnetic materials and high-spin molecules
- 2) STM of organic molecules
- 3) New advances in supramolecular chemistry
- 4) New advances in crystal engineering

Cassady (new)

- 1) Gas phase acid/base properties of biomolecules as studied by mass spectrometry
- 2) Analysis of carbohydrates by mass spectrometry
- 3) Applications of Fourier transform mass spectrometry
- 4) The use of the Hadamard transform in chemistry
- 5) Simplex and other procedures for optimizing experimental parameters

Dixon

Jennings

Kispert (stet)

- 1) Photochemical solar energy conversion in surfactant vesicles
- 2) Femtosecond studies of Photosystem II reaction centers
- 3) Photoelectrochemistry of thin-film electrodes
- 4) Spectroscopic and electronic properties of quantum dots

Metzger (new)

- 1) One-dimensional band theories of conducting polymers
- 2) Langmuir-Blodgett approaches to directed electron transfer in biological systems
- 3) Organic quasi-one-dimensional metals superconductors
- 4) Practical uses of carbon nanotubes
- 5) Metal nanowires in anodic nanoporous alumina
- 6) Single-molecule transistors: do they amplify?
- 7) Nitric oxide as a neurotransmitter: why did it take so long to find it?
- 8) Extraterrestrial molecules
- 9) Creation science confronts Darwinian evolution: where is "the beef"?
- 10) Jan Hendrick Schoen and his deceit: a modern Dr. Jekyll and Mr. Hyde
- 11) The chemistry of memory: how little we know

Nikles

- 1) Organic nonlinear optical materials
- 2) Colossal magnetoresistance in LaCaMnO₃ perovskite phases: Synthesis, structure, properties, and transport mechanisms
- 3) Prevention of iron corrosion by amine-quinone polymers
- 4) Lanthanide porphyrin complexes with sandwich structures
- 5) Discotic liquid crystal phases
- 6) Photoresist chemistry for X-ray lithography
- 7) New magnetic particle chemistry for ultrahigh density magnetic tape
- 8) On the reliability of the materials used in metal particle magnetic tape

Redding

- 1) In vitro evolution systems for catalytic polynucleotides
- 2) Molecular motors: Myosin & kinesin
- 3) Non-enzymatic deamidation of proteins: Possible role in aging
- 4) The proteasome system for regulated protein degradation

Rogers (new)

- 1) Green Chemistry in Industrial Context
- 2) Ionic Liquids as New Materials not Solvents
- 3) Polymorphism in the Pharmaceutical Industry
- 4) f-Element Chemistry: Pure and Applied
- 5) Crystal Engineering
- 6) New Materials from Biological Sources
- 7) Advanced Textiles, Fibers, and Composites

Shaughnessy (new)

- 1) Gold-catalyzed reactions
- 2) C-H activation and functionalization
- 3) Cross-coupling reactions of alkyl halides
- 4) DNA-based nanomechanical devices
- 5) Renaissance of Pd(II)-catalyzed oxidation chemistry
- 6) Concurrent tandem catalysis

Street

- 1) Thin film modeling of catalysts
- 2) Novel surface analytical techniques
- 3) Hybrid organic/inorganic nanocomposites
- 4) Heterogeneous catalysis: Carbon-carbon bond-breaking and bond formation
- 5) Heterogeneous catalysis: CO oxidation
- 6) The Photoreduction of Metal Ions
- 7) Charge Transport Across the Metal-Molecule Interface

Szulczewski

- 1) Synthesis and self-assembly of nanoparticle arrays
- 2) Analytical techniques for mercury analysis

Thrasher

- 1) Electrochemical fluorination
- 2) The element displacement principle
- 3) Stereochemical nonrigidity in organometallic chemistry
- 4) Density function theory: An alternative ab initio method
- 5) Advances in ion chromatography

Timkovich

- 1) Silicon NMR: Application to silicates
- 2) Reverse polarization detection in NMR: High sensitivity heteronuclear NMR
- 3) Biosynthesis of Vitamin B12

Vincent (new)

- 1) Paramagnetic NMR as a probe of the active sites of metalloenzymes
- 2) Single-molecule magnets
- 3) Transport of copper, iron, and manganese

Woski

- 1) Combinatorial chemistry
- 2) Electron transfer through DNA

Of course, students may always approach an individual professor and either suggest their own topic, or discuss in common a new topic not listed above