**Materials Research Outreach Symposium 2004,**
**Preliminary list of participating UCSB faculty and areas of interest**

| Faculty | Department(s) | Interests |
|---|---|---|
| Bazan, Gui | Chemistry, Materials | Organometallic catalysis of olefin polymerizations, synthesis of conjugated emissive polymers and their use in new devices, water soluble conjugated polymers for optically amplified biosensors. |
| Cheetham, Tony | Materials, Chemistry | Synthesis, characterization and properties of inorganic materials, including molecular sieve catalysts, optical and magnetic systems. |
| Chmelka, Brad | Chemical Engineering | Macromolecular-based synthesis of porous inorganic and organic materials, guided by NMR spectroscopy. |
| Deming, Tim | Materials, Chemistry | Organometallic catalysis for synthesizing artificial polypeptides and their block and multiblock copolymers. |
| Fredrickson, Glenn | Chemical Engineering, Materials | Theory and simulation of macromolecular structure and properties; copolymers (block and random), phase transitions and surfaces and interfaces. |
| Fygenson, Deborah | Physics | Biological materials and superstructures, biomimetic nanoscale architectures and mechanics. |
| Hansma, Helen | Physics | Atomic force microscopy and force spectroscopy of biomaterials ranging from DNA-protein complexes to spider webs. |
| Hansma, Paul | Physics | Building scanning probe microscopes such as new Atomic Force Microscopes that use small cantilevers and the application of these microscopes to problems of biological and medical importance. |
| Heeger, Alan | Physics, Materials | Semiconducting and metallic polymers, polymeric light emitting diodes and lasers, semiconducting polymers for photovoltaic applications and water soluble luminescent polymers for use in biosensors. |
| Israelachvili, Jacob | Chemical Engineering, Materials | Thin films, membranes and microstructured fluids, surface and interface phenomena, adhesion, friction, colloid systems, surface forces, bio-interactions and bio-lubrication. |
| Jaeger, Luc | Chemistry, BMSE | RNA tectonics and programmable biomaterials. Computing supra-molecular architectures with RNA. Design and engineering of programmable self-assembling bio-composite nano-architectures. Deciphering the language of RNA assembly and folding for playing Lego with RNA. |
| Kramer, Ed | Materials, Chemical Engineering | Microscopic and molecular aspects of fracture of polymers, diffusion in polymers, polymer surfaces, interfaces and thin films. |
| Lange, Fred | Materials | Colloidal processing, microcontact printing of polymeric, metallic and ceramic materials, precursor solution routes to epitaxial thin films, mechanics of structural ceramics. |
| Leal, Gary | Chemical Engineering | Fluid mechanics of polymers: drop dynamics, break up and coalescence, reactive polymer processing, molecular rheology of polymer fluids. |
| McFarland, Eric | Chemical Engineering | Photo-electrocatalysis and catalysis associated with energy production, fuel cells, photovoltaics, chemoelectronic sensors. |

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|---|---|---|
| Morse, Daniel E. . | Inst. for Collab. Biotechnologies; Molec. Bio.; BMSE | Biomolecular materials; biotechnology and biosenors. Proteins, genes and molecular mechanisms controlling nanofabrication of semiconductors and high-performance composites; novel routes to nanofabrication based on biomolecular mechanisms. "Silicon Biotechnology". |
| Moskovits, Martin | Chemistry | Spectroscopy, surface chemistry, and the chemistry and fabrication of nanowires. |
| Pincus, Phil | Physics, Materials, BMSE | Soft condensed matter theory; biomembranes; Coulomb effects in biophysics; conjugated polymers; polyelectrolytes; hydrophobic effect. |
| Pine, David | Chemical Engineering, Materials | Photonic crystals, rheology of emulsions, particle suspensions, and other complex fluids; light scattering and diffusing wave spectroscopy. |
| Safinya, Cyrus | Materials, Physics, BMSE | Biomolecular materials, membranes, proteins, DNA and peptide complexes - X-ray and optical characterization methods. |
| Scott, Susannah | Chemical Engineering, Chemistry | Heterogeneous catalyst design for selective oxidation, metathesis, oligomerization and polymerization of olefins; use of surface organometallic chemistry to define catalytic mechanisms and catalyst support characterization; chemical vapor deposition and atomic layer epitaxy of catalytic thin films. |
| Seshadri, Ram | Materials | Development of methods for scaling up the preparation of soluble oxide and chalcogenide nanoparticles, and structure-property relations in advanced inorganic materials, particularly magnetic materials. |
| Soh, Hyongsok (Tom) | Mechanical Engineering | BioMEMS technology; cellular & molecular detection and manipulation, parallel operation of micromachined devices. |
| Spaldin, Nicola | Materials | Theoretical study of the fundamental physics behind novel and potentially useful phenomena in magnetic and electronic materials. Development of theoretical and computational methods; design and optimization of materials for specific device applications. |
| Stemmer, Susanne | Materials | Structure-Property Relationships, Thin Oxides, Scanning Transmission Electron Microscopy. |
| Stucky, Galen | Chemistry, Materials | Synthesis of inorganic materials using complex fluid and polymeric templates and substrates. |
| Tirrell, Matthew | Chemical Engineering, Materials | Surface modification, functionalization of surfaces, adhesion, friction, lubrication, biomaterials development, bioadhesion. |
| Waite, Herb | Marine Science Institute & MCDB | Biochemical and mechanical characterization of biological materials from various marine organisms. |
| Zasadzinski, Joe | Chemical Engineering, Materials | Encapsulation of drugs, macromolecules, DNA, etc. using biocompatible coatings. Phase behavior and morphology of lipid and protein bilayers and monolayers. |