

Biomolecular Materials and Processes

Fall meeting of the Solid State Sciences Committee

October 19, 2006

Beckman Center, Irvine, CA

Committee Membership

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Statement of Task

- Identify the most compelling questions and the emerging scientific opportunities at the interface between biology and condensed matter and materials research—the biomolecular domain.
- Suggest educational, programmatic, and institutional strategies to best meet the identified opportunities.
- Consider connections to national priorities including health care, security, workforce, economic and other societal needs.

Past Reports on Biomolecular Materials

- **Role of Theory in Biological Physics and Materials, *Report of an NSF-sponsored workshop, 2004***
 - Co-chaired by Michael Thorpe, Arizona State University, and Anders Carlsson, Washington University in St. Louis
- **Capturing the Full Power of Biomaterials for Military Medicine, *National Research Council Workshop, 2004***
 - Chaired by James Anderson, Case Western Reserve University
- **Biomolecular Materials, *Report of the BESAC workshop, 2002***
 - Co-Chaired by Mark D. Alper, LBNL, UC Berkeley, and Samuel I. Stupp, Northwestern University
- **Opportunities at the Intersection of Nanoscience, Biology and Computation, *JASON, The MITRE Corporation, 2002***
 - Chaired by Ellen Williams, University of Maryland College Park
- **Biomolecular Self-Assembling Materials, *National Research Council, 1996***
 - Chaired by Philip Pincus, UC Santa Barbara
- **Hierarchical Structures in Biology as a Guide for New Materials Technology, *National Research Council, 1994***
 - Chaired by David Tirrell, University of Massachusetts

BMAP Workplan

- Three committee meetings
 - 1st meeting: March 16-17, 2006
 - 2nd meeting: June 18-19, 2006
 - 3rd meeting: November 29-30, 2006
- Identifying scientific opportunities for the field
- Zeroth draft of final report prepared
- Report review in December/January
- Target release of approved prepublication draft is spring 2007

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CENTRAL THEME: LEARN BIOMOLECULAR MECHANISMS AND HARNESS UNDERSTANDING OR INSPIRATION TO CREATE MATERIALS - BIOINSPIRED?

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BMAP Final Report

- Timely: New NSF program on Biomaterials starting in FY07
- Added value: looks at basic research conducted across all federal funding agencies
- Considering the role and contribution of probes and tools in conducting basic research in the field
- Considering the broad picture of infrastructure and human resources