

Program Balance
Materials Research Science and Engineering Centers
Interdisciplinary Research Groups (IRGs)
December 2007

#	Institution	IRG#	Topic	IRG leader(s)	Nano
Biomolecular / Biomimetic Materials					
1	UCSB	1	Programmable bonding, biomimetic synthesis	Luc Jaeger, Matthew Tirrell	
2	Caltech	2	Patterns, gradients, signals in soft biomaterials	David Tirrell	
3	U. Chicago	4	Bio-interfacial science	Brian Kay, Milan Mrksich	
4	Harvard U.	2	Materials and techniques at cellular scales	George Whitesides	
5	U. Penn	3	Synthetic programmable membranes	William DeGrado, Daniel Hammer	
6	U. Penn	4	De novo synthetic protein modules	Kent Blasie, Leslie Dutton	
7	Penn State	2	Molecular and nanoscale motors	Vincent Crespi	x
8	U. Southern Mississippi	1	Response driven systems: proteins, polymers, colloids	Sabine Heinhorst	
9	Stanford/IBM/ UC Davis/Berkeley	2	Structure and Dynamics of Poly and Bio Materials at Interfaces	Marjorie Longo, Eric Shaqfeh	
10	U Washington	1	Genetically engineered biomimetic materials	Mehmet Sarikaya	
11	U. Wisconsin	3	Nanostructured interfaces to biology	Nicholas Abbott, Paul Bertics	x
Coatings / Ceramics					
12	Northwestern	1	Multifunctional oxides and ceramic systems	Vinayak Dravid, E64 Bruce Wessels	
13	U. Penn	5	Oxide-based hierarchical interfacial materials	James Kikkawa, I-Wei Chen	
Condensed Matter Phenomena					
14	U. Chicago	1	Fluid flow: from singularities to microscales	Leo Kadanoff, Ka Yee Christina Lee	
15	U. Chicago	3	Jamming and slow relaxation far from equilibrium	Tom Rosenbaum, Sid Nagel	
16	U. Colorado	1	Ferroelectric liquid crystals	Noel Clark	
17	Cornell U.	4	Atomic membranes as molecular interfaces	Paul McEuen and Jiwoong Park	x
18	U. Maryland	1	Low-dimensional interfaces	Ellen Williams	x
19	U. Maryland	2	Multifunctional magnetic oxides	Dennis Drew	x
20	Penn State	3	Electrons in confined geometries	Moses Chan	x
21	Princeton U.	1	Magnetism and transport in correlated systems	Robert Cava, N.P. Ong	x
22	Yale U	1	Complex oxides and their interfaces	Charles Ahn	x
Magnetics / Ferroelectrics / Spintronics					
23	U. Alabama	1	Transport in nanostructured magnetic materials	Arunava Gupta	x
24	Cornell U.	1	Controlling electrons at interfaces	Hector Abruna, Dan Ralph	x
25	Johns Hopkins U.	1	Magnetic nanostructures, spintronics	Chia-Ling Chien	x
26	U. Minnesota	3	Magnetic heterostructures, spintronics	Paul Crowell	x
27	U. Nebraska	1	Nanomagnetism: interactions and applications	David Sellmyer	x
28	U. Nebraska	2	Spin polarization and transmission	Christian Binek	x
Nanostructures, Nanoparticles					
29	U. Alabama	2	Materials for information storage	David Nikles	x
30	Columbia U.	1	Structural integrated films containing nanoparticles	Louis Brus, Irving P. Herman	x
31	Cornell U.	2	Photonic building blocks from multiscale materials	Alex Gaeta, Ulrich Wiesner	x
32	MIT	3	Electronic transport in mesoscopic systems	Moungi Bawendi	x
33	U. Minnesota	P	Nanoparticle based materials	Uwe Kortshagen	x
34	Penn State	1	Chemical patterning and nano structures	Paul Weiss	x
Mechanics of Materials					
35	Brown U.	1	Stress in thin films and small scale structures	Eric Chason	x
36	Brown U.	2	Multiscale mechanics of complex microstructures	Allan Bower	
37	Caltech	3	Advanced struct. materials with nanoscale architectures	Bill Johnson	x
38	Carnegie Mellon U.	1	Grain boundaries, metals / ceramics; simulations	Greg Rohrer	

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39	Harvard U.	1	Mutiscale mechanics of films and interfaces	Frans Spaepen	
40	Princeton U.	3	Adhesion, deformation, and transport in small structures	Antoine Kahn, T. Kyle Vanderlick	x
	Soft Materials, Colloids				
41	Harvard	3	Interface-mediated assembly of soft materials	Michael Brenner	
42	U. Penn	1	Filamentous networks and structured gels	Shu Yang, Arjun Yodh	
	Polymers				
43	UCSB	3	Soft cellular materials	Gary Leal, Glenn Frederickson	
44	U. Mass	1	Tailored interfaces	Tom Russell	x
45	U. Mass	2	Structural materials in supercritical fluids	James Watkins, Thomas McCarthy	
46	U. Mass	3	Aqueous polymer assembly	D.A. Hoagland, M. Muthukumar	
47	MIT	2	Nanostructured polymer assemblies	Anne Mayes	x
48	U. Minnesota	1	Microstructured polymers	Marc Hillmyer	x
49	Northwestern U.	2	Nanostructured polymer blends and composites	Ken Shull	x
50	U. Penn	2	Functional cylindrical assemblies	Dennis Discher, Andrea Liu	x
51	Princeton U.	2	Guided self assembly	Thanos Panagiotopoulos, Rick Register	x
52	U. Southern Mississippi	2	Response driven films and film formation	Charles Hoyle	
53	Stanford/IBM/ UC Davis/Berkeley	1	Synthesis and application of nanostructured materials	R. Hedrick, R. Waymouth	x
	Semiconductors / Photonics / Organic electronics				
54	UCSB	2	Oxides as semiconductors	Jim Speck, Chris Van de Walle	
55	UCSB	4	Nanostructured materials by molec beam epitaxi	Arthur Gossard, Elliot Brown	x
56	Caltech	1	Ferroelectric photonic materials	Kaushik Bhattacharya	
57	MIT	1	Microphotonic materials and structures	John D. Joannopoulos	x
58	U. Minnesota	2	Crystalline organic semiconductors	Daniel Frisbie	
59	Northwestern U.	3	Plasmonics and Molecular Based Electronics	Rick Van Duyne	x
60	U. Oklahoma / U. Arkansas	1	Collective properties of nanostructure arrays	Greg Salamo	x
61	U. Oklahoma / U. Arkansas	2	Mesosopic narrow gap systems	Michael Santos	x
62	Penn State	4	Optical Metamaterials	Theresa Mayer	
63	U. Wisconsin	1	Si based nanomembrane materials	Max Lagally, Robert Blick	x
64	U. Wisconsin	2	Functional organic-inorganic electronic interfaces	Tom Kuech, Robert Hamers	x
65	Stanford/IBM/UC Davis/Berkeley	3	Directed Nano-assemblies and Interfaces for Advanced Electronics	Zhenan Bao, J. Campbell Scott	x
	Synthesis / Processing				
66	U. Chicago	2	Hierarchically assembled molecular materials	Philippe Guyot-Sionnest, Stephen Sibener	
67	Cornell U.	3	Dynamics of growth of complex materials	George Malliaras and David Muller	
68	MIT	4	Solid-state portable power sources	Gerbrand Ceder	