

**Program Balance  
Materials Research Science and Engineering Centers  
Interdisciplinary Research Groups (IRGs)  
September 2008**

Institution	IRG#	Topic	IRG leader(s)	Biomaterials	Hard Condensed Matter Phenomena	Electronic Materials	Energy / Sustainability	Magnetism / Spintronics	Mechanics of Materials	Multiferroics	Nanotechnology	Photonic Materials	Polymers	Soft Condensed Matter / Materials
Brandeis	1	Emergent Properties Resulting from Constraints	Robert Meyer, Bulbul Chakraborty	x							x			x
Brown U.	1	Stress in thin films and small scale structures	Eric Chason						x		x			
Brown U.	2	Multiscale mechanics of complex microstructures	Allan Bower						x					
Caltech	1	Ferroelectric photonic materials	Kaushik Bhattacharya									x		
Caltech	2	Patterns, gradients, signals in soft biomaterials	David Tirrell	x										
Caltech	3	Advanced struct. materials with nanoscale architectures	Bill Johnson						x		x			
Carnegie Mellon U.	1	Grain boundaries, metals / ceramics; simulations	Greg Rohrer						x					
Colorado Sch. Of Mines	1	Materials for Next Generation Photovoltaics	Reuben Collins				x				x	x		
Colorado Sch. Of Mines	2	Advanced Membranes for Energy Applications	Andrew Herring				x				x		x	
Columbia U.	1	Structural integrated films containing nanoparticles	Louis Brus, Irving P. Herman								x			
Cornell U.	1	Controlling electrons at interfaces	Hector Abruña, Dan Ralph			x					x			
Cornell U.	2	Dynamics of growth of complex materials	George Malliaras and David Muller								x			
Cornell U.	3	Atomic membranes as molecular interfaces	Paul McEuen and Jiwoong Park		x						x			x
Cornell U.	4	Controlling Complex Electronic Materials	Darrell Schlom, Kyle Shen					x		x	x			
Georgia Tech	1	Epitaxial Graphene	Walt de Heer			x					x			
Harvard U.	1	Micromechanics	Frans Spaepen						x					
Harvard U.	2	Droplet Templated Materials	Michael Brenner											x
Harvard U.	3	Active Soft Materials	George Whitesides	x										x
Johns Hopkins U.	1	Magnetic nanostructures, spintronics	Chia-Ling Chien					x			x			
MIT	1	Design of Nanomaterials for Electrochemical Energy Storage and Conversion	Yang Shao-Horn, Gerbrand Ceder				x				x			
MIT	2	Mechanomodifiable Heteronanomaterials	Christine Ortiz, Robert Cohen						x		x		x	
MIT	3	Multimaterials Multifunctional Nano-structured Fibers	Yoel Fink, Marin Soljacic								x	x		
MIT	Init.	Frustrated and Correlated Materials	Daniel Nocera, Young Lee		x									
MIT	Init.	Engineering Living Cells via Nanomaterials	Darrell Irvine, Michael Rubner	x							x			
New York U.	1	Colloidal Architectures	Paul Chaikin, Marcus Weck											x
Northwestern U.	1	Multifunctional oxides and ceramic systems	Vinayak Druvid, Bruce Wessels							x				
Northwestern U.	2	Nanostructured polymer blends and composites	Ken Shull								x		x	

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Northwestern U.	3	Plasmonics and Molecular Based Electronics	Rick Van Duyne			x					x	x		
Ohio State U.	1	Towards Spin-preserving, Heterogeneous Spin Networks	P. Christopher Hammel and Ezekiel Johnston-Halperin					x			x			
Ohio State U.	2	Double Perovskite Interfaces and Heterostructures	Leonard Brillson, Patrick Woodward					x		x				
Penn State U.	1	Molecular and nanoscale motors	Vincent Crespi								x			
Penn State U.	2	Charge and Spin Transport in Quasi-1D Nanowires	Moses Chan		x			x			x			
Penn State U.	3	Electromagnetically-coupled Nanostructures	Theresa Mayer			x					x	x		
Penn State U.	4	Strain-enabled Multiferroics	Venkatraman Gopalan							x				
Princeton U.	1	Electronic Materials with Triangular Lattice and Dirac Excitations	Robert Cava, N. Phuan Ong		x	X					x			
Princeton U.	2	Design and Control of Buried Active Molecular Materials Interfaces	Antoine Kahn, Lynn Loo											X
Princeton U.	3	Integrated Self-assembled Nanostructures	Thanos Panagiotopoulos, Rick Register								x			X
Princeton U.	4	Quantum Control in Semiconductor Nanostructures	Ali Yazdani, Jason Petta		X			X			x			
Stanford/IBM/ UC Davis/Berkeley	1	Synthesis and application of nanostructured materials	R. Hedrick, R. Waymouth								x		x	
Stanford/IBM/ UC Davis/Berkeley	2	Structure and Dynamics of Poly and Bio Materials at Interfaces	Marjorie Longo, Eric Shaqfeh	x									x	
Stanford/IBM/UC Davis/Berkeley	3	Directed Nano-assemblies and Interfaces for Advanced Electronics	Zhenan Bao, J. Campbell Scott			x					x			
U Washington	1	Genetically engineered biomimetic materials	Mehmet Sarikaya	x										
U. Alabama	1	Transport in nanostructured magnetic materials	Arunava Gupta					x			x			
U. Alabama	2	Materials for information storage	David Nikles					x			x			
U. Chicago	1	Jamming and slow relaxation far from equilibrium	Heinrich Jaeger, Aaron Dinner											x
U. Chicago	2	Dynamic Transitions of Material Sheets	Thomas Witten, Wendy Zhang						x					
U. Chicago	3	Rational Design of Nanoparticle and Molecule-based Functional Materials	Stephen Sibener, Eric Isaacs								x			
U. Chicago	4	Macroscopic Quantum Coherence	Kathryn Levin, Woowon Kang		x			x						
U. Colorado	1	Liquid Crystal Frontiers	Noel Clark		x						x			

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U. Maryland	1	Low-dimensional interfaces	Ellen Williams		x	x					x			
U. Maryland	2	Multifunctional magnetic oxides	Dennis Drew		x					x	x			
U. Mass	1	Directed Polymer-based Assemblies	Thomas Russell, Thomas McCarthy				x				x		x	
U. Mass	2	Polymer Surface Instabilities	Alfred Crosby, Jonathan Rothstein						x		x		x	
U. Mass	Init.	Polymer Surfaces for Bacterial Control	David Hoagland, James Watkins										x	
U. Mass	Init.	Amphiphilic Polyelectrolytes	Todd Emrick and M. Muthukumar	x									x	
U. Minnesota	1	Engineered Multiblock Polymers	Marc Hillmyer								x		x	
U. Minnesota	2	Organic Optoelectronic Interfaces	Daniel Frisbie			x					x	x		
U. Minnesota	3	Magnetic Heterostructures	Paul Crowell					x			x			
U. Minnesota	4	Nanoparticle Based Materials	Uwe Kortshagen				x				x			
U. Nebraska	1	Nanoscale Magnetism: Structures, Materials, and Phenomena	David Sellmyer					x			x			
U. Nebraska	2	Magneto-electronic Interfaces and Spin Transport	Christian Binck					x		x	x			
U. Oklahoma / U. Arkansas	1	Collective properties of nanostructure arrays	Greg Salamo			x				x	x	x		
U. Oklahoma / U. Arkansas	2	Mesoscopic narrow gap systems	Michael Santos			x		x			x	x		
U. Penn	1	Filamentous networks and structured gels	Shu Yang, Arjun Yodh											x
U. Penn	2	Functional cylindrical assemblies	Dennis Discher, Andrea Liu								x		x	
U. Penn	3	Synthetic programmable membranes	William DeGrado, Daniel Hammer	x										
U. Penn	4	De novo synthetic protein modules	Kent Blasie, Leslie Dutton	x			x							
U. Penn	5	Oxide-based hierarchical interfacial materials	James Kikkawa, I-Wei Chen							x				
U. Southern Mississippi	1	Response driven systems: proteins, polymers, colloids	Sabine Heinhorst	x									x	
U. Southern Mississippi	2	Response driven films and film formation	Charles Hoyle										x	
U. Wisconsin	1	Si based Nanomembrane materials	Max Lagally, Robert Blick			x					x			
U. Wisconsin	2	Functional organic-inorganic electronic interfaces	Tom Kuech, Robert Hamers			x					x			
U. Wisconsin	3	Nanostructured interfaces to biology	Nicholas Abbott, Paul Bertics	x							x			
UCSB	1	Programmable bonding, biomimetic synthesis	Song-I Han, Matthew Tirrell	x							x		x	
UCSB	2	Oxides as semiconductors	Jim Speck, Chris Van de Walle			x				x				
UCSB	3	Soft cellular materials	Gary Leal, Glenn Frederickson								x		x	

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UCSB	4	Nanostructured materials by molec beam epitaxy	Arthur Gossard, Chris Palmstrom			x					x			
Yale U	1	Complex oxides and their interfaces	Charles Ahn		x	x		x		x	x			
				12	10	16	6	14	8	10	50	8	15	9
<b>31 MRSECs</b>														
<b>73 IRGs + 4 Initiatives</b>														