Advanced Manufacturing in the Civil, Mechanical and Manufacturing Innovation (CMMI) Division

Research leading to transformative advances in manufacturing and building technologies, with emphases on efficiency, economy, and sustainability

Advanced Manufacturing Cluster in CMMI

1468: Manufacturing Machines and Equipment
ZJ Pei

1788: NanoManufacturing
Khershed Cooper

1786: Manufacturing Enterprise Systems
Edwin Romeijn

8092: Materials Engineering and Processing
Grace Hsuan, Mary Toney, TBD

Manufacturing Machines and Equipment
PD: ZJ Pei

MME supports fundamental research leading to improved manufacturing machines and equipment, and their application in manufacturing processes. Key goals of the program are to advance the transition of manufacturing from skill-based to knowledge-based activities, and to advance technologies that will enable the manufacturing sector to reduce its environmental impacts.

Emphasis areas:

- enable energy manufacturing
- laser processing
- joining processes
- additive manufacturing machines and processes

Nanomanufacturing
PD: Khershed Cooper

NM supports fundamental research and education on design and manufacturing at the nanoscale.

Emphasis Areas:

- advancing manufacturing technology using production systems to fabricate nanostructures and to integrate these into micro-devices and meso- and macroscale systems.
- enable manufacturing scalability leading to commercial production
    - including improvements in component reliability, yield, efficiency and affordability

SNM initiative

Manufacturing Enterprise Systems
PD: Edwin Romeijn

MES supports research on design, planning, and control of operations in manufacturing enterprises. Research is supported that impacts the analytical and computational techniques relevant to extended enterprise operations and that offer the prospect of implementable solutions.

Emphasis Areas:

- analytical and computational tools for optimal planning, monitoring, control, and scheduling of manufacturing and distribution operations, including maintenance and repair
- methods that incorporate increasingly rich enterprise process and product information and models, methods that address sustainability, and methods that incorporate characteristic uncertainty and risk

Materials Engineering and Processing
PDs: Grace Hsuan, Mary Toney, TBD

SMM + MPM + MSE = MEP

MEP supports fundamental research addressing the interrelationship of materials processing, structure, properties and/or life-cycle performance for targeted applications. Research proposals should be driven by the performance or output of the material system relative to the targeted application(s).

- Materials in bulk form or focus on special zones such as surfaces or interfaces that are to be used in structural and/or functional applications are appropriate
- All material systems are of interest including polymers, metals, ceramics, semiconductors, composites and hybrids thereof
- Analytical, experimental, and numerical studies are supported and collaborative proposals with industry (GOALI) are encouraged

GOALI: Grant Opportunity for Academic Liaison with Industry

Grant Opportunities for Academic Liaison with Industry (GOALI) promotes university-industry partnerships by making project funds or fellowships/traineeships available to support an eclectic mix of industry-university linkages. Special interest is focused on affording the opportunity for:

- Faculty, postdoctoral fellows, and students to conduct research and gain experience in an industrial setting;
- Industrial scientists and engineers to bring industry's perspective and integrative skills to academe; and
- Interdisciplinary university-industry teams to conduct research projects.

This solicitation targets high-risk/high-gain research with a focus on fundamental research, new approaches to solving generic problems, development of innovative collaborative industry-university educational programs, and direct transfer of new knowledge between academe and industry. GOALI seeks to fund transformative research that lies beyond that which industry would normally fund.

Emphasis of Materials Within NSF

Objectives
Of
Research

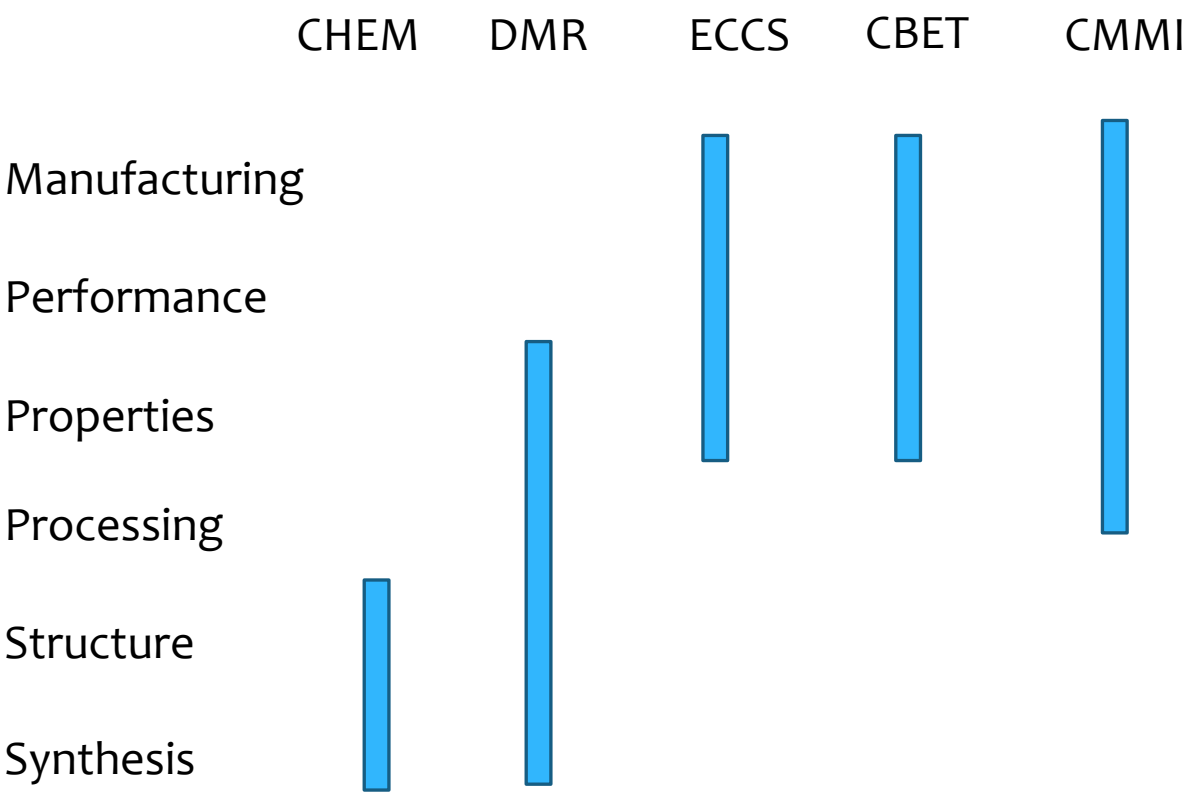
CMMI – processing, performance, scale-up

CBET – transport, performance

ECCS – devices & systems, performance

DMR - discovery of materials, synthesis, characterization

CHEM - synthesis



Other NSF Funding Opportunities

* Design of Engineered Material Systems (DEMS)
* Design of Materials to Revolutionize and Engineer the Future (DMREF)
* Scalable Nanomanufacturing (SNM)
* National Robotics Initiative (NRI)
* Computation and Data-Enabled Science and Engineering (CDS&E)
* Cyber-Enabled Materials, Manufacturing, and Smart-Systems (CEMMSS)
* Sustainable Chemistry, Engineering and Materials (SusChEM)
* Research at the Interface of the Biological, Mathematical, and Physical Sciences, and Engineering (BioMaPS)

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