Quick Briefing: NSF & DOE Sponsored

Materials Research Decadal Survey

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Where Materials Begin & Society Benefits!

Why?

- DMR 2015 COV recommended a NAS study
- Within last decade -NAS studies focused only on Condensed Matter and Materials Physics – *MATERIALS RESEARCH IS MUCH BROADER!*

- Major changes in materials research in last decade and accelerating
- Major increase in international investments in materials research

What?

Assess the progress and achievements in Materials Research (MR) over the past decade;

Identify:

- Principal changes in the R&D landscape for MR
- MR areas that offer promising investment opportunities, new directions, major scientific gaps;
- Fields in MR ready to be support by other disciplines, applied research, or industry;
- Broad Impacts of MR on emerging technologies, national needs, and science;
- Challenges that MR may face over the next decade and how to address those challenges;

Evaluate

- recent trends in investments in MR in the U.S. relative to international investment

How?

Laure Greene, Chief Scientist, NHMFL

Matt Tirrell, Univ of Chicago & ANL

Tom Lubensky, Univ of Penn

NAS Study Co-Chairs

In addition to five full-committee meetings, the committee engaged in extensive information gathering, including:

1. A review of relevant published literature;
2. Invited presenters at the committee's public meetings;
3. Sustained engagement with the materials research communities; and
4. If the committee decides, commissioned papers.

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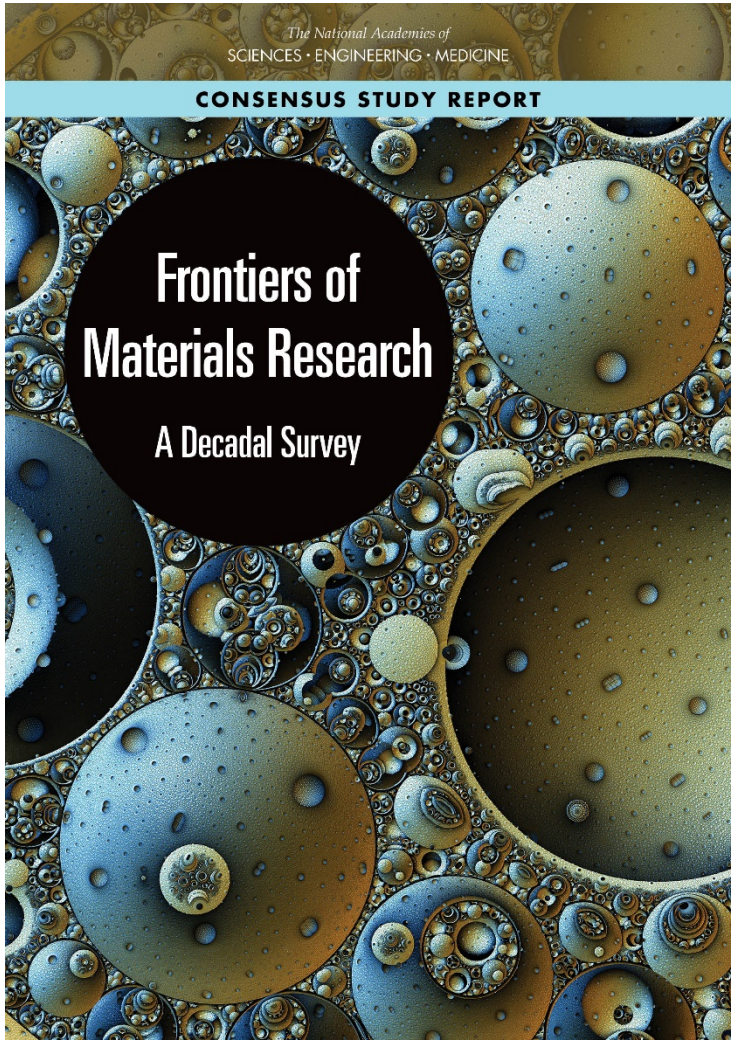

- Industry perspectives
- Research community input
- Strongest influencers: *MGI & NNI*
- NEW this decade: *topological materials, high entropy alloys, 2D materials, vitrimers, architected materials, additive manufacturing….*

Broad Reccomendations:

- Increased coordination across all sectors –especially industry
- Support for Interagency Polymer Decadal Study (POL/NSF lead)
- Mid-scale infrastructure
- Sustainable Material Development
- Computation and Data Science
- High-throughput synthesis/characterization
- **Quantum Materials**
- Hybrid/Composite Materials
- Advanced Manufacturing

THANK YOU!

Questions?

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