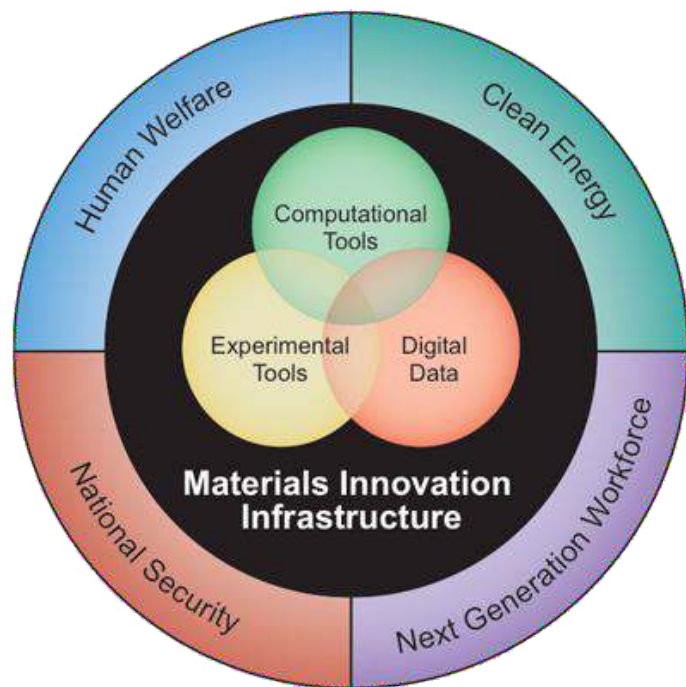


MGI Goals



- Leading a culture shift in materials-science research to encourage and facilitate an integrated team approach
- Integrating experiment, computation, and theory and equipping the materials community with advanced tools and technique
- **Making digital data accessible**
- Creating a world-class materials-science and engineering workforce that is trained for careers in academia or industry

Response:

Registries

Repositories

FAIR¹ Data Principles and MGI Effort at NIST

| Data / Resource ⇒ | Findability | Accessibility, Interoperability, and Reusability |
|--|---|---|
| Semantic Interoperability Efforts | ² Shared Materials Vocabulary for Shared Meaning of Materials Resources | Focused voluntary effort by small work groups, including: <ul style="list-style-type: none">• High Throughput Experimental Materials Science• Atomistic Simulation of Grain Boundary Properties• CALPHAD input data ³ Participating groups deploying interoperable data repositories via the Materials Data Curation System |
| Semantic Interoperability Efforts | ² Shared XML Schema (XSD) for Shared Representation of Resource Metadata | Shared XML Schemas (XSD) for Shared Representation of: <ul style="list-style-type: none">• Common concepts in materials science (e.g., miller index)• Common measurement techniques (e.g., XRD)• Common simulation techniques (e.g., MD)• Samples; enable discovery of all digital artifacts (i.e., data) associated with material samples |

[1] Wilkinson, M. D., Dumontier, M., Aalbersberg, Ij. J., Appleton, G., Axton, M., Baak, A., et al. (2016). The FAIR Guiding Principles for scientific data management and stewardship. *Scientific Data*, 3, 160018.

<https://doi.org/10.1038/sdata.2016.18>

[2] <https://www.rd-alliance.org/groups/working-group-international-materials-resource-registries.html>

[3] <https://mgi.nist.gov/materials-data-curation-system>

Outlook

- NIST/MGI promises complementary strengths to EMMO effort
- NIST/MGI offers off-the-shelf public domain tools for operating
 - Materials Resource Registry: <https://mgi.nist.gov/materials-resource-registry>
 - Interoperable Data Repository: <https://mgi.nist.gov/materials-data-curation-system>
- EMMO effort may help bridge the gap between materials groups building interoperable domain repositories