National Laboratory Day

Dan Ginosar

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October 9, 2019

Dan Ginosar
CMI Deputy Focus Area Area Lead
Mission & Strategy

**Mission:**
Accelerate the development of technological options that assure supply chains of materials essential to clean energy technologies – enabling innovation in US manufacturing and enhancing energy security.

Critical materials (a) provide essential and specialized properties to advanced products or systems, (b) have no easy substitutes, and (c) are subject to supply risk.

**Strategy:**
- Diversify our sources;
- Develop substitutes to the existing materials;
- Drive better use of the existing supplies through efficient manufacturing, recycling and re-use.
### Critical Materials in Energy Systems

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<th>REEs *</th>
<th>Li</th>
<th>Co</th>
<th>C**</th>
<th>Ga</th>
<th>In</th>
<th>Mn</th>
<th>V</th>
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</table>

- = Selected rare earths: Nd, Pr, Dy, Sm (magnets); La, Ce (catalysts)

** = Battery-grade graphite
CMI: One integrated team with complementary capabilities
Accomplishments

- 287 Refereed Publications
- 120 Invention Disclosures
- 350 CMI Participants*
- 56 Patent Applications
- 10 Awarded Patents
- 8 Technology Licenses
- 4 R&D 100 Awards
- 50 CMI Affiliates*
- 25 CMI Team Members*

* - since inception
is Positioned to Address the World’s Energy and Security Challenges

Nuclear S&T
- Advanced reactor design and optimization
- Nuclear fuels and materials
- Fuel cycle technologies
- Light water reactor fleet sustainability

Advanced Test Reactor
- Steady state neutron irradiation of materials and fuels
  - Naval Nuclear Propulsion Program
  - Industry
  - National laboratories and universities

Materials and Fuels Complex
- TREAT – Transient testing
- Analytical laboratories
- Post-irradiation examination
- Advanced characterization
- Fuel fabrication
- Space nuclear power and isotope technologies

Energy and Environment S&T
- Advanced transportation
- Environmental sustainability
- Clean energy
- Advanced manufacturing
- Biomass

National and Homeland Security S&T
- Critical infrastructure protection and resilience
- Nuclear nonproliferation
- Physical defense systems
Laboratory accelerates materials design, discovery and deployment by transitioning science to applied science to technology commercialization.
LLNL’s mission is to strengthen national security through world-class science, technology, and engineering.
ORNL’s distinctive facilities bring thousands of R&D partners from across the globe each year - Building Technologies Research and Integration Center; Carbon Fiber Technology Facility; Center for Nanophase Materials Sciences; High Flux Isotope Reactor; Manufacturing Demonstration Facility; National Transportation Research Center; Spallation Neutron Source; Oak Ridge Leadership Computing Facility.