

Rare Earths in Technology: Working with them, working around them

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It is almost impossible to avoid headlines concerning rare-earth elements (REE), their supply, their sourcing, and their geopolitical impact. Indeed, the International Energy Agency suggests that Net Zero Emissions goals can only be met via achievement of a ten-fold increase in REE extraction by 2030. This presentation will provide an overview of what REEs are, why they are of intense global interest, and what pathways are being explored to mitigate their outsized influence on technology. In particular, new approaches to enhance the supply of advanced permanent magnets will be briefly examined; these materials, which have been predicted to approach an estimated 2027 market value of \$36.9 billion^[1], are required to achieve 21st-century aspirations for e-mobility, robots and drones, among other applications.

1. <https://magneticsmag.com/permanent-magnet-market-will-rise-to-nearly-37-billion-by-2027/>



Brief Bio: Laura H. Lewis is Distinguished University and Cabot Professor of Chemical Engineering and Professor of Mechanical and Industrial Engineering at Northeastern University in Boston, MA. Prior to her Northeastern University position, she was a research group leader and Associate Department Chair in the Nanoscience Department of Brookhaven National Laboratory (BNL). Concurrently, she was the Deputy Director of the BNL Center for Functional Nanomaterials, a DOE national user facility to provide researchers with state-of-the-art capabilities to fabricate and study nanoscale materials.

Laura's research focuses on investigating the materials factors at the atomic level that provide functionality to magnetic and electronic materials, with particular expertise in advanced permanent magnets. She has participated on a number of advisory panels, including as a member of the Scientific Advisory Board of the Critical Materials Institute (a DOE Energy Innovation Hub). She is a Delegate of the U.S. Technical Advisory Groups to develop supply chain and sustainability standards to ISO TC298 (Rare Earths) and ISO TC333 (Lithium), on behalf of the American National Standards Institute (ANSI).

Laura, a Fellow of the IEEE, was Conference Editor of the IEEE Transactions on Magnetics (2008 – 2018) and was Chair of the IEEE Magnetics Society Technical Committee (2017-2019). She is also a Fellow of the American Physical Society, a Fulbright Fellow, a member of the Materials Research Society, the American Chemical Society and the American Society for Engineering Education and is an elected member of JEMS-EMA (The European Magnetism Association).