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## **Superconducting Magnets: An Enabling Technology for Physics Research and Society**

*Thursday 11 February 2021 16:15 (1 hour)*

Fundamental science has nurtured superconducting magnet technology for a long time in order to explore the high energy regime. The discovery of the long-awaited Higgs boson at CERN's Large Hadron Collider, based on thousands of powerful superconducting magnets, is maybe the most famous outcome. However, technologies that are only possible due to the invention of large superconducting magnets, such as magnetic resonance imaging (MRI) scanners, have made important impacts on our lives. The quest for even higher magnetic fields, necessary for the next generation energy frontier colliders, is generating a vigorous effort toward the 20 tesla dipole field frontier (doubling the LHC range). New materials are being engineered, like rare earth and iron-based superconductors to build the magnets from. In addition new paradigms for coil technology are being tested, for example, conductor windings with no electrical insulation. In the meanwhile, magnet designers are exploring new magnet topology to take advantage of new superconductors and new technologies. The talk will illustrate the recent achievement in this domain and discuss the possible reverberation on society.

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