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Current Leads and superconducting transmission

Wednesday 4 June 2025 17:40 (1 hour)

About the lecture:

Electrical transfer from a room temperature power source to a superconducting system can be done via conventional or superconducting current leads and superconducting buses or links. The principles of optimization of these devices are presented, with emphasis on the cryogenic, electrical, and superconductor related aspects that drive choices for a system.

About the speaker:

Senior scientist at CERN, the European Organization for Nuclear Research, Amalia Ballarino was responsible for the several thousand current leads that today power the superconducting magnets of the Large Hadron Collider (LHC). For the development of High Temperature Superconducting (HTS) current leads, which has been the first large-scale commercial application of HTS materials, she received the award of "Superconductor Industry Person of the Year 2006". After having participated in the commissioning of the Large Hadron Collider, she proposed and worked on the development of novel superconducting electrical transmission systems, based on MgB2 technology, which are today part of the HL-LHC upgrade. Her field of expertise covers low temperature (Nb-Ti, Nb3Sn and MgB2) and high-temperature (BSCCO and REBCO) superconducting materials and systems. In 2021, she received the "IEEE Dr. James Wong Award"for Continuing and Significant Contributions to Applied Superconductor Materials Technology (IEEE Dr. James Wong Award for Continuing and Significant Contributions to Applied Superconductor Materials Technology | IEEE Council on Superconductivity (ieeecsc.org)). She serves the community as lecturer, supervisor of PhD students, co-chair and organizer of international workshops, member of international committees (2023 Particle Physics Project Prioritization Panel (P5), Technical Advisory Committee (TAC) of the USA Magnet Development Program, Electron Ion Collider Magnet Steering Group, IEC/TC90 committee), member of program committees of international conferences, and technical editor and reviewer of papers for scientific journals.

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