## TIDM<sup>2</sup> x SC Magnets Lecture Series 2025



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## Cryostat design

Thursday 19 June 2025 16:30 (1 hour)

About the lecture:

This lecture introduces the design of helium cryostats for accelerator applications focused on CERN applications. Main functions of cryostats are described, pointing out differences between accelerator cryostats and test cryostats. The properties of helium are explained, underlining the advantages for SC devices operation points. The refrigeration power needs (Carnot and real machines) and the need for thermal efficiency of cryostats are underlined. Heat transfer mechanisms and simple calculation formulas are introduced. Thermal design solutions are covered for radiation protection (thermal shielding with MLI) and optimal heat conduction interception along feedthroughs. Materials and mechanical design considerations are mentioned.

About the speaker

Vittorio Parma is a senior applied physicist at CERN, which he joined in 1995 to work at the design and construction of the superconducting accelerator magnets of the Large Hadron Collider (LHC).

He is presently a member of the radio-frequency group (SY-RF) where he leads the development of the SRF cryomodule systems for the Future Circular Collider (FCC).

Vittorio hold a master's degree in aerospace engineering from Politecnico di Milano (Italy). Before joining CERN, he worked at the European Space Agency (ESA-ESTEC) in The Netherlands.

For over 15 years Vittorio has led the Section of Cryostats for Superconducting Magnets. As an expert in the domain of accelerators and cryogenic engineering, he regularly sits in technical and managerial review panels for large international projects (ITER, ILC, CPEC amongst others). He is also active in trainings and outreach activities at and outside CERN.

Presenter: PARMA, Vittorio (CERN)