

Workshop on Frontiers in Quantum Materials



September 1 – 5, 2025

ICTP-SAIFR, São Paulo, Brazil

Venue: Principia Institute

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Password: quantum

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The search for novel emergent phases of matter has played a pivotal role in Condensed Matter Physics in the past few decades. In these phases, strong correlations, disorder and non-trivial topology of the electronic wave functions lead to quantum effects that leave fingerprints in a wide range of length and energy scales. Examples include high- T_c superconductors, topological insulators and semimetals that host robust surface states, and fractionalized excitations in quantum spin liquids. The capability of characterizing these exotic phases of matter at a fundamental level, predicting their occurrence in various materials, and taking advantage of on-demand manipulation of their properties for technological applications is attracting increasing interest in the broad and rich field of Quantum Materials. Among the open questions in the field, the correlation-driven topological states and the role of the quantum geometry of the wave functions beyond the Berry curvature in macroscopic properties of matter remain topics of intense debate. The ICTP-SAIFR Workshop on Frontiers in Quantum Materials brings together experts to discuss the most recent theoretical and experimental developments in the field of Quantum Materials. The exchange of ideas stimulated by the workshop will be a fertile ground for new collaborations between the participants.

We are happy to announce that poster prizes will be awarded during the event, recognizing the best contributions presented in the poster session. These prizes are sponsored by EPL (Europhysics Letters) and we encourage all participants to present posters that showcase their work. Learn more about EPL at <https://www.eplletters.net/>.

There is no registration fee and limited funds are available for local expenses.

Organizers:

- **Eric Andrade** (USP, Brazil)
- **Rui Aquino** (ICTP-SAIFR e IFT-UNESP, Brazil)
- **Daniel Barci** (UERJ, Brazil)
- **Rafael Fernandes** (University of Illinois Urbana-Champaign, USA)
- **Eduardo Miranda** (UNICAMP, Brazil)
- **Thais Victa Trevisan** (IFSC-USP, Brazil)