

SMS Spring 2023 Seminar Series

Friday Feb 24 | 3pm | Biodesign Auditorium

The Quest for New Matter

The past decade has seen a huge surge of interest in matter that cannot be described by our standard theories such as Landau-Ginzburg theory or the Standard Model. For example, the theoretical proposal and subsequent experimental realization of topological phases in materials has ushered in a new era in the discovery of new forms of matter. On top of this, how these new phases of matter interact with our conventional order parameters such as superconducting, ferroelectricity, and magnetism, is an emerging area. In this talk, I will discuss how theory and ab initio calculations have driven the discovery of such novel forms of matter, with applications in classical and quantum computing. Finally, I will discuss how such emergent phenomena in quantum materials are apt for exploring matter that cannot be described by the Standard Model – dark matter – and how materials-by-design approaches can suggest new and enhanced detection experiments for low-mass dark matter detection.

Sinéad Griffin, PhD

Staff Scientist, Lawrence Berkeley National Laboratory

Sinéad Griffin is a staff scientist in the Materials Science Division and the Molecular Foundry at Berkeley Lab. Originally from Ireland, her work as a theorist focuses on the description and discovery of quantum materials and physical phenomena at the nanoscale. The applications of Sinéad's work range from new materials for energy and quantum computing to exploring the origins of the universe. Her awards include the Swiss Physical Society's General Prize, the Berkeley Lab Director's Award for outstanding scientific achievement, an MIT Rising Star in Physics, the Falling Walls Bay Area Young Innovator of the Year, and an 'Emerging Leader' from the Institute of Physics. Aside from her research, she is involved with building a research network in condensed matter physics in Africa, including being awarded an inaugural American Physical Society Innovation Fund grant to set up a US-Africa Workshop and Network.

