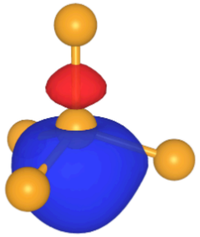
Electronic structure and topology of novel materials

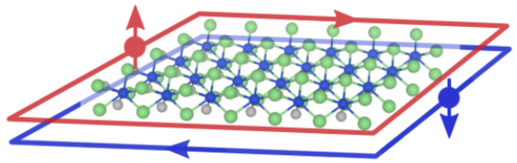
Theory and first-principles simulations of materials, with a focus on
topological insulators, **two-dimensional materials** and **electronic-structure theory**



Electronic-Structure Theory & Algorithms

Advances in electronic-structure theory and development of innovative algorithms

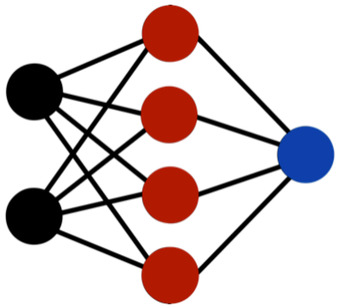
- Develop and implement **new theories** to compute geometrical and topological quantities for disordered and finite-temperature systems
- Develop **computational methods and algorithms**



Topological & Quantum Materials

Design and discovery of novel 2D materials, topological insulators and other quantum materials

- **First-principles simulations** (DFT & many-body perturbation theory) of novel **2D materials** and van-der-Waals heterostructures
- Study of **topological insulators** and **superconductors** (**Majorana fermions**)



Machine Learning

Data mining and machine learning techniques applied to electronic structure simulations

- Develop **machine-learning methods** to accelerate electronic structure simulations

*Physics driven by **spin-orbit** coupling, **low dimensionality** and **topology***

Contacts and more info at https:www.units.it/marrazzo