

Curriculum Vitae: Federico Mazzola – University of Padova; federico.mazzola@unipd.it · +39 3518940653 · ORCID 0000-0002-5380-4374 Date of birth 15/10/1988 · Italian

2025– Associate Professor, University of Padova, Physics Department (current)  
2024–2025 Senior Researcher (CNR)  
2022–2024 Researcher, Ca' Foscari University Venice  
2020–2022 Postdoctoral Researcher, IOM-CNR Trieste  
2016–2020 Postdoctoral Researcher, University of St Andrews  
2013–2016 PhD Physics, NTNU Trondheim (and short postdoc)  
2011–2012 MSc Physics, La Sapienza Rome (visiting fellow ASTRID, Aarhus)  
2007–2010 BSc Physics, La Sapienza Rome

Experimental condensed-matter physicist working on quantum materials, electronic structure, Berry curvature phenomena, spin–orbit interactions, and unconventional magnetic phases. Expertise in ARPES, spin-resolved photoemission, ultrahigh-vacuum instrumentation, synchrotron radiation, and home-lab spectroscopy. Additional experience with STM/STS, XRD, Raman, optical spectroscopy, and DFT/tight-binding modelling. Author of more than 75 publications, including several in *Nature*, *Nature Physics*, *Nature Materials*, *PRL* and *PNAS*. Guest editor for *npj Quantum Materials* (2025). Evaluator for BESSY-II and frequent referee for major journals.

#### Funding

2025 Fis2 Consolidator grant (FIS-2, ERC PE3), 1.65 M€ (MATILD)  
2024 Chair Metropole Rennes (376 k€, declined for time commitment)  
2023– NFFA First Researcher grant (CNR level-2)  
2016–2024 More than 30 awarded synchrotron proposals (~150 days)  
2020–2022 IOM-CNR Individual Fellowship  
2016–2020 St Andrews Postdoctoral Fellowship  
Early career Norwegian grants (machine-development, travel support)

1. *Nature Communications* 16, 4495 (2025)  
Bilayer orthogonal ferromagnetism in CrTe<sub>2</sub>-based van der Waals system
2. *Physical Review Letters* 134, 066501 (2025)  
Strain-induced enhancement of the charge-density-wave in the kagome metal ScV<sub>6</sub>Sn<sub>6</sub>
3. *Nature* 626, 752–758 (2024)  
Signatures of a surface spin–orbital chiral metal
4. *Nature Physics* 21, 110–117 (2024)  
Measurements of the quantum geometric tensor in solids
5. *Nature Physics* 20, 1103–1109 (2024)  
Spin–Berry curvature enhanced orbital Zeeman effect in a kagome metal
6. *Nature Communications* 15, 3720 (2024)  
Weyl spin–momentum locking in a chiral topological semimetal
7. *Nature Physics* 19, 1135–1142 (2023)  
Flat band separation and resilient spin–Berry curvature in bilayer kagome metals

In the proposed project, Mazzola will work with Edmonds to perform angle-resolved photoelectron spectroscopy to determine the spin-resolved band structure of the kagome materials studied. He will measure how the electronic states evolve with thickness, strain and applied electric fields, and will identify signatures of topological band features, flat bands and magnetic exchange splitting. By mapping both bulk and surface electronic structure, he will provide insight into the quantum geometry and topological transport responses observed by Karel. His measurements will be supported by theoretical modelling conducted by Yan and will validate the nanoscale electronic studies performed by Edmonds.