CV of JONATHAN FRASSINETI

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CURRENT POSITION:

PhD student in Physics at the Department of Physics and Astronomy of the University of Bologna, Italy, since November 2020.

My main project regards the study of quantum materials by using magnetic resonance techniques, such as Nuclear Magnetic Resonance (NMR) and Muon Spin Spectroscopy (μSR).

EDUCATION:

- 23/10/2020: Master's Degree in Physics, 110/110, Department of Physics and Astronomy, University of Bologna, Italy.
- 19/10/2018: Bachelor's Degree in Physics, 106/110, Department of Physics and Astronomy, University of Bologna, Italy.

INTERNATIONAL EXPERIENCES:

- September 2021-January 2022/September 2022-December 2022: Visiting Research Fellow at Brown University, USA, as a part of my PhD project about the physical characterization of quantum materials using NMR.
- February-March 2020: Erasmus+ exchange program at the University of Cordoba, Spain, for a traineeship in Multiferroic materials.

SCIENTIFIC ACTIVITY:

My main research interest regards the experimental study of Quantum Materials Physics in novel class of materials (such as Kitaev antiferromagnetic materials and 2D Kagome superconductors), where electronic orderings and exotic excitations induce new phases of matter, as quantum spin liquids (QSL), charge-density wave (CDW) and topological insulators.

My main expertise is on magnetic resonances (NMR/NQR) and muon spin spectroscopy (μSR) techniques. In addition, direct experience with basic characterization by electric conductivity and X-ray Diffraction.

Good knowledge of programming language (Python 3), data analysis software (Matlab) and data acquisition hardware.

EXPERIMENTS AT LARGE SCALE FACILITIES:

- 18/09/2023-25/09/2023: μSR experiment on the superconducting and low-T state of CsV_3Sb_5 doped samples at ISIS Pulsed Muon and Neutron Source, Rutherford Appleton Laboratory, Harwell Oxford, Didcot, UK, under the supervision of Prof. Samuele Sanna, University of Bologna
- 29/06/2023-03/07/2023: μSR experiment on the superconducting state of CsV_3Sb_5 doped samples at Paul Scherrer Institut, Villigen, Switzerland, under the supervision of Prof. Samuele Sanna, University of Bologna
- 20/06/2023-29/06/2023: High-field NMR experiment on the low-temperature phase of RbV_3Sb_5 at the Laboratoire National des Champs Magnétiques Intenses (LNCMI-CNRS), Grenoble, France, under the supervision of Prof. Vesna Mitrovic, Brown University
- 16/08/2022-22/08/2022: μSR experiment on the study of low-temperature CDW state in CsV_3Sb_5 doped samples at Paul Scherrer Institut, Villigen, Switzerland, under the supervision of Prof. Samuele Sanna, University of Bologna
- 19/04/2022-25/04/2022: Resonant Inelastic X-ray Scattering (RIXS) experiment on the study of low-temperature excitations in calcium-doped double perovskite $Ba_2Na_{1-x}Ca_xOsO_6$ samples at the European Synchrotron Radiation Facility (ESRF), Grenoble, France, under the supervision of Prof. Marco Moretti, Politecnico di Milano.
- 09/09/2021-13/09/2021: μSR experiment on the study of quantum entanglement in A15 superconductors at Paul Scherrer Institut, Villigen, Switzerland, under the supervision of Prof. Samuele Sanna, University of Bologna.

CONTRIBUTED ORAL PRESENTATIONS:

- 13/04/2023: contributed talk at the MANO Spring Coffee Talks 2023 organized by the Department of Physics and Astronomy at University of Bologna, Italy.
- 29/08/2022: contributed talk at muSR2020, the 15th International Conference on Muon Spin Rotation, Relaxation and Resonance, held in Parma, Italy
- 13/04/2021: contributed talk at the MANO Spring Coffee Talks 2021 organized by the Department of Physics and Astronomy at University of Bologna, Italy.

CONTRIBUTED POSTERS:

- 11-13/04/2022: participation with poster at the VIII Italian Conference on Magnetism Magnet2022 in Firenze, Italy.
- 14-18/03/2022: participation with oral contribution at the APS March Meeting 2021 organized by the American Physical Society (APS) in Chicago, USA, held on-line.
- 13-17/09/2021**:** participation with poster at the 107° Congresso Nazionale della Società Italiana di Fisica, held on-line.

- 15-20/04/2021: participation with poster at the Korrelationstage 2021 organized by the Max Planck Institute, held on-line.

- 15-19/03/2021: participation with poster at the APS March Meeting 2021 organized by the American Physical Society (APS) in Chicago, USA, held on-line.

- 11-12/02/2021: participation with poster at the VII Italian Conference on Magnetism Magnet2021 in Firenze, Italy, held on-line.

EDUCATIONAL ACIVITIES:

- 14-20/07/2022: Didactic tutor for the Summer School “Quantum Sensing, Information, Processing and Computing” held by the Department of Physics and Astronomy, University of Bologna, Italy, for a total of 12 hours.

Co-supervisor of one Bachelor’s Degree and one Master’s Degree thesis in Physics at University of Bologna, Italy.

LANGUAGES SPOKEN:

- Italian: native speaker.
- English: very good (IELTS C1).
- Spanish: discrete.

CERTIFICATIONS:

- IELTS C1: English language proficiency certificate from British Council, received in January 2020, valid until January 2022.

- PCEP: Certified Entry-Level Python programmer, certificate of proficiency in the Python programming language from Python Institute, received in February 2021 (https://verify.openedg.org/?id=MVnN.u9aT.i7mo).

Bologna, 17/09/23

PUBBLICATIONS

- *Microscopic nature of the charge-density wave in the kagome superconductor* RbV_3Sb_5, J. Frassineti, P. Bonfà, G. allodi, E. Garcia, R. Cong, B. R. Ortiz, S. D. Wilson, R. De Renzi, V. Mitrovic, S. Sanna, **Phys. Rev. Research** 5 (2022) L012017

- *Entanglement between a muon spin and I > 1/2 nuclear spins,* P. Bonfà, J. Frassineti, J. M. Wilkinson, G. Prando, M. M. Isah, C. Wang, T. Spina, B. Joseph, V. Mitrović, R. De Renzi, S. J. Blundell, S. Sanna, **Phys. Rev. Lett.** 129 (2022) 097205

- *Fermi level tuning and double-dome superconductivity in the kagome metal* $CsV_3Sb_{5-x}Sn_x$, Y. M. Oey, B. R. Ortiz, F. Kaboudvand, J. Frassineti, E. Garcia, R. Cong, S. Sanna, V. F. Mitrović, R. Seshadri, S. D. Wilson, **Phys. Rev. Materials** 6 (2022) L041801

- *UNDI: An open-source library to simulate muon-nuclear interactions in solids,* P. Bonfà, J. Frassineti, M. M. Isah, I. J. Onuorah, S. Sanna, **Comp. Phys. Comm.** 260 (2021) 107719

Visit also:

- https://scholar.google.it/citations?hl=it&view_op=list_works&gmla=AJsN-F7sm1KWKAnOkcKgNVxRELvezimeAqipK0VY0mabA0KmAEggVYceP3vCgMbzcjQ97rrPGIc1V_lbqJWa_f0VwlMB6uuMpUc6pdbTKR9LnrKhxYTiwDY&user=G20Qd5MAAAAJ
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- https://www.unibo.it/sitoweb/jonathan.frassineti2/