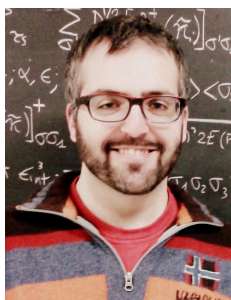


Marco Zanatta



Associate professor in Experimental Physics of Matter (02/B1; FIS/03)

Department of Physics

University of Trento

✉ via Sommarive 14, 38123, Trento, Italy.

☎ +39 0461 281522

@ marco.zanatta@unitn.it

ORCID: 0000-0003-3297-1998

ResearcherID: T-2562-2017

SCOPUS: 26538268400

Personal information

Date of Birth: 20/10/1983

Place of Birth: Bussolengo (VR)

Nationality: Italian

Work experiences

2019 - 2022 Assistant professor (*RTDb*) in Experimental Physics of Matter (02/B1; FIS/03), Department of Physics, University of Trento.

2016 - 2019 Postdoc researcher (*RTDa*) in Experimental Physics (02/B1; FIS/01), Department of Computer Science, University of Verona.

2015 - 2016 Postdoc researcher (*RTDa*) in Experimental Physics of Matter (02/B1; FIS/01), Department of Physics and Geology, University of Perugia.

2012 - 2015 Post Doc fellow (*Assegnista di ricerca*), Department of Physics and Geology, University of Perugia.

Education

2011 PhD in Physics, University of Trento, Italy.

2008 Master's degree in Physics, University of Trento, Italy.
Final Mark: 110/110 with honor.

2006 Bachelor's degree in Physics, University of Trento, Italy.
Final Mark: 110/110 with honor.

Qualifications

- *Abilitazione scientifica nazionale a professore II fascia* (SSC: 02/B1);
Italian scientific qualification as associate professor in Experimental Physics of Matter.
- *Abilitazione scientifica nazionale a professore II fascia* (SSC: 02/D1; SSD: FIS/07);
Italian scientific qualification as associate professor in Applied Physics.
- *Qualification Maître de Conference - Section 28, milieux denses et matériaux*;
Qualification as *Maître de Conference* in the Section 28, Dense media and materials.

Research activity

My research activity is devoted to the experimental study of disordered systems, in particular the structure and dynamics of glasses, colloids and biological systems. My research interests include:

- vibrational dynamics in glasses, colloids and biological systems;
- atomic dynamics in colloidal suspensions of microgels and biological systems;
- glass transition and relaxations in glasses;
- structure of disordered systems at different length scales;
- crystallization in supercooled liquids and glasses.

I have experience in several experimental techniques such as Raman and Brillouin spectroscopy, x-ray and neutron diffraction, inelastic neutron and x-ray scattering, and positron lifetime annihilation spectroscopy.

I have a strong interest in the development of new instrumentation and techniques. I have been involved in designing new neutron spectrometers for the forthcoming European Spallation Source (ESS). Moreover, within the Horizon 2020 “SOLSA” project, I have contributed to the development of a geo-exploration probe that combines x-ray diffraction, x-ray fluorescence and Raman spectroscopy. I have gained relevant competencies in designing, prototyping and testing new components as well as in ray-tracing simulations.

Recently, my interests have extended towards archaeometry and to the characterization of archaeological specimens with light and X-ray-based techniques.

Experiments carried out at international Large Scale Facilities

I have performed several experiments at European Large Scale Facilities for neutron scattering, synchrotron radiation and free-electron lasers. Since 2009, I have been granted 110 days of beamtime upon peer review of proposals presented as main-proposer. Further beamtime has been granted as a co-proposer.

Projects

from 2022	SOLSA dem-up (EIT Raw Materials).
2016 - 2021	SOLSA (H2020) an on-site on-mine geo-exploration expert system.
2016	T-REX, a thermal spectrometer for the European Spallation Source (ESS, Lund).
2012 - 2016	Tempus Fugit, a time-of-flight spectrometer for the European Spallation Source (Lund).

Teaching activity

Undergraduate courses

from 2023	Dating methods in Archaeology Interuniversity Master’s degree in Quaternary, Prehistory and Archaeology University of Ferrara
from 2023	Physics of Disordered Systems Master’s degree in Physics, University of Trento.

- since 2020 Applied physics in Cultural Heritage (coordinator)
Bachelor's Degree in cultural Heritage, University of Trento
- since 2019 Laboratory of Condensed Matter (coordinator)
Master's degree in Physics, University of Trento.
- 2020 - 2021 General Physics (in 2021 coordinator)
Bachelor's degree in Viticulture and Oenology, University of Trento.
- 2017 - 2019 General Physics
Bachelor's degree in Bioinformatics, University of Verona.
- 2016 Computational Methods for physics
Bachelor's degree in Physics, University of Perugia,

I served as teaching assistant in several general physics courses either at the university of Verona (Bachelor's degree in applied mathematics) and in Perugia (Bachelor's degree in Civil engineering).

Graduate courses

- 2018 - 2019 Applied physics in Occupational Medicine
Specialisation School in Occupational Medicine, University of Verona.
- 2019 An introduction to neutron scattering techniques in Condensed Matter
PhD School in Physics, University of Trento.
- 2017 A brief introduction to neutron scattering in Condensed Matter
PhD School in Nanoscience and Advanced Technologies, University of Verona.

Supervision of students

I am supervisor/co-supervisor of 2 PhD students in Physics and of 1 PhD student in Archaeology.

I was supervisor of 2 Master's students and co-supervisor of 3 Bachelor's students.

Thematic schools

I have given several lectures and tutorials at introductory and advanced Summer Schools in neutron scattering. From 2017 to 2019, I was director of the **Giornate Didattiche SISN**, an introductory school on neutron scattering organized yearly by the Italian Neutron Spectroscopy Society (SISN). In 2022, I was part of the organizing committee.

From 2022, I am part of the organizing committee of **AMARCH, Analisi dei Materiali per l'ARCHelogia e i beni culturali**. The school is organized yearly at the University of Trento and presents the use of analytic methods in archaeology or cultural heritage.

Organization of scientific meetings

From 2012, I have organized 4 editions of the International Workshop on Complex Systems. The next workshop will be in March 2023 in Andalo, Italy.

From 2014 to 2019 I organized 5 Annual Conferences of the Italian Neutron Scattering Society.

Commissions of trust

2021 - present Council of the PhD School in Physics of the University of Trento.

2017 - present Advisory Board of the Raman Open Database (ROD) project.

2014 - 2019 Executive board of the Italian neutron scattering society.

Memberships of scientific societies

2007 - present Member of the Italian Neutron Spectroscopy Society

Società Italiana di Spettroscopia Neutronica (SISN).

Presentations

- *Glasses, supercooled liquids and stability: Probing crystallization kinetics with neutrons.* XXXIII Congresso Annuale SISN, Milano (Italy) - September 2022
- *La caratterizzazione e lo studio della Pietra Ollare tramite indagine XRF e Raman: Approcci e primi risultati.* Commercio e paesaggio delle Alpi nel Medioevo. Il caso di Piuro. Piuro - June 2022
- *Evidence of a low temperature dynamical transition in concentrated PNIPAM microgels* XV International workshop on complex systems, Andalo (Italy) – March 2019
- *Piuro e la Pietra Ollare: Archeometria cave e ricerche sulle aree di estrazione.* La Val Bregaglia tra Alpi e Pianura Padana: Piuro, Paesaggi, Medioevo e Pietra Ollare, Piuro (Italy) - June 2018.
- *Ray-tracing simulations for a high-flux upgrade of the BRISP spectrometer,* 2nd International Workshop on Brillouin Scattering, Rome (Italy) – February 2016.
- *Vibrational dynamics in disordered systems: What can we learn by studying v -SiSe₂?* Invited oral presentation, XXIII Congresso Annuale SISN, Sesto Fiorentino (Italy) – June 2012.
- *High frequency dynamics in glassy SiSe₂* IV User Meeting at the FRMII, Garching (Germany) – March 2012
- *Mapping voids in permanently densified silica using positrons* SOFT Matter Workshop 2011, Parma (Italy) – February 2011.
- *Elastic properties and the boson peak in densified silica glasses.* Keynote lecture, 8th Symposium SiO₂ 2010, Varenna (Italy) – June 2010.

Moreover, I presented 12 posters at national and international conferences and workshops.

Publications

I have published 39 scientific papers including 1 in Nature Communications, 1 Science Advances, 1 in Proceedings of the National Academy of Science USA, 4 in Physical Review Letters, and 3 in Journal of Physical Chemistry Letters. 6 papers were selected as research highlights in the annual reports of large-scale facilities. I also published a chapter in an edited book.

I have a total H-index of 16 and 653 citations (source: Scopus, 6/11/2022).

A few representative publications

1. M. Cassetta, D. Di Genova, M. Zanatta, T. Boffa-Ballaran, A. Kurnosov, M. Giarola, and G. Mariotto, *Estimating the viscosity of volcanic melts from the vibrational properties of their parental glasses*, Sci. Rep. **11**, 1-14 (2021).
2. L. Tavagnacco, M. Zanatta, E. Buratti, B. Rosi, B. Frick, F. Natali, J. Ollivier, E. Chiessi, M. Bertoldo, E. Zaccarelli, A. Orecchini, *Protein-like dynamical transition of hydrated polymer chains*, Phys. Rev. Research **3**, 013191 (2021).
3. M. Zanatta, K.H. Andersen, P.P. Deen, A. Orecchini, A. Paciaroni, C. Petrillo, and F. Sacchetti, *Disentangling time-focusing from beam divergence: A novel approach for high-flux thermal neutron spectroscopy at continuous and long-pulse sources*, Rev. Sci. Instrum. **90**, 095101 (2019).
4. M. Zanatta, L. Tavagnacco, E. Buratti, M. Bertoldo, F. Natali, E. Chiessi, A. Orecchini, and E. Zaccarelli, *Evidence of a low temperature dynamical transition in concentrated PNIPAM microgels*, Sci. Adv. **4**, eaat5895 (2018).
5. M. Zanatta, F. Barocchi, A. De Francesco, E. Farhi, F. Formisano, E. Guarini, A. Laloni, A. Orecchini, A. Paciaroni, C. Petrillo, W-C. Pilgrim, J-B. Suck, F. Sacchetti, *A high-flux upgrade for the BRISP spectrometer at ILL*, Rev. Sci. Instrum. **88**, 053905 (2017).
6. M. Zanatta, F. Sacchetti, E. Guarini, A. Orecchini, A. Paciaroni, L. Sani, and C. Petrillo, *Collective Ion Dynamics in Liquid Zinc: Evidence for Complex Dynamics in a Non-Free-Electron Liquid Metal*, Phys. Rev. Lett. **114**, 187801 (2015).
7. B. Ruta, G. Baldi, Y. Chushkin, B. Rufflé, L. Cristofolini, A. Fontana, M. Zanatta, F. Nazzani, *Revealing the fast atomic motion of network glasses*, Nat. Commun. **5**, 3939 (2014).
8. M. Zanatta, G. Baldi, R.S. Brusa, W. Egger, A. Fontana, E. Gilioli, S. Mariazzi, G. Monaco, L. Ravelli and F. Sacchetti, *Structural evolution and medium range order in permanently densified vitreous SiO₂*, Phys. Rev. Lett. **112**, 045501 (2014).
9. M. Zanatta, A. Fontana, A. Orecchini, C. Petrillo, and F. Sacchetti; *Inelastic neutron scattering investigation in glassy SiSe₂: Complex dynamics at the atomic scale*; J. Phys. Chem. Lett. **4**, 1143–1147 (2013).
10. M. Zanatta, G. Baldi, S. Caponi, A. Fontana, E. Gilioli, M. Krish, C. Masciovecchio, G. Monaco, L. Orsingher, F. Rossi, G. Ruocco, and R. Verbeni, *Elastic properties of permanently densified silica: a Raman, Brillouin light, and x-ray scattering study*, Phys. Rev. B **81**, 212201 (2010).

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Trento, 06/11/2022