



Federico Caporaletti

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- Date of birth 27/04/1992 - Nationality Italian

14/04/2020-present

Post-doctoral researcher

Van der Waals-Zeeman Institute, Institute of Physics/Van 't Hoff Institute for Molecular Sciences, University of Amsterdam, Amsterdam, The Netherlands

My research activity aims to characterize liquid-liquid transitions and the glass-transition properties in supercooled H-bonded liquids using femtosecond IR-spectroscopy and X-ray scattering.

01/04/2017-01/04/2018

Visiting Scientist

European Synchrotron Radiation Facility (ESRF) in Grenoble.

Scientific collaboration with Dr. Aleksandr Chumakov of the beamline ID18 (MEX group, Experimental Division) of the European Synchrotron Radiation Facility on the subject: "atomic dynamics in liquids and glasses."

21/03/2016-20/07/2016

Trainee

European Synchrotron Radiation Facility, Grenoble (France)

Title of project: 'Development of nuclear quasi-elastic scattering with high energy transfer'

Duration of the stage: 720 hours

The traineeship was co-funded by the ESRF and the European Union in the framework of the **ERASMUS+** program

EDUCATION

1/11/2016-25/05/2020

Ph.D. student

Department of Physics, Università degli Studi di Trento, Italy

Supervisor: Prof. Giulio Monaco.

Thesis Title:

"Atomic dynamics in glass-forming liquids during the Johari-Goldstein relaxation"

My Ph.D. was focused on the study of **slow** and **fast** dynamics in undercooled liquids and glasses.

To tackle these rather complex and broad topics I have been using several experimental techniques involving both visible (Raman, Brillouin Scattering, Dynamical Light scattering) and X-rays/EUV radiation (TDI, XPCS, TG)

2014-2016

Master's degree in Physics

Departments of Physics, Università degli Studi di Trento, Italy.

Final degree mark: 110/110 cum laude.

Supervisor: Prof. Giulio Monaco. Co-supervisor: Dr. Aleksandr Chumakov

Thesis title: **"Relaxation in supercooled liquids: a nuclear γ -resonance time-domain interferometry study"**.

2011-2014

Bachelor's degree in physics

Departments of Physics, Università degli Studi di Trento, Italy

Final degree mark: 110/110

Supervisor: Prof. Giulio Monaco. Co-supervisor:

Thesis title: **"Experimental set-up for photon correlation spectroscopy of glass-formers in the glass transition region"**.

Attended Conferences and Workshops:

- **103 Conferenza della Società Italiana di Fisica**, Trento, 11/09/2017-17/09/2017
Oral presentation title: “*Relaxations in supercooled liquids probed by nuclear gamma-resonance time-domain interferometry*”
- **Workshop “Photonics as a key enabling technology”**, Trento, 17/11/2017
Poster title: “*Nuclear gamma-resonance time-domain interferometry as probe of slow dynamics in condensed matter*”.
- **The 10th Broadband Dielectric Spectroscopy Society (BDS) Conference**
Bruxelles, 26/08/18-31/08/2018
Oral presentation title: “*Nuclear resonant scattering as microscopic probe for the Johari-Goldstein relaxation in supercooled liquids*”.
- **EBS-Workshop on Nuclear Resonance Scattering**. Grenoble, 11/03/19-12/09/2019
Poster title: “*Micro-eV Vibrational Dynamics in amorphous SiO₂*”
- **XV International Workshop on Complex Systems** Andalo, 17/03/19-20/03/2019
Oral presentation title: “*A microscopic look at the Johari-Goldstein relaxation in a hydrogen-bonded liquid*”. Poster Title: “*Micro-eV Vibrational Dynamics in amorphous SiO₂*”
- **The 17th international conference on liquid and amorphous metals**
Lyon 26/08/19-30/08/19. Oral presentation title: “*A microscopic look at the Johari-Goldstein relaxation in a hydrogen-bonded liquid*”
- **Expert Workshop on Nuclear Resonant Scattering of Synchrotron Radiation (online event)**
12/01/21-15/01/21. Oral presentation title: “*New ideas in time-domain interferometry*”

Organised conferences:

Member of the organizing committee of the **XV International Workshop on Complex Systems** held in Andalo (17/03/19-20/03/2019)

Publications:

1. **F. Caporaletti**, A. I. Chumakov, R. Ruffer and G. Monaco,
“*A new experimental set-up for nuclear γ -resonance time-domain interferometry*”
Review of Scientific Instruments **88**, 105114 (2017);
2. **F. Caporaletti**, S. Capaccioli, S. Valenti, M. Mikolasek, A. I. Chumakov, G. Monaco
“*A microscopic look at the Johari-Goldstein relaxation in a hydrogen-bonded glass-former.*” **Scientific Reports** **9(1)**, 14319 (2019).
3. **F. Caporaletti**, A. I. Chumakov, R. Ruffer and G. Monaco,
“*Accessing the non-ergodicity factor of o-terphenyl via multi-line nuclear γ -resonance time-domain interferometry*” **Philosophical Magazine**, 1-12 (2020);
4. **F. Caporaletti**, S. Capaccioli, S. Valenti, M. Mikolasek, A. I. Chumakov, G. Monaco.
“*Experimental evidence of a mosaic structure in supercooled liquids*”. **Nat. Commun.** **12**, 1867 (2021).
5. F. Bencivenga, R. Mincigrucci, F. Capotondi, L. Foglia et al., **F. Caporaletti**, et al.,
G. Monaco, K. A. Nelson and C. Masciovecchio. “*Nanoscale transient gratings excited and probed by extreme ultraviolet femtosecond pulses*”. **Science Advances**, **5**: eaaw5805 (2019)
6. F. Dallari, A. Martinelli, **F. Caporaletti**, M. Sprung, G. Grübel, G. Monaco,
“*Microscopic pathways for stress relaxation in repulsive colloidal glasses*”, **Science Advances** **12(6)**: eaaz2982 (2020).

Scientific proposals and large-scale facility experiments:

- Main proposer and principal investigator of 5 proposals at the ESRF (Grenoble), 1 proposal at Petra III (Hamburg) and, 1 proposal at the European XFEL (Hamburg).