



FRANCESCO BRUNO

PERSONAL INFORMATION

Date of Birth 16 January 1998
Gender Male
Nationality Italian
Email bruno@cerm.unifi.it
G. Scholar https://scholar.google.com/citations?user=zeFe_0IAAAAJ&hl=it
Personal Website <https://metallertm.github.io>

RESEARCH INTERESTS

Solution and solid-state NMR spectroscopy of materials and biomolecules, data processing and analysis

WORK EXPERIENCE

Jan – Jul 2026

Research scholarship

Magnetic Resonance Center (CERM) and Department of Chemistry "Ugo Schiff", University of Florence, Italy

SUPERVISOR: Prof. Enrico Ravera

PROJECT TITLE: Development of software for the analysis of temporal series of NMR spectra in the formation of inorganic oxides

Jan – Nov 2025

NMR Technician

Magnetic Resonance Center (CERM), University of Florence, Italy

MAIN OCCUPATIONS: Setup and maintenance of solution and solid-state NMR spectrometers, data acquisition, processing and analysis, research support

EDUCATION

2022–2024

Ph.D. in International Doctorate in Structural Biology – *class CHEM-03/A*

Magnetic Resonance Center (CERM), University of Florence, Italy

THESIS: Automatized Quantitative NMR for Industrial Applications

SUPERVISOR: Prof. Enrico Ravera

2019–2021

Master Degree in Advanced Molecular Sciences – *class LM-54*

University of Florence, Italy

THESIS: Structural characterization of bioinspired inorganic oxides

SUPERVISOR: Prof. Enrico Ravera

CO-SUPERVISOR: Prof. Ilaria Palchetti

2016–2019

Bachelor Degree in Chemistry – *class L-27*

University of Florence, Italy

THESIS: Innovative Denoising Methods Applied to Silica-Lysozyme Interaction Studies

SUPERVISOR: Prof. Enrico Ravera

CO-SUPERVISORS: Prof. Leonardo Tenori, Lucia Gigli

OTHER EXPERIENCES

May–Nov 2023 Six-months research secondment

Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany
SUPERVISORS: Dr. habil. Michael Maiwald, Dr. Klas Meyer
TRAINEESHIP TITLE: Development of Python-based tools for data evaluation of NMR spectral data of high- and low-field instruments

SCHOOLS AND CONFERENCES

9–11 June 2025 MaSAG25 Summer School and Conference
L'Aquila (AQ), Italy
CONTRIBUTE: full-length talk and poster presentation, invited

4–6 Sep 2024 51st National Conference on Magnetic Resonance
Florence (FI), Italy
CONTRIBUTE: poster presentation

6–10 Mar 2023 5th G-NMR School
Düsseldorf, Germany
CONTRIBUTE: participant

14 Oct 2022 GIDRM DAY – Data analysis and NMR: from fundamental aspects to health and materials applications, in memory of Stefano Caldarelli
Online
CONTRIBUTE: organizer

27–30 Sep 2022 Italian-French International Conference on Magnetic Resonance
Milan (MI), Italy
CONTRIBUTE: poster presentation

19–24 Jun 2022 Chianti Workshop: Opening New Doors for Magnetic Resonance
Principina Terra (GR), Italy
CONTRIBUTE: flash talk and poster presentation

STUDENTS

2025 Co-supervisor – Degree in Chemistry

University of Florence, Italy
STUDENT: Cristian Calabrò
THESIS TITLE: Structural Analysis and Chemical Composition of Nests of Various Vespidae Species using Solid-State NMR Spectroscopy
SUPERVISOR: Prof. Enrico Ravera
GRADUATION DATE: 10 December 2025

2025 Co-supervisor – Degree in Chemistry

University of Florence, Italy
STUDENT: Alessia Dhamo
THESIS TITLE: Characterization of Inorganic Oxide Heterogeneous Catalyst Containing Cytochrome-c
SUPERVISOR: Prof. Enrico Ravera
GRADUATION DATE: April 2026 (*expected*)

PUBLICATIONS

1. Letizia Fiorucci et al. “Applications of Fast Iterative Filtering in NMR Spectroscopy: Baseline Correction”. In: *Magnetic Resonance in Chemistry* 63.9 (2025), pp. 737–747
2. Letizia Fiorucci et al. “Extracting trends from NMR data with TrAGICo: A python toolbox”. In: *Magnetic Resonance in Chemistry* 63.8 (2025), pp. 628–654
3. Francesco Bruno et al. “pyIHM: Indirect Hard Modeling, in Python”. In: *Analytical Chemistry* 97.8 (2025), pp. 4598–4605
4. Jose Malanho da Silva et al. “The structure of His15 acetamide-modified hen egg-white lysozyme: a nice surprise from an old friend”. In: *Structural Biology and Crystallization Communications* 81.2 (2025)
5. Francesco Bruno, Letizia Fiorucci, and Enrico Ravera. “Sensitivity considerations on denoising series of spectra by singular value decomposition”. In: *Magnetic Resonance in Chemistry* 61.6 (2023), pp. 373–379
6. Francesco Bruno, Lucia Gigli, and Enrico Ravera. “Spin label study of the orientational preferences of lysozyme in a bioinspired silica composite”. In: *Journal of Composites Science* 7.5 (2023), p. 188
7. Andrea Brunetti et al. “Graphene-Oxide Mediated Chemodivergent Ring-Opening of Cyclobutanols”. In: *Chinese Journal of Chemistry* 41.11 (2023), pp. 1333–1340
8. Francesco Bruno et al. “Fast 2D NMR to Investigate Dynamic Events in Biomolecules”. In: *Fast 2D Solution-state NMR: Concepts and Applications* Chapter 10 (2023), pp. 284–310
9. Francesco Bruno et al. “Lysozyme is Sterically Trapped Within the Silica Cage in Bioinspired Silica–Lysozyme Composites: A Multi-Technique Understanding of Elusive Protein–Material Interactions”. In: *Langmuir* 38.26 (2022), pp. 8030–8037
10. Samantha Caputo et al. “Study and application of graphene oxide in the synthesis of 2, 3-disubstituted quinolines via a Povarov multicomponent reaction and subsequent oxidation”. In: *RSC advances* 12.25 (2022), pp. 15834–15847
11. Francesco Bruno et al. “Multivariate Curve Resolution for 2D solid-state NMR spectra”. In: *Analytical chemistry* 92.6 (2020), pp. 4451–4458

DEVELOPED SOFTWARES

<i>klassez</i>	Python software for processing and analysis of NMR data GITHUB: https://github.com/MetallerTM/klassez PYPI: https://pypi.org/project/klassez/
<i>pyIHM</i>	Software for quantitative analysis of mixtures through Indirect Hard Modelling of NMR spectra GITHUB: https://github.com/MetallerTM/pyihm PYPI: https://pypi.org/project/pyihm/
<i>T1-Ttune</i>	This software computes the optimal delays for protein dynamics experiments GITHUB: https://github.com/enricoravera/t1ttune PYPI: https://pypi.org/project/t1ttune/
<i>TrAGICo</i>	TRAGICO (TRENDS Analysis Guided Interfaces COLLECTION) is a collection of functions for the extraction and analysis of experimental parameters from 1D and pseudo-2D NMR spectra acquired on Bruker instruments, designed to streamline the process of identifying

trends in NMR data and facilitate various analytical tasks.

GIT HUB: <https://github.com/letiziafiorucci/tragico>

COMPUTER SKILLS

<i>Operative Systems</i>	Linux (<i>advanced</i>), Windows (<i>advanced</i>)
<i>Programming</i>	Python (<i>advanced</i>), Bruker pulse-sequences (<i>intermediate</i>), Bash (<i>intermediate</i>), C++ (<i>basic</i>)
<i>Others</i>	Latex (<i>advanced</i>), Adobe Illustrator (<i>intermediate</i>), GIMP (<i>intermediate</i>)

OTHER INFORMATION

<i>Languages</i>	<u>ITALIAN</u> · Mother tongue <u>ENGLISH</u> · Proficient
<i>Interests</i>	Traditional Japanese swordmanship (<i>Hokushin Ittō-ryū Hyōhō, introductory teacher</i>)

March 18, 2026

