

PERSONAL INFORMATION **Francesca Tonolo**

 Via dei Gatari, 11, 35128, Padova, Italy

 +39 3474603345  +39 0498020007

 francesca.tonolo@sns.it

 [ORCID ID 0000-0002-9555-7834](https://orcid.org/0000-0002-9555-7834) [Scopus Author ID 57219123843](https://scopus.com/authid/detail.url?authorID=57219123843)

Gender Female | **Date of birth** 31 August 1994 | **Nationality** Italian

JOB APPLIED FOR **Bando per contratti di tutorato per attività di laboratorio 2° ciclo ed estensivi (dip. CHIM) - academic year 2022-2023**

EDUCATION AND TRAINING

November 2019 – today **Attending PhD Course in Astrochemistry**

Thesis title: *Collisional excitation in space: from the interstellar medium to planetary atmospheres.*

Supervisor: Prof.ssa Cristina Puzzarini.

Internal Advisor: Prof. Vincenzo Barone

Scuola Normale Superiore - Pisa.

April 2022 – July 2022 **Three months off-site research at the IPR (Institut de Physique de Rennes)**

Outgoing research period at the group of Prof. François Lique, with the aim of delve into collisional research studies for molecules of astrochemical interest.

Université de Rennes 1, Rennes, France.

January 2020 – October 2023 **Research mobility in University of Bologna**

Mobility research period at the Rotational and Computational Spectroscopy group aimed at developing non-reactive scattering models fundamental to the characterization of astrochemical processes.

Supervisor: Prof.ssa Cristina Puzzarini.

Alma Mater Studiorum - Università di Bologna.

October 2017 – July 2019 **Master Degree in Chemistry - Curriculum B (Metodologie di Analisi e Caratterizzazione)**

Thesis: *Exploring reactivity and composition of the interstellar medium: the cases of formyl cyanide and methyl isothiocyanate.*

Supervisor: Prof.ssa Cristina Puzzarini.

Co-supervisors: Prof.ssa Paola Caselli, Dott. Valerio Lattanzi, Dott. Lorenzo Spada.

Final Grade: 110/110 *cum laude*.

Alma Mater Studiorum - Università di Bologna.

February 2019 – May 2019 **Trainee at the Max Planck Institute for Extraterrestrial Physics (Erasmus+ Project)**

Traineeship at the Center for Astrochemical Studies for Extraterrestrial Physics (Garching, Germany) titled *High-resolution molecular rotational spectroscopy on highly reactive species of astrochemical interest.*

Supervisor: Prof.ssa Paola Caselli.

October 2013 – April 2017 Bachelor Degree in Chemistry

Thesis: *Spettroscopia vibrorotazionale di molecole biatomiche.*

Supervisor: Prof.ssa Camilla Ferrante.

Final Grade: 106/110.

Università degli Studi di Padova.

September 2008 – July 2013 High School Graduation / Liceo Classico

Final grade: 100/100.

Liceo Classico C. Marchesi.

August 2011 – December 2011 Attended a semester at the Matignon High School – Boston (Massachusetts, USA)

First Honors, Grade 11.

RESEARCH ACTIVITY

Seminars – 30 min. seminar during the meeting of the Département Physique Moléculaire at the Institut de Physique de Rennes (France), by invitation of Prof. François Lique (October, 20, 2022).

Talks – 15 min. oral contribution at the International Symposium on Molecular Spectroscopy (June, 20–24, 2024);
– 15 min. oral contribution at the Workshop on the Collisional Excitation of Astrophysical Species in Saint Florent, France (June, 13–16, 2022);
– 15 min oral contribution at Winter Modeling 2022 – 2nd special edition (February, 14–15, 2022);
– 15 min. oral contribution at the SCI Giovani Merck Young Chemists' Symposium in Rimini (November, 22–24, 2021);
– 15 min. oral contribution at the International Symposium on Molecular Spectroscopy (June, 21–25, 2021);
– 3 min. oral contribution at the II Italian Workshop on Astrochemistry in Follonica (June, 13–16, 2018).

Chair sessions – Chair for the young research session at the Workshop on the Collisional Excitation of Astrophysical Species in Saint Florent, France (June, 13–16, 2022).

Poster Sessions – Poster presentation during the Physics and Chemistry of the Interstellar Medium Congress at École Normale Supérieure in Paris (October, 24–28, 2022);
– Poster presentation during the Congress "II Italian Workshop on Astrochemistry - Chemical Evolution in our Galaxy: Spectroscopy, Observations and Reactivity" in Follonica (June, 13–16, 2018).

- Publications**
- (1) F. Tonolo, J. Lupi, C. Puzzarini, V. Barone, (2020). The quest for a plausible formation route of formyl cyanide in the interstellar medium: a state-of-the-art quantum-chemical and kinetic approach. *ApJ*, **900**(1), 85.
- (2) S. Alessandrini, F. Tonolo, C. Puzzarini (2021). In search of phosphorus in astronomical environments: The reaction between the CP radical ($X^2\Sigma^+$) and methanimine. *J. Chem. Phys.*, **154**, 054306.
- (3) A. Melli, F. Tonolo, V. Barone, C. Puzzarini (2021). Extending the Applicability of the Semi-experimental Approach by Means of “Template Molecule” and “Linear Regression” Models on Top of DFT Computations, *J. Phys. Chem. A*, **125**(45), 9904 – 9916.
- (4) F. Tonolo, L. Bizzocchi, M. Melosso, F. Lique, L. Dore, V. Barone, C. Puzzarini (2021). An improved study of HCO+ and He system: Interaction potential, collisional relaxation, and pressure broadening, *J. Chem. Phys.*, **155**, 234306.
- (5) M. Melosso, L. Bizzocchi, H. Gazzeh, F. Tonolo, et al. (2022). Gas-phase identification of (Z)-1,2-ethenediol, a key prebiotic intermediate in the formose reaction, *Chem. Commun.*, **58**, 2750 – 2753.
- (6) V. Rivilla, L. Colzi, I. J. Serra, J. M. Pintado et al. (2022). Precursors of the RNA-world in space: Detection of (Z)-1,2-ethenediol in the interstellar medium, a key intermediate in sugar formation, *ApJL*, **929**, L11.
- (7) F. Tonolo, F. Lique, M. Melosso, C. Puzzarini, L. Bizzocchi (2022). Hyperfine resolved rate coefficients of $HC^{17}O^+$ with H_2 ($j = 0$), *MNRAS*, **516**/2, 2653 – 2661.
- (8) A. Melli, M. Melosso, L. Bizzocchi, S. Alessandrini et al. (2022). Rotational Spectra of Unsaturated Carbon Chains Produced by Pyrolysis: The Case of Propadienone, Cyanovinylacetylene, and Allenylacetylene, *J. Phys. Chem. A*, **126**(36), 6210 – 6220.

PERSONAL SKILLS

Mother tongue Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
[Common European Framework of Reference for Languages](https://www.cedefop.europa.eu/en/etools/cefr)

Communication skills

- Good communicative, organizational and mediating skills acquired as a representative of the student body in the University Evaluation Unit (Nucleo di Valutazione di Ateneo), Degree Course Council, Department Council, School of Science Council and Student Council of the University of Padua (2014 - 2017).
- High level of knowledge of the evaluation system of teaching, research and administrative activities as winner of tutoring announcement for the evaluation of teaching at the University of Bologna for the academic year 2017/2018.

Computer skills

- Competent with LaTeX, Python, Keynote, Word, Excell.
- Good knowledge of programs of chemical interest (Avogadro, Gaussian, CFOUR, Chimera, pgopher, ChemDraw, Origin, Scidavis, MestRe Nova, SPFIT/SPCAT, MolPRO, MOLSCAT).

Driving licence B