



PERSONAL
INFORMATION

Giacomo Zuccarini

 Via Vincenzo Maniconi, n. 37, 06134, Perugia, Italy +393291590722 giacomo.zuccarini@unipv.it

Sex Male | Nationality Italian

POSITION

Post-doctoral research fellow. Department of Physics, University of Pavia.
<https://fisica.unipv.it/personale/Persona.php?ID=549>

WORK EXPERIENCE

- September 2020, ongoing [Post-doctoral research fellow in Physics Education](#)
Design and validation of teaching/learning sequences on quantum physics, logic, computing, information and communication at university and secondary school level
- [University Teacher Educator](#)
- 2014, March 18 Seminar for the Physics Department. University of Linz (Austria). University Student Understanding of Quantum Mechanics.
- 2014, February 25 Seminar for the Physics Department. Roma Tre University. University Student Understanding of Quantum Mechanics.
- 2014, February 25 Seminar for the Physics Department. Technische Universität, Dresden (Germany). University Student Understanding of Quantum Mechanics.
- [Secondary School Teacher Educator](#)
- 2020, October - 2021, June Course for secondary school in-service teachers, "Piano lauree scientifiche" (PLS). Course of quantum mechanics, logic, computing, and information. University of Pavia.
- 2019, January 30 - February 15 Course for in-service teachers, "Liceo Alessi" High School, Perugia (PG); Mathematics in physics: its role and its effective use in teaching, quantum mechanics
- 2018, December 4-13 Course for in-service teachers, "Liceo Corradini" High School, Thiene (VI); Mathematics in physics: its role and its effective use in teaching, quantum mechanics
- 2018, July 23-28 National School of Modern Physics for Secondary School Teachers (SNI-FM2018, PLS; SNI-FM2017, PLS; SNI-FM2014, PLS). University of Udine.
- 2017, September 4-9 Course: curricular materials and educational strategies for the teaching of quantum mechanics. Seminar on the history of science: birth and development of the concept of light quanta.
- 2014, September 8-12 Course: curricular materials and educational strategies for the teaching of quantum mechanics. Seminar on the history of science: birth and development of the concept of light quanta.
- 2016, February 8-13 Course for in-service teachers, "Liceo Alessi" High School, Perugia: "Physics by inquiry for teaching quantum mechanics in the secondary school"

- 2015, February 16 Seminar for pre-service teachers, University of Camerino. History of science: birth and development of the concept of light-quanta.
- Teacher
- 2021, April “Percorsi per le competenze trasversali e l’orientamento” (PCTO) on quantum technologies.
- 2020, November – 2021 June “Liceo Galilei”, High School, Voghera (PV). Course of quantum mechanics, logic, computing, and information
- 2019, March 25-30 “Liceo Galilei”, High School, Trieste; Course of quantum mechanics
- 2019, January 30 “Liceo Alessi”, High School, Perugia; Course of quantum mechanics
February 15
- 2018, December 4-13 “Liceo Corradini” Thiene (VI); Course of quantum mechanics
- June 25-30, 2018 Summer School of Excellence on Modern Physics for Secondary School
June 26-July 1, 2017 Students (SENS-FM2018, SENS-FM2017, SENS-FM2016, SENS-FM2015,
June 27-July 2, 2016 SENS-FM2014, SENS-FM2013), Department of Computer science, Mathematics
July 13-18, 2015 and Physics (Formerly: Department of Chemistry, Physics and Environment),
June 23-27, 2014 University of Udine
July 22-27, 2013 Subjects: Teaching/learning sequence on the introduction of quantum mechanics,
light diffraction experiment, Malus’ law experiment
- 2016, January-June Physics Teacher, “I.S.I.S. B. Stringher” High School, Udine.
- 2016, January “Liceo Galilei” High School, Trieste; Course of quantum mechanics
- 2016, February “Liceo Alessi” High School, Perugia; Course of quantum mechanics
- 2015, March University, of Verona, Computer Science Department, Course of quantum mechanics. Related paper: Building the Basics Concepts of Quantum Mechanics with Math and Computer Science Students

EDUCATION AND TRAINING

- 2018, July Ph.D. in Mathematics and Physics
Department of Computer science, Mathematics and Physics, University of Udine,
Thesis: Relations between Observables and Student Understanding of Quantum Mechanics
- August 24-29, 2014 European Science Education Research Association (ESERA) Summer school for Ph.D. Students, Kapadokya, Turkey
- 2012, April M.D. in Physics (grade: **110/110 cum laude**)
Sapienza University of Rome, Italy
Thesis: Learning Quantum Mechanics at University Level

PERSONAL SKILLS

Mother tongue(s)
Other language(s)

	Italian				
	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	Good	Good	Good	Good	Good
German	Decent	Decent	Decent	Decent	Passable
Spanish	Decent	Decent	Decent	Decent	Passable

Communication skills

- experience in international conference talks and seminars series given during the Ph.D. Program
- intercultural skills: gained through collaboration with TU Dresden Research Unit on Physics Education during an ERASMUS STUDIO Program of 4 months in Dresden (Germany)

Computer skills

- “Excel”; “Word”; “LaTeX”; “Power Point”, “MAXQDA 11” (mixed method and qualitative data analysis)

COMPLETE PUBLICATION LIST

Articles in journals, edited books, and conference proceedings

Zuccarini, G., & Malgieri, M. (2021). Modeling and Representing Conceptual Change in the Learning of Successive Theories: The Case of the Classical-Quantum Transition. Submitted to Journal of Research in Science Teaching.

Pospiech, G., Merzel, A., Zuccarini, G., Weissman, E., Katz, G., Galili, I., Santi, L., & Michelini, M. (2021). The role of mathematics in teaching quantum physics at high school, in Jarosievitz, B. & Sükösd, C. (Eds) Teaching-learning contemporary physics, from research to practice. Springer. DOI: [10.1007/978-3-030-78720-2_4](https://doi.org/10.1007/978-3-030-78720-2_4)

Malgieri, M., Calcagnile, S., Zuccarini, G., & Onorato, P. (2021). High school student difficulties in drawing the field lines for two magnets. *Physics Education*, 56(6), 1-13. DOI: [10.1088/1361-6552/ac1a06](https://doi.org/10.1088/1361-6552/ac1a06)

Zuccarini, G. (2020) Analyzing the structure of basic quantum knowledge for instruction. *American Journal of Physics* 88, 385; DOI: [10.1119/10.0000835](https://doi.org/10.1119/10.0000835)

Michelini, M., Monti, F., Santi, L., & Zuccarini, G. (2017). Building the Basic Concepts of Quantum Mechanics with Math and Computer Science Students. In *Key Competencies in Physics Teaching and Learning*. Springer, Wroclaw, Poland; DOI: [10.1007/978-3-319-44887-9_10](https://doi.org/10.1007/978-3-319-44887-9_10)

Michelini, M. & Zuccarini, G. (2014). University students' reasoning on physical information encoded in quantum state at a point in time, in *Proceedings of PERC 2014*, Minneapolis, USA. DOI: [10.1119/perc.2014.pr.043](https://doi.org/10.1119/perc.2014.pr.043)

Zuccarini, G. (2014). Physics student ideas on quantum state and its formal representations, *Il Nuovo Cimento C*, 37(4), 273; DOI: [10.1393/ncc/i2014-11811-6](https://doi.org/10.1393/ncc/i2014-11811-6)

Zuccarini, G., & Michelini, M. (2014). Investigating Student Ideas on the

Connection Between Formal Structures and Conceptual Aspects in Quantum Mechanics, in Proceedings of GIREP-MPTL 2014, Palermo, Italy.

Zuccarini, G., Michelini, M., & Stefanel, A. (2013). Questioning with university students on stationarity, time evolution and connection between sets of eigenstates in quantum mechanics, in Proceedings of ESERA 2013, Nicosia, Cyprus

Zuccarini, G., Michelini, M., & Stefanel, A. (2013). University students' ideas on physical meaning and role of wavefunction and state vector in quantum physics, in Proceedings of ICPE 2013, Prague, Czech Republic

Zuccarini, G., Michelini, M., & Stefanel, A. (2013), Exploring university student ideas on the relationship between formal aspects and physical meanings in quantum mechanics, in Proceedings of APLIMAT 2013, Bratislava, Slovak Republic

Zuccarini, G., Michelini, M., & Stefanel, A. (2012). The complex nature of quantum wavefunction and state vector: analysis of case studies on 3rd year Italian physics students, in Proceedings of WCPE 2012, Istanbul, Turkey, pp. 1095–1102

ADDITIONAL SCIENTIFIC ACTIVITIES

Presentations at conferences

2021 ESERA Virtual Conference, Braga, Portugal
 2019 GIREP-ICPE-EPEC-MPTL, Budapest, Hungary
 2015 ESERA Conference, Helsinki, Finland
 2014 Congress of the Italian Association for Physics Teaching (AIF), Perugia, Italy
 2014 Congress of the Italian Physical Society (SIF), Pisa, Italy
 2014 PERC, Minneapolis, US
 2014 AAPT Conference, Minneapolis, US
 2014 GIREP-MPTL Conference, Palermo, Italy
 2013 Congress of the Italian Physical Society (SIF), Trieste, Italy
 2013 ESERA Conference, Nicosia, Cyprus
 2013 ICPE Conference, Prague, Czech Republic
 2013 APLIMAT Conference, Bratislava, Slovak Republic
 2012 WCPE, Istanbul, Turkey

Honours and awards

- Best Presentation Award at the Congress of the Italian Physical Society (SIF), 2013
- PERLOC Conference Grant Award (AAPT-PERC), USA, 2014

Academic visiting

ERASMUS STUDIO program at the Technische Universität, Dresden (Germany) from November 2013 to end February 2014 (4 months)

Internationally based activities

Quantum Technology Education Community
https://docs.google.com/presentation/d/175ai-r-iBn4ZM9bV9JEIrwQA3GYdBdlk7K0muEUDVE4/edit#slide=id.gc155ec22ec_171_0