
CV of Prof. Dr. Giuseppe Sansone, University of Freiburg

(1) General Data

Name: Giuseppe Sansone, Professor Dr.
Date of birth: 23.04.1977
Gender: male
Institute address: Institute of Physics, University of Freiburg
Stefan Meier Strasse 19, 79104 Freiburg
Phone: +49 (0)761 203-5738
Email: giuseppe.sansone@physik.uni-freiburg.de
Position: Experimental Physics (W3, permanent)



(2) Scientific Degrees

1996-2000 Studies of physics (Master in Physics), Final Mark 110/110 cum laude University Federico II Naples, Italy.

(3) Scientific Degrees

2013 Habilitation as Associate Professor and Full Professor in Physics (Italian Ministry for Education, University and Research).
2004 PhD in Physics, grade: *cum laude*, Politecnico Milano, Italy.

(4) Professional Employment and Experience since Graduation

2004 - 2014 Assistant Professor at the Physics Department Politecnico Milano, Italy.
2007 Short Term Postdoc at Laser Technology Laboratory RIKEN, Wako Saitama Japan.
2009-2011 Visiting Scientist at the Max Planck Institute for Nuclear Physics (group of Prof. Joachim Ullrich), Heidelberg, Germany.
2014 - 2016 Associate Professor at the Physics Department Politecnico Milano, Italy.
Since 2016 Full Professor for Experimental Physics, University of Freiburg.

(5) Honours, Distinctions and Awards, Scholarships, Medals

1999 - 2000 Erasmus Fellowship at Friedrich Schiller University, Jena (Germany).
2007 Short term PostDoc Fellowship; Laser Technology Laboratory RIKEN, Japan
Japan Society for the Promotion of Science (JSPS).
2009 - 2011 Fellowship for experienced researchers of the Alexander von Humboldt Foundation, Germany.
2009 - 2011 Marie-Curie Intraeuropean Fellowship (offer declined due to incompatibility with AvH fellowship).
2015-2018 Scientific Coordinator of the Marie Skłodowska-Curie Actions Innovative Training Networks (ITN) MEDEA "Molecular Electron Dynamics investigated by Intense Fields and Attosecond Pulses".
2020 Innovation Award on Synchrotron Radiation 2020 Helmholtz-Zentrum Berlin (HZB) (price shared with Dr. L. Giannessi, Dr. C. Callegari, Dr. K. Prince).

(6) Supervisory Work

Supervision of 5 Bachelor students, 8 Master students, 9 PhD students, and 7 Postdocs.

(7) Selected Professional Memberships

Since 2012	Advisor and Member of the Scientific Board of the large-scale facility ELI-ALPS, Szeged, Hungary.
2018	Program Co-Chair of the 2018 OSA conference on High-Intensity Lasers and High-Field Phenomena (HILAS), March 2018 Strasbourg, France.
2019 - 2021	Dean of Studies, Institute of Physics; Faculty of Mathematics and Physics, University of Freiburg.
Since 2019	Member of the European XFEL User Organization Executive Committee
2020-2022	General Co-Chair of the 2020 and 2022 OSA conference on High-Intensity Lasers and High-Field Phenomena (HILAS).

(8) Selected Research Topics and Accomplishments

➤ First complete characterization of isolated attosecond pulses

I demonstrated the first complete characterization of an isolated attosecond pulse using the Polarization Gating technique for confining in time the harmonic generation process.

➤ First experimental demonstration of the control of the electronic dynamics in a molecule on the attosecond time scale

In the framework of a large European collaboration, I demonstrated for the first time the possibility to control the electronic dynamics in dissociating hydrogen (deuterium) molecules on the attosecond timescale. The experiment was based on the combination of an isolated attosecond waveform and a few-cycle CEP stabilized laser pulse. The control of the electronic dynamics was measured by localizing the electron on one of the two nuclei during the molecular dissociation.

➤ Coherent control and first demonstration of train of attosecond trains and attosecond pulse shaping using a seeded Free-Electron Laser.

Since 2012, I have been the Principal Investigator of six beamtimes at the seeded FEL FERMI and one beamtime at the EuXFEL.

- “Nonlinear excitation of Interatomic Coulombic Decay” (12.2012)
- “Complete characterization of the auto-ionization process in neon ions” (12.2013)
- “Attosecond control of electronic wave packets by quantum-path interference under the influence of intense infrared fields” (11.2015)
- “Attosecond pulse shaping using a seeded FEL” (12.2017)
- “Role of resonant and non-resonant Auger decay in the generation of highly charged ions by valence and core-shell sequential ionization” (06.2019)
- “Nonlinear spectroscopy of Auger decay in krypton” EuXFEL (11.2020)
- “Investigation of the continuum-continuum phase in multi-infrared-photon transitions” (09.2021)

During these beamtimes, the first demonstration of coherent control in the XUV spectral range and the generation of attosecond pulse trains using a FELs were acquired. In the publication P. Maroju et al. *Nature* **578**, 386-391 (2020), my research group demonstrate the complete shaping (amplitude and phase) of attosecond pulses.

(9) Ten Selected Publications

- [1] C. Callegari et al., *Physics Reports* **904**, 1-59 (2021).
- [2] P. Maroju et al., *Nature* **578**, 386-391 (2020).
- [3] A. Wituschek, et al., *Nat. Commun.* **11** (883), 1-7 (2020).
- [4] P. A. Carpeggiani, et al., *Nat. Physics* **15**, 170 (2019).
- [5] P. A. Carpeggiani et al., *Nat. Photonics* **11**, 383-389 (2017).
- [6] L. Seiffert et al., *Nat. Physics* **13**, 766-770 (2017).
- [7] K. C. Prince, et al., *Nat. Photonics* **10**, 176-179 (2016).
- [8] G. Sansone et al., *Nat. Photonics* **5**, 655-663 (2011).
- [9] G. Sansone et al., *Nature* **465**, 763-766 (2010).
- [10] G. Sansone et al., *Science* **314**, 443-446 (2006).