

CV of Angela TRAPANANTI, PhD

School of Science and Technology
Physics Division
University of Camerino, Camerino (MC), Italy

Current position (since December 2018):

Tenure-track assistant professor (RTD-B) at University of Camerino, School of Science and Technology - Physics Division

Scientific profile and research activity

The main research activity concerns structural studies of condensed matter by x-ray absorption spectroscopy (XAS) and diffraction techniques with synchrotron radiation. Studies are mainly focused on disordered systems (liquids and glasses), also under extreme conditions and novel materials, mostly for energy storage applications. She is also involved in the development of XAS data analysis methods based on molecular modeling (Reverse Monte Carlo).

Employment History

2017-2018: **Fixed term Research Assistant (RTD-A)** at University of Camerino

2015-2017: **Researcher** at Consiglio Nazionale delle Ricerche (CNR)-IOM Perugia

2009-2015: **Researcher** at Consiglio Nazionale delle Ricerche (CNR)-IOM and beamline scientist BM08@ESFR Grenoble (France)

2008-2009: **Researcher (fixed term)** at Sincrotrone Trieste and Univ. Camerino

2005-2008: **Post-doctoral researcher** at the European Synchrotron Radiation Facility (ESRF), Grenoble (France)

Education

2005 - Ph.D. in Physics - University of Camerino, Italy

Thesis in experimental condensed matter physics titled: *"Local ordering in liquid metals under high pressure and high temperature conditions: an x-ray absorption study"*. Supervisor: Prof. A. Di Cicco

2001 - Laurea in Physics- University of Camerino, Italy

Thesis titled: *"Local structure and phase transitions in superionic Copper Iodide probed by x-ray absorption and diffraction"*. Supervisor: Prof. A. Di Cicco. 110/110 summa cum Laude

Teaching activity

Qualified as Associate Professor in Experimental condensed matter physics (Abilitazione Scientifica Nazionale SC 02/B1) and **qualified as Maître de Conférences** (Sections 28 and 33, CNU France)

2017-2020: Lecturer at the **University of Camerino** [*"Physics"* (B.Sc. Biosciences and Biotechnology, 7 CFU), *"Tecnologie e dispositivi per l'energia"* (B. Sc. Physics, 3 CFU), *"Tecniche di misura e trattamento dati"* (B. Sc. Physics, 2 CFU), *"Fisica 1"* (B. Sc. Chemistry, 4 CFU)]

2009: Adjunct Professor at the **University of Camerino** [*"Physics"* (B.Sc. Mathematics and Computer Science, 6 CFU)].

2007-2015: Interim lecturer at the **HERCULES** (Higher European Research Course for Users of Large Experimental Systems), **Grenoble** [82 hours]

2006-2008: Interim lecturer at the **"Ecole Nationale Supérieure de Physique"**, **Grenoble** [32 hours]

Professional and institutional service

since 2019: delegate for Tutoring activities for the degree courses in Physics L-30 and LM-17

since 2018: Member of the Proposal Review Panel (PRC3 “Matter and material properties: Structure, Organisation, Caractérisation, Elaboration”) for access to the **SOLEIL synchrotron source** (France)

since 2016: Member of the Proposal Review Panel (Applied Physics and Material Science) for access to the CERIC-ERIC (Central European Research Infrastructure Consortium).

2016-2018: Member of the Proposal Review Panel (Hard Condensed Matter-Structures) for access to the **ELETTRA synchrotron source** (Italy)

2016: Reviewer for research projects submitted to the National Research, Development and Innovation Office (**NKFIH**) of Hungary

since 2006: Referee for *Physical Review B*, *Physical Review Letters*, *Scientific Reports (NPG)*, *Journal of Magnetism and Magnetic Materials*, *High Pressure Research*, *Journal of Chemical Physics*, *Solid State Ionics*, *ACS Applied Energy Materials*, *ACS Applied Materials & Interfaces*

Grants and Awards:

since 2002: co-proposer of ~80 **proposals for experiments at synchrotron radiation facilities** (12 as PI) (~120 hours of beamtime + travel expenses for 2-3 researchers).

since 2019: member of the **VIRGO Coatings R&D collaboration**. Project CRD (structural characterization of amorphous coatings for gravitational waves detectors). Coordinator: Prof. G. Cagnoli (Univ. Lyon). (RU member)

2017-2020: Progetto PRIN 2015 (MIUR): NEWLI: NEW Light on transient states in condensed matter by advanced photon-electron spectroscopies. Coordinator: Prof. Federico Boscherini (Univ. Bologna). 463 kEuro. (RU member)

2017-2019: Progetto Programma Nazionale di Ricerche in Antartide 2016 (MIUR): Meteoriti antartiche. Coordinator: Prof. Luigi Folco (Univ. Pisa). 87.9 kEuro. (RU member).

2012-2014: PIK (ELETTRA-Sincrotrone Trieste): EX-PRO-REL: EXcitation PROCesses and RELaxation in condensed matter and nanostructures. Coordinator: Prof. Federico Boscherini (Univ. Bologna). 210 kEuro. (RU member)

2011-2012: Joint Project CNR-FCT (Fundação para a Ciência e a Tecnologia) Portugal: Local structure and functionality in glass-ceramics and core shells nanoparticles doped with Rare Earth ions by XAFS spectroscopy. Coordinators: Dr. F.d'Acapito (CNR-IOM)-Luis Santos (FCT-Lisboa). 5 kEuro. (RU member)

2002: Young Researchers Project (Università di Camerino): Studio delle transizioni di fase strutturali in solidi superionici in condizioni di alta temperatura ed alta pressione. 1.8 kEuro (PI)

2002: INFM Award for Young Scientific Authors

Participation and Organization of Conferences

Participation in ~35 **national and international conferences** with oral (12, 4 invited talks) and poster contributions. More than 10 invited seminars at international universities and research centers.

Chair of the “27th Conference of the Italian Synchrotron Radiation Society (SILS2019)”, 9-11 September 2019, Camerino (Italy) (~ 120 participants)

Member of the local organizing committee of the “XAFS14-14th International Conference on X-ray Absorption Fine Structure (XAFS14)”, 26-31 July 2009, Camerino (Italy) (~ 500 participants)

Member of the national organizing committee of the international "LAMI4- XIV Liquid and Amorphous Metals conference", 11-16 July 2010, Rome (Italy) (~ 200 participants)

Scientific production

Peer reviewed journals publications : 81

Book chapters: 2 + 1 volume in preparation as editor

Non-refereed publications: 9

h-index (Scopus, Nov. 2020): 18

List of publications (of the last 10 years)

- [1] A. Di Cicco, G. Polzoni, R. Gunnella, A. Trapananti, M. Minicucci, S. J. Rezvani, D. Catone, L. Di Mario, J. S. Pelli Cresi, S. Turchini, F. Martelli. *Broadband optical ultrafast reflectivity of Si, Ge and GaAs*, Scientific Reports 10, 17363 (2020)
- [2] R. Abbott *et al*, The Astrophysical Journal Letters, 902, L21 (2020)
- [3] F. Acernese *et al.*, Phys. Rev. Lett. 125, 131101 (2020)
- [4] M. Ciambezi, A. Trapananti, S. J. Rezvani, F. Maroni, D. Bresser, M. Minicucci, F. Nobili, R. Gunnella, S. Passerini, A. Di Cicco, *Initial lithiation of carbon-coated zinc ferrite anodes studied by in-situ X-ray absorption spectroscopy*. Radiation Physics and Chemistry 175, 108468 (2020).
- [5] Y. Mijiti, A. Trapananti, M. Minicucci, M. Ciambezi, J. Coquet, L. Nataf, F. Baudelet, A. Di Cicco, *Development of a high temperature diamond anvil cell for x ray absorption experiments under extreme conditions*. Radiation Physics and Chemistry 175,108106 (2020).
- [6] F. Iesari, A. Trapananti, S. De Panfilis, A. Di Cicco, *Structure of liquid In₂₀Sn₈₀ at high temperature: a XAS study*. Radiation Physics and Chemistry 175, 108089 (2020).
- [7] R. Parmar, S. J. Rezvani, F. Nobili, A. Di Cicco, A. Trapananti, M. Minicucci, S. Nannarone, A. Giglia, F. Maroni, R. Gunnella, *Electrochemical Response and Structural Stability of the Li⁺ Ion Battery Cathode with Coated LiMn₂O₄ Nanoparticles*. ACS Appl. Energy Mater. 3, 8356–8365 (2020).
- [8] A. Filipponi, G. Profeta, N. Di Marco, V. Zema, K. Schäffner, F. Reindl, M. Harfouche, A. Trapananti, A. Di Cicco, *Local lattice relaxation around TI substitutional impurities in a NaI(Tl) scintillator crystal*. Radiation Physics and Chemistry 177, 108992 (2020).
- [9] Y. Mijiti, M. Perri, J. Coquet, L. Nataf, M. Minicucci, A. Trapananti, T. Irifune, F. Baudelet, A. Di Cicco, *A new internally heated diamond anvil cell system for time-resolved optical and x-ray measurements*. Review of Scientific Instruments. 91, 085114 (2020).
- [10] F. Villa, A. Balerna, E. Chiadroni, A. Cianchi, M. Coreno, S. A. Dabagov, A. Di Cicco, R. Gunnella, A. Marcelli, C. Masciovecchio, M. Minicucci, S. Morante, J. Rezvani, T. Scopigno, F. Stellato and A. Trapananti, *Photon beam line of the water window FEL for the EuPRAXIA@SPARC_LAB project*. Journal of Physics: Conference Series 1596 (1), 012039 (2020).
- [11] S. J. Rezvani, Y. Mijiti, R. Gunnella, F. Nobili, A. Trapananti, M. Minicucci, M. Ciambezi, D. Bresser, S. Nannarone, S. Passerini, A. Di Cicco, *Structure rearrangements induced by lithium insertion in metal alloying oxide mixed spinel structure studied by x-ray absorption near-edge spectroscopy*. Journal of Physics and Chemistry of Solids. 136, 109172 (2020).

- [12] A. Baldinelli, L. Barelli, G. Bidini, A. Di Cicco, R. Gunnella, M. Minicucci, A. Trapananti, *Advancements regarding in-operando diagnosis techniques for solid oxide cells NiYSZ cermets*. AIP Conference Proceedings. 2191, 020012 (2019).
- [13] S. Boccatto, R. Torchio, P. D'Angelo, A. Trapananti, I. Kantor, V. Recoules, S. Anzellini, G. Morard, T. Irifune, S. Pascarelli, *Experimental determination by x-ray absorption spectroscopy of liquid nickel and cobalt compression under extreme conditions*. Phys. Rev. B 100 (18), 180101 (2019).
- [14] M. Zarrabeitia, E. Gonzalo, M. Pasqualini, M. Ciambezi, O. Lakuntza, F. Nobili, A. Trapananti, A. D. Cicco, G. Aquilanti, N. A. Katcho, J. M. L. del Amo, J. Carrasco, M. Á. Muñoz-Márquez, T. Rojo, *Unraveling the role of Ti in the stability of positive layered oxide electrodes for rechargeable Na-ion batteries*. J. Mater. Chem. A. 7, 14169–14179 (2019).
- [15] A. Balerna et al., *The Potential of EuPRAXIA@SPARC_LAB for Radiation Based Techniques*. Condensed Matter. 4, 30 (2019).
- [16] A. Moretti, G. Giuli, A. Trapananti, S. Passerini, *Electrochemical and structural investigation of transition metal doped V2O5 sono-aerogel cathodes for lithium metal batteries*. Solid State Ionics. 319, 46–52 (2018).
- [17] A. Di Cicco, F. Iesari, A. Trapananti, P. D'Angelo, A. Filipponi, *Structure and atomic correlations in molecular systems probed by XAS reverse Monte Carlo refinement*. The Journal of Chemical Physics. 148, 094307 (2018).
- [18] C. Maurizio, R. Edla, N. Michieli, M. Orlandi, A. Trapananti, G. Mattei, A. Miotello, *Two-step growth mechanism of supported Co3O4-based sea-urchin like hierarchical nanostructures*. Applied Surface Science. 439, 876–882 (2018).
- [19] M. Quaretti, M. Porchia, F. Tisato, A. Trapananti, G. Aquilanti, M. Damjanović, L. Marchiò, M. Giorgetti, M. Tegoni, *Thermodynamic stability and structure in aqueous solution of the [Cu(PTA)4]⁺ complex (PTA = aminophosphine-1,3,5-triaza-7phosphaadamantane)*. Journal of Inorganic Biochemistry. 188, 50–61 (2018).
- [20] R. Chahal, F. Starecki, J.-L. Doualan, P. Němec, A. Trapananti, C. Prestipino, G. Tricot, C. Boussard-Pledel, K. Michel, A. Braud, P. Camy, J.-L. Adam, B. Bureau, V. Nazabal, *Nd³⁺:Ga-Ge-Sb-S glasses and fibers for luminescence in mid-IR: synthesis, structural characterization and rare earth spectroscopy*. Opt. Mater. Express, OME. 8, 1650–1671 (2018).
- [21] G. Giuli, T. Eisenmann, D. Bresser, A. Trapananti, J. Asenbauer, F. Mueller, S. Passerini, *Structural and Electrochemical Characterization of Zn1-xFexO—Effect of Aliovalent Doping on the Li⁺ Storage Mechanism*. Materials 2018 11, 49.
- [22] A. Minelli, P. Dolcet, S. Diodati, S. Gardonio, C. Innocenti, D. Badocco, S. Gialanella, P. Pastore, L. Pandolfo, A. Caneschi, A. Trapananti, S. Gross, *Pursuing the stabilisation of crystalline nanostructured magnetic manganites through a green low temperature hydrothermal synthesis*. J. Mater. Chem. C. 5, 3359–3371 (2017).
- [23] A. Filipponi, A. D. Cicco, F. Iesari, A. Trapananti, *The structure of liquid metals probed by XAS*. EPJ Web Conf. 151, 01001 (2017).
- [24] P. Stabile, G. Giuli, M. R. Cicconi, E. Paris, A. Trapananti, H. Behrens, *The effect of oxygen fugacity and Na/(Na+K) ratio on iron speciation in pantelleritic glasses*. Journal of Non-Crystalline Solids. 478, 65–74 (2017).
- [25] B. Srinivasan, S. Cui, C. Prestipino, A. Gellé, C. Boussard-Pledel, S. Ababou-Girard, A. Trapananti, B. Bureau, S. Di Matteo, *Possible Mechanism for Hole Conductivity in Cu-As-Te Thermoelectric Glasses: A XANES and EXAFS Study*. J. Phys. Chem. C. 121, 14045–14050 (2017).

- [26] F. Iesari, A. Trapananti, M. Minicucci, A. Filipponi, A. Di Cicco, *An investigation of the structure of liquid Zn by X-ray absorption spectroscopy*. Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms. 411, 68–71 (2017).
- [27] F. Tisato, C. Marzano, V. Peruzzo, M. Tegoni, M. Giorgetti, M. Damjanovic, A. Trapananti, A. Bagno, C. Santini, M. Pellei, M. Porchia, V. Gandin, *Insights into the cytotoxic activity of the phosphane copper(I) complex [Cu(thp)₄][PF₆]*. J. Inorg. Biochem. 165, 80–91 (2016).
- [28] I. Pethes, R. Chahal, V. Nazabal, C. Prestipino, A. Trapananti, S. Michalik, P. J v ri, *Chemical Short-Range Order in Selenide and Telluride Glasses*. J. Phys. Chem. B. 120, 9204–9214 (2016).
- [29] S. J. Rezvani, M. Ciambezi, R. Gunnella, M. Minicucci, M. A. Mu oz, F. Nobili, M. Pasqualini, S. Passerini, C. Schreiner, A. Trapananti, A. Witkowska, A. Di Cicco, *Local Structure and Stability of SEI in Graphite and ZFO Electrodes Probed by As K-Edge Absorption Spectroscopy*. J. Phys. Chem. C. 120, 4287–4295 (2016).
- [30] F. d’Acapito, A. Trapananti, A. Puri, *LISA: the Italian CRG beamline for x-ray Absorption Spectroscopy at ESRF*. J. Phys.: Conf. Ser. 712, 012021 (2016).
- [31] I. Pethes, R. Chahal, V. Nazabal, C. Prestipino, A. Trapananti, C. Pantalei, B. Beuneu, B. Bureau, P. J v ri, *Short range order in Ge-Ga-Se glasses*. J. Alloy. Compd. 651, 578–584 (2015).
- [32] S. Pollastri, F. D’Acapito, A. Trapananti, I. Colantoni, G. B. Andreatti, A. F. Gualtieri, *The chemical environment of iron in mineral fibres. A combined X-ray absorption and M ssbauer spectroscopic study*. J. Hazard. Mater. 298, 282–293 (2015).
- [33] P. Centomo, C. Meneghini, S. Sterchele, A. Trapananti, G. Aquilanti, M. Zecca, *In Situ X-ray Absorption Fine Structure Spectroscopy of a Palladium Catalyst for the Direct Synthesis of Hydrogen Peroxide: Leaching and Reduction of the Metal Phase in the Presence of Bromide Ions*. ChemCatChem. 7, 3712–3718 (2015).
- [34] T. Cesca, B. Kalinic, N. Michieli, C. Maurizio, A. Trapananti, C. Scian, G. Battaglin, P. Mazzoldi, G. Mattei, *Au-Ag nanoalloy molecule-like clusters for enhanced quantum efficiency emission of Er³⁺ ions in silica*. Phys. Chem. Chem. Phys. 17, 28262–28269 (2015).
- [35] G. Giuli, A. Trapananti, F. Mueller, D. Bresser, F. d’Acapito, S. Passerini, *Insights into the Effect of Iron and Cobalt Doping on the Structure of Nanosized ZnO*. Inorg. Chem. 54, 9393–9400 (2015).
- [36] G. Aquilanti, A. Trapananti, A. Karandikar, I. Kantor, C. Marini, O. Mathon, S. Pascarelli, R. Boehler, *Melting of iron determined by X-ray absorption spectroscopy to 100 GPa*. PNAS. 112, 12042–12045 (2015).
- [37] C. Maurizio, T. Cesca, B. Kalinic, A. Trapananti, C. Scian, G. Battaglin, P. Mazzoldi, G. Mattei, *Gold-based nucleation in implanted silica studied by x-ray absorption spectroscopy*. Ceram. Int. 41, 8660–8664 (2015).
- [38] P. Centomo, C. Meneghini, S. Sterchele, A. Trapananti, G. Aquilanti, M. Zecca, *EXAFS in situ: The effect of bromide on Pd during the catalytic direct synthesis of hydrogen peroxide*. Catal. Today. 248, 138–141 (2015).
- [39] C. Maurizio, R. Checchetto, A. Trapananti, A. Rizzo, F. D’Acapito, A. Miotello, *In Situ X-ray Absorption Spectroscopy-X-ray Diffraction Investigation of Nb-H Nanoclusters in MgH₂ during Hydrogen Desorption*. J. Phys. Chem. C. 119, 7765–7770 (2015).

- [40] D. Medas, P. Lattanzi, F. Podda, C. Meneghini, A. Trapananti, A. Sprocati, M. A. Casu, E. Musu, G. D. Giudici, *The amorphous Zn biomineralization at Naracauli stream, Sardinia: electron microscopy and X-ray absorption spectroscopy*. Environ. Sci. Pollut. Res. 21, 6775–6782 (2014).
- [41] C. Maurizio, T. Cesca, A. Trapananti, B. Kalinic, C. Scian, P. Mazzoldi, G. Battaglin, G. Mattei, *Effect of ultrasmall Au-Ag aggregates formed by ion implantation in Er-implanted silica on the 1.54 μm Er³⁺ luminescence*. Nucl. Instrum. Meth. B. 326, 11–14 (2014).
- [42] G. Giuli, M. R. Cicconi, A. Trapananti, S. G. Eeckhout, G. Pratesi, E. Paris, C. Koeberl, *Iron Redox Variations in Australasian Muong Nong-type Tektites*. Meteorit. Planet. Sci. 48, A143–A143 (2013).
- [43] A. Moretti, G. Giuli, F. Nobili, A. Trapananti, G. Aquilanti, R. Tossici, R. Marassi, *Structural and Electrochemical Characterization of Vanadium-Doped LiFePO₄ Cathodes for Lithium-Ion Batteries*. J. Electrochem. Soc. 160, A940–A949 (2013).
- [44] G. Taglieri, C. Mondelli, V. Daniele, E. Pusceddu, A. Trapananti, *Synthesis and X-Ray Diffraction Analyses of Calcium Hydroxide Nanoparticles in Aqueous Suspension*. Advances in Materials Physics and Chemistry 3, 108 (2013).
- [45] S. Fazzini, D. Nanni, B. Ballarin, M. C. Cassani, M. Giorgetti, C. Maccato, A. Trapananti, G. Aquilanti, S. I. Ahmed, *Straightforward Synthesis of Gold Nanoparticles Supported on Commercial Silica-Polyethyleneimine Beads*. J. Phys. Chem. C. 116, 25434–25443 (2012).
- [46] I. Cianchetta, I. Colantoni, F. Talarico, F. d'Acapito, A. Trapananti, C. Maurizio, S. Fantacci, I. Davoli, *Discoloration of the smalt pigment: experimental studies and ab initio calculations*. J. Anal. At. Spectrom. 27, 1941–1948 (2012).
- [47] L. Banci, I. Bertini, O. Blaževič, V. Calderone, F. Cantini, J. Mao, A. Trapananti, M. Vieru, I. Amori, M. Cozzolino, M. T. Carrì, *Interaction of Cisplatin with Human Superoxide Dismutase*. J. Am. Chem. Soc. 134, 7009–7014 (2012).
- [48] F. Coppari, A. Polian, N. Menguy, A. Trapananti, A. Congeduti, M. Newville, V. B. Prakapenka, Y. Choi, E. Principi, A. Di Cicco, *Pressure-induced transformations in amorphous Si-Ge alloy*. Phys. Rev. B. 85, 045201 (2012).
- [49] E. Giangrisostomi, M. Minicucci, A. Trapananti, A. Di Cicco, *Multiple-scattering x-ray absorption analysis of quartzlike, rutilelike, and amorphous germanium dioxide*. Phys. Rev. B. 84, 214202 (2011).
- [50] C. Coussa-Simon, C. Martinet, D. De Ligny, T. Deschamps, A. Trapananti, B. Champagnon, *Permanent Ge Coordination Change Induced by Pressure in La₂O₃-B₂O₃-GeO₂ Glass*. J. Am. Ceram. Soc. 93, 2726–2730 (2010).
- [51] F. Coppari, A. D. Cicco, E. Principi, A. Trapananti, N. Pinto, A. Polian, S. Chagnot, A. Congeduti, *Combination of optical and X-ray techniques in the study of amorphous semiconductors under high pressure: an upgrade setup for combined XAS and XRD measurements*. High Pressure Res. 30, 28–34 (2010).
- [52] M. Vaccari, G. Garbarino, G. Aquilanti, M.-V. Coulet, A. Trapananti, S. Pascarelli, M. Hanfland, E. Stavrou, C. Raptis, *Structural changes in amorphous GeS₂ at high pressure*. Phys. Rev. B. 81, 014205 (2010).
- [53] S. Pascarelli, M. P. Ruffoni, A. Trapananti, O. Mathon, C. Detlefs, M. Pasquale, A. Magni, C. P. Sasso, F. Celegato, E. Olivetti, Y. Joly, D. Givord, *4f charge-density deformation and magnetostrictive bond strain observed in amorphous TbFe₂ by x-ray absorption spectroscopy*. Phys. Rev. B. 81, 020406 (2010).