

Curriculum Vitae

Personal information

Contacts:

E-Mail: -----

Phone: -----

Address: -----

Gender: -----

Date of birth: -----

Place of birth: -----

Employment history

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| 01/08/2022 – present | post-doctoral research position at Istituto Officina dei Materiali of the Centro Nazionale della Ricerca (IOM-CNR) in the group of Dr. Cinzia Cepek |
| 01/12/2019 – 31/07/2022 | post-doctoral research position at the Fritz Haber Institute, Berlin, group of Dr. Katarzyna Skorupska and dr. Axel Knop-Gericke |
| 01/11/2018 – 31/10/2019 | post-doctoral research position at the University of Trieste, group of Prof. Erik Vesselli |

Education

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| 01/11/2015 – 30/10/2018 | doctorate (Ph.D.) in Nanotechnologies, at the University of Trieste, Department of Physics, under the supervision of Prof. Alberto Morgante and Dr. Albano Cossaro. Thesis title: "Hetero-organic assembly of functionalized molecules on low-dimensional materials" The final doctoral exam was sustained on 30/04/2019 |
| 30/09/2013 – 17/07/2015 | M.Sc. degree in Chemistry at the University of Trieste, Department of Chemical and Pharmaceutical Sciences under the supervision of Prof. Paolo Fornasiero and Dr. Valentina Gombac. Thesis title: "Ni ₂ P based catalyst for hydrogen production". Final degree mark: 110/110 with distinction |
| 20/09/2010 – 27/09/2013 | B.Sc. degree in Chemistry at the University of Trieste, under the supervision of Prof. Silvano Geremia. Thesis title: "Molecular recognition of amino acids with resorcinarene systems". Final degree mark: 110/110 with distinction |

Skills

During my academic studies, I have been involved in different fields of chemistry and physics. Starting from my master's degree thesis, I studied heterogeneous catalysis employing novel materials such as metal phosphides. In this context, I was involved in the investigation of the hydrogen production through photocatalysis. During my PhD, which played the major role in my education, I worked at the ALOISA beamline of the ELETTRA synchrotron facility. The main topic of the research was molecular systems under ultra high vacuum (UHV) conditions, and I got familiar with X-ray based techniques such as XPS, NEXAFS and RESPES. Together with the colleagues, I investigated the behavior of different molecules on surfaces, in particular the boronic acid condensation on metal substrates. Focusing on this chemical reaction, we were able to synthesize different complex architectures on metallic surfaces, including a novel 2D boron and oxygen containing material. We also investigated weak intramolecular interactions for the same purpose of forming bidimensional structures. To the best of our knowledge, we employed for the first-time crown ether molecules in UHV on a surface for the interaction with an alkali metal. Moreover, during my PhD, I spent three months at Uppsala University, Sweden, in the group of prof. Carla Puglia where I had the possibility to participate in the research on graphitic carbon nitride related materials for photocatalytic applications.

After the PhD, I joined the group of prof. Erik Vesselli, where I was introduced to the sum frequency generation technique to study molecular systems on metal surfaces. This position allowed me to learn not only a new technique, but I also gained experience with Near Ambient Pressure (NAP) environment since the experimental setup I worked with was able to operate in a wide pressure range, from UHV to the millibar range. This aspect makes it a suitable choice for the investigation of model catalysts, biomimetic systems as well as of bidimensional materials. We studied molecules of biological interest such as porphyrins and their interaction with gas phase molecules as O₂, NO or NO₂.

After the post-doctoral position in the group of prof. Vesselli, I joined the Fritz Haber institute in Berlin, where I had the opportunity to exploit once more the synchrotron light for my research. In particular, the institute is running three beamlines at the BESSY II synchrotron facility, namely Belchem, ISS and CAT, specialized in NAP XPS and NEXAFS. I was involved in the study of thin metal films of Pd on various substrates such as Si, SiO₂ and ZnO, for catalytic purposes. Thanks to my position at Fritz Haber institute, I gained insights into the stimulating exchange involving the physics of synchrotron light based techniques and chemical research in fields such as heterogeneous catalysis.

In my current position, at the Istituto Officina dei Materiali of the Centro Nazionale della Ricerca (IOM-CNR), I am working in the group of Dr. Cinzia Cepek on graphene synthesis from molecular precursors. We study the use of porphyrins and phthalocyanines coordinated with different metal ions to obtain graphene with transition metal doping. Moreover, I also participate to the investigation of tungsten-carbon nanotubes hybrid materials.

In summary, my personal experience covers the most common X-ray based techniques, such as XPS and NEXAFS, in UHV conditions as well as in NAP environment. In addition, I have always been very eager to learn new methodologies.

Communication skills

My education and work experiences in various work groups, gave me the possibility to develop my communication skills and my ability for teamwork. I feel confident in working in both small collectives and larger groups. My international experience in Sweden and Germany, where I have lived for more than 2 years, allowed me to gain valuable insights in the specific benefits and challenges of working in a multicultural environment.

Language skills

Italian native speaker

English very good

Slovak fluent

Participation to conferences

Poster session 54. Jahrestreffen Deutscher Katalytiker

Oral contribution ECOS, Aarhus, Denmark 2018

Poster session FisMat, Trieste, Italy 2017

Publications

I have 19 publications with a h-index of 10 and 199 total citations (Google Scholar – 25.05.2023)

- 1) On-Surface Synthesis of Boroxine-Based Molecules, E. Turco, m. Stredansky, R. Costantini, J. A. Martinez, M. Dell'Angela, E. Zerbato, D. Toffoli, G. Fronzoni, A. Morgante, L. Floreano, A. Cossaro, Chemistry 2021, 3(4), 1401-1410; <https://doi.org/10.3390/chemistry3040101>
- 2) Room-Temperature On-Spin-Switching and Tuning in a Porphyrin-Based Multifunctional Interface, H. M. Sturmeit, I. Cojocariu, A. Windischbacher, P. Puschnig, C. Piamonteze, M. Jugovac, A. Sala, C. Africh, G. Comelli, A. Cossaro, A. Verdini, L. Floreano, M. Stredansky, E. Vesselli, C. Hohner, M. Kettner, J. Libuda, C. M. Schneider, G Zamborlini, M. Cinchetti, and V. Feyer, Small 2021, 2104779
- 3) Self-metalation of porphyrins at the solid-gas interface, F. Armillotta, E. D'Incecco, M. Corva, M. Stredansky, J.-J. Gallet, F Borunel, A. Goldoni, A. Morgante, E. Vesselli, and A. Verdini, Angew. Chem. Int. Ed. 10.1002/anie.202111932
- 4) Tailoring surface-supported water–melamine complexes by cooperative H-bonding interactions, V. Lanzilotto, C. Grazioli, M. Stredansky, T. Zhang, L Schio, A. Goldoni, L. Floreano, A. Motta, A. Cossaro and C. Puglia, Nanoscale Adv., 2021, 3, 2359-2365
- 5) Methylamine terminated molecules on Ni(1 1 1): A path to low temperature synthesis of nitrogen-doped graphene, R. Costantini, H. Ustunel, Z. Feng, M. Stredansky, D. Toffoli, G. Fronzoni, C. Dri, G. Comelli, D. Cvetko, G. Kladnik, G. Bavdek, L. Floreano, A. Morgante and A. Cossaro, FlatChem Volume 24, November 2020, 100205

- 6) Dioxygen at Biomimetic Single Metal-Atom Sites: Stabilization or Activation? The Case of CoTPyP/Au(111), F. Armillotta, A. Pividori, M. Stredansky, N. Seriani and E. Vesselli, *Topics in Catalysis* volume 63, pages 1585–1595(2020)
- 7) Molecular anchoring stabilizes low valence Ni(I)TPP on copper against thermally induced chemical changes, H. M. Sturmeit, I. Cojocariu, M. Jugovac, A. Cossaro, A. Verdini, L. Floreano, A. Sala, G. Comelli, S. Moro, M. Stredansky, M. Corva, E. Vesselli, P. Puschnig, C. M. Schneider, V. Feyer, G. Zamborlini and M. Cinchetti, *J. Mater. Chem. C*, 2020, 8, 8876-8886
- 8) Keto–enol tautomerization drives the self-assembly of leucoquinizarin on Au(111), R. Costantini, L. Colazzo, L. Batini, M. Stredansky, M. S. G. Mohammed, S. Achilli, L. Floreano, G. Fratesi, D. G. de Oteyza and A. Cossaro, *Chem. Commun.*, 2020, 56, 2833-2836
- 9) Vibronic Fingerprints of the Nickel Oxidation States in Surface-Supported Porphyrin Arrays, M. Stredansky, S. Moro, M. Corva, M. Jugovac, G. Zamborlini, V. Feyer, C. M. Schneider, I. Cojocariu, H. M. Sturmeit, M. Cinchetti, A. Verdini, A. Cossaro, L. Floreano and E. Vesselli, *J. Phys. Chem. C* 2020, 124, 6297–6303
- 10) Strain Induced Orbital Dynamics Across the Metal Insulator Transition in Thin VO₂/TiO₂ (001) Films, A. D'Elia, S. J. Rezvani, A. Cossaro, M. Stredansky, C. Grazioli, B. W. Li, C. W. Zou, M. Coreno, A. Marcelli, *Journal of Superconductivity and Novel Magnetism* (2020) 33:2383–2388
- 11) Evaluation of molecular orbital symmetry via oxygen-induced charge transfer quenching at a metal-organic interface, I. Cojocariu, H. M. Sturmeit, G. Zamborlini, A. Cossaro, A. Verdini, L. Floreano, E. D'Incecco, M. Stredansky, E. Vesselli, M. Jugovac, M. Cinchetti, V. Feyer and C. M. Schneider, *Applied Surface Science*, Volume 504, 28 February 2020, 144343
- 12) Correlation effects in B1s core-excited states of boronic-acid derivatives: An experimental and computational study, D. Toffoli, A. Ponzi, E. Bernes, M. de Simone, C. Grazioli, M. Coreno, M. Stredansky, A. Cossaro and Giovanna Fronzoni, *J. Chem. Phys.* 151, 134306 (2019); <https://doi.org/10.1063/1.5120175>
- 13) On-surface trapping of alkali atoms by crown ethers in ultra high vacuum, M. Stredansky, E. Turco, Z. Feng, R. Costantini, G. Comelli, A. Verdini, L. Floreano, A. Morgante, Dri, and A. Cossaro, *Nanoscale Adv.*, 2019, 1, 1721-1725
- 14) ANCHOR-SUNDYN: a novel endstation for time resolved spectroscopy at the ALOISA beamline, R. Costantini, M. Stredansky, D. Cvetko, G. Kladnik, A. Verdini, P. Sigalotti, F. Cilento, F. Salvador, A. De Luisa, D. Benedetti, L. Floreano, A. Morgante, A. Cossaro, M. Dell'Angela, *Journal of Electron Spectroscopy and Related Phenomena* 229 (2018) 7–12
- 15) On-surface synthesis of a 2D boroxine framework: a route to a novel 2D material?, M. Stredansky, A. Sala, T. Fontanot, R. Costantini, C. Africh, G. Comelli, L. Floreano, A. Morgante and A. Cossaro, *Chem. Commun.*, 2018, 54, 3971-3973, DOI: 10.1039/C8CC01372A
- 16) Spectroscopic fingerprints of intermolecular H-bonding interactions in carbon nitride model compounds, V. Lanzilotto, J. L. Silva, T. Zhang, Matus Stredansky, C. Grazioli, K. Simonov, E. Giangrisostomi, R. Ovsyannikov, M. de Simone, M. Coreno, C. M. Araujo, B. Brena and C. Puglia, *Chem. Eur. J.* 10.1002/chem.201802435

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17) Nanoscale Phase Separation and Lattice Complexity in VO₂: The Metal–Insulator Transition Investigated by XANES via Auger Electron Yield at the Vanadium L23-Edge and Resonant Photoemission, A. Marcelli, M. Coreno, M. Stredansky, W. Xu, C. Zou, L. Fan, W. Chu, Sh. Wei, A. Cossaro, A. Ricci, A. Bianconi and A. D’Elia, *Condensed Matter* 2017, 2(4), 38; doi:10.3390/condmat2040038

18) Electronic properties of the boroxine–gold interface: evidence of ultra-fast charge delocalization, D. Toffoli, M. Stredansky, Z. Feng, G. Balducci, S. Furlan, M. Stener, H. Ustunel, D. Cvetko, G. Kladnik, A. Morgante, A. Verdini, C. Dri, G. Comelli, G. Fronzoni and A. Cossaro, *Chem. Sci.*, 2017, 8, 3789–3798, doi: 10.1039/C6SC05632F

19) Multienzyme Amperometric Gluconic Acid Biosensor Based on Nanocomposite Planar Electrodes for Analysis in Musts and Wines, M. Stredansky, J. M. Ochoa Martínez, M. Stredansky, J. Labuda, *Int. J. Electrochem. Sci.*, 12(2017) 1183–1192, doi: 10.20964/2017.02.31

Trieste. 08/06/2023

In fede, Matus Stredansky

