HOSTING GROUPS FOR INTERNATIONAL MOBILITY

Light Lab Group

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The research group, leaded by Prof. Maria Luisa Saladino, use sustainable procedures for the developing of innovative materials and their characterisation by using Spectroscopic Techniques.

Current research focuses on multifunctional nanomaterials, nanocomposites, colloidal dispersions and hybrids, based on luminescent materials, porous silica and hydroxides. The application of materials is devoted mainly to multilevel anti-counterfeiting systems and to the conservation of ancient stone and fresco substrates. Wet methods are used for the synthesis of materials such as coprecipitation, sol-gel and solvothermal methods, also assisted by microwave irradiation. Structural and Morphological properties are investigated trough XRD Diffraction, Electron Microscopy, UV-vis and Infrared Spectroscopy, XRF Spetroscopy.

A part of the activity is devoted to developing sustainable procedures for the investigation of artefacts in the field of Cultural Heritage (mainly paintings and metals) by using non invasive techniques and multianalytical approaches as well as machine learning methods.

Part of our research is performed through national and international collaborations, involving both academic and industrial partners as well as Museum and Archaeological Parks. Main collaborations:

- Prof. Dr. Dariusz Hreniak, Institute of Low Temperature and Structure Research Polish Academy of Sciences, Wrocław, Poland.
- Prof. Dr. Eugeniusz Zych and Prof. Łydżba-Kopczyńska, Faculty of Chemistry, University of Wrocław, Wrocław, Poland.
- Prof. Dr. Cristina Giordano, Queen Mary University of London, School of Physical and Chemical Sciences, London UK.
- Dr. Rosina Celeste Ponterio, CNR - Institute for Chemical-Physical Processes-Messina, Italy
- Prof. Dr. Ramūnas Skaudžius, faculty of chemistry and Geosciences, University of Vilnius, Lituania

Foto Gruppo

Team members:

Nome/i e Cognome/i Ricercatore/i

Prof.ssa Maria Luisa Saladino, Associate Prof. in Physical Chemistry, https://www.unipa.it/persone/docenti/s/marialuisa.saladino

Dr. Francesco Armetta, Researcher in Physical Chemistry, https://www.unipa.it/persone/docenti/a/francesco.armetta01

Ms. Chiara Tuccio, PhD. Student in Cultural Heritage, 38° cycle

Ms. Federica Palumbo, PhD. Student in Cultural Heritage, 40° cycle

Selected publications:

- F. Armetta, M.L. Saladino, A. Scherillo, E. Caponetti, “Microstructure and phase composition of bronze Montefortino helmets discovered Mediterranean seabed to explain an unusual corrosion”, Scientific Reports 11, 23022 (2021). https://doi.org/10.1038/s41598-021-02425-6
- F. Armetta, M.L. Saladino, M. C. Martinelli, R. Vilardo, G. Anastasio, S. Trusso, V. Mollica Nardo, D. Giuffrida, R.C. Ponterio, „Improved chemometric approach for XRF data treatment. The case of reverse glass paintings from Lipari collection” RSC Advances, 13 (2023) 4495 – 4503. https://doi.org/10.1039/D2RA08178D
- E. Paradisi, C. Mortalò, V. Zin, F. Armetta, V. Boiko, D. Hreniak, M. Zapparoli, S.M. Deambrosis, E. Miorin, C. Leonelli , M.L. Saladino, Tuning the morphology and optical properties of Eu-doped YPO4 nanopowders by a rapid microwave-assisted hydrothermal method ACS Applied Nano Materials 7 (2024) 6893−6905. https://doi.org/10.1021/acsanm.3c05806
- F. Armetta, A. Lo Bianco, V. Boiko, D. Hreniak, M. L. Saladino, Multimodal anti-counterfeiting inks: modern use of an ancient pigment in synergy with a persistent phosphor J. of Material Chemistry C, 13, (2025) 1188 - 1197, DOI: 10.1039/D4TC04228J
- F. Armetta, M. Baublytė; M. Lucia; D. Giuffrida; R. C. Ponterio; M. L. Saladino; S. Orecchio, Chemistry of Street Art: Neural Network for the Spectral Analysis of Berlin Wall Colors, Journal of the American Chemical Society 146, (2024) 35321−35328 https://doi.org/10.1021/jacs.4c12611