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Profile

Francesca Sabatini, graduated in Chemistry, achieved her Ph.D. in Chemistry and Material Science in 2019 at University of Pisa. She worked as post-doctoral researcher for two years at University of Pisa and for one year and a half at CNR-SCITEC of Perugia. She mostly experienced in Analytical Chemistry applied to Cultural Heritage and her knowledge is focused on the application of HPLC-DAD-FD-MS, GC-MS, Py-GC-MS and EGA-MS techniques for the analysis of organic materials such as natural and synthetic organic pigments, binders and natural and man-made fibers in ancient and contemporary artworks. She also took part to several national and international diagnostic campaigns for the analysis of works of art making use of portable and non-invasive spectroscopic techniques such as external-reflectance FT-IR spectroscopy, FORS, Raman spectroscopy and hyperspectral imaging techniques in the MID-IR and Vis range. Francesca Sabatini authored more than 30 research articles on several international journals, and she delivered more than 15 oral communications at national and international scientific conferences.

Professional experiences

- **Researcher (RTDa)** at **University of Milano-Bicocca**, Department of Earth and Environmental Sciences (DISAT), 01/05/2023-present. Project: "Identification and determination of bioactive molecules by HPLC-MS/MS".
- **Research grant** on "Optimization of the portable technique of hyperspectral imaging in the medium infrared" at Institute of Chemical Sciences and Technologies "G. Natta" **CNR-SCITEC**, Perugia, 01/10/2021-30/04/2023.
- **Employment** at **J. Heyrovský Institute of Physical Chemistry of the CAS**, Prague, 09/09/2021-17/09/2021.
- **Fellowship grant** on "Support for the preparation of metal-free leather" at **University of Pisa**, Department of Chemistry and Industrial Chemistry in collaboration with Conceria Zabri s.p.a., 01/07/2021- 01/09/2021
- **Research grant** on "Study of the degradation of natural organic dyes on polymeric supports" at **University of Pisa**, Department of Chemistry and Industrial Chemistry, 20/05/2020- 20/05/2021.
- **Fellowship grant** on "Development and application of analytical procedures for the studying of synthetic organic pigments in modern and contemporary art" at **University of Pisa**, Department of Chemistry and Industrial Chemistry, 20/11/2018-19/05/2020.

Education

- **Ph.D. in Chemistry and Material Science** at University of Pisa, 02/11/2015-07/03/2019. Thesis title: "Ageing and fading of organic pigments in art: a multi-analytical study based on mass spectrometric techniques".
- **Master degree** at University of Pisa, Department of **Chemistry and Industrial Chemistry**, **110/110 cum laude**, 01/01/2013-19/12/2014. Thesis title: "HPLC-DAD-MS and MALDI strategies for anthraquinoid lakes identification in paint samples".
- **Bachelor degree** at University of Pisa, Department of **Chemistry and Industrial Chemistry**, **110/110**, 01/10/2009-22/12/2012. Thesis title: "Characterization of organic materials used in wall painting of the *Beiwusheng Huiguan*, (Shaanxi, Cina) using a multi-analytical approach" (thesis written in Italian).
- **Scientific high school diploma** at Ulisse Dini of Pisa, 97/100.

Abroad experience

- **Visiting Ph.D. student at Faculty of science, Van 't Hoff Institute for Molecular Sciences, University of Amsterdam (UvA)**, Amsterdam, 16/04/2018-20/07/2018. Project: investigation of synthetic organic pigments degradation by UHPLC-DAD-MS.
- **Responsible experimentalist at HZB (Helmholtz-Zentrum Berlin) synchrotron**, Berlin 29/01/2018-4/02/2018. Project: investigation of eosin degradation by SR-FT-IR spectroscopy (IRIS beamline/BESSY station).
- **Visiting Ph.D. student at IPANEMA (Ancient Materials Research Platform) at the SOLEIL**, Paris, 11/12/2017-16/12/2017. Project: investigation of eosin degradation using luminescence microscopy, fluorescence spectroscopy and μ -FT-IR techniques.
- **Visiting Ph.D. student at J. Heyrovský Institute of Physical Chemistry of the CAS**, Prague, 19/04/2017-27/04/2017. Project: investigation of the degradation of eosin using cyclic voltammetry and exhaustive hydrolysis.
- **Post-graduated traineeship at HERCULES (Heranca Cultural, Estudos e Salvaguarda)**, Evora, 16/03/2015-19/06/2015. Project: characterization of inorganic and organic materials contained in Gregorio Lopes' painted altarpieces (1520; Lisbon) using μ -FT-IR and μ -Raman Spectroscopy, SEM-EDS and Py-GC/MS.
- **Erasmus Placement at the ICT (Department of Biochemistry and Microbiology of Chemical Technologies Institute)**, Prague, 05/05/2014-05/08/2014. Project: characterization of proteinaceous binders and anthraquinoid lakes using MALDI-ToF-MS and LDI-ToF-MS.

Teaching experience

- **Contract of temporary collaboration for teaching assistance** for the course of Laboratory of Analytical Chemistry III, Analytical Chemistry II, Analytical Chemistry I at University of Pisa, Department of Chemistry and Industrial Chemistry (2015/2016, 2016/2017, 2017/2018, 2018/2019, 2020/2021).
- **Supervising of bachelor and master students** in their traineeship activities at University of Pisa, Department of Chemistry and Industrial Chemistry (2015-2021)

Original papers and chapters (indexed in Scopus and WOS; * corresponding author)

1. E. Della Latta, F. Sabatini, C. Micheletti, M. Carlotti, F. Martini*, F. Nardelli, A. Battisti, I. Degano, M. Geppi, A. Pucci*, S. Pohld, G. Kickelbick (2023). *Performant flexible luminescent solar concentrators of phenylpolysiloxanes crosslinked with perylene bisimide fluorophores*, **Polymer Chemistry**, 14, 1602-1612, doi: 10.1039/d2py01428a.
2. I. Bargagli, F. Sabatini*, F. Modugno, J.J. Łucejko* (2022). *Testing Clean-Up Methods for the Quantification of Monosaccharides and Uronic Acids*, **Applied Science**, 12(24), 12781, doi: 10.3390/app122412781.
3. A. Ferretti, F. Sabatini, I. Degano* (2022). *A Model Iron Gall Ink: An In-Depth Study of Ageing Processes Involving Gallic Acid*, **Molecules**, 27, 8603, doi: 10.3390/molecules27238603.
4. F. Sabatini, I. Corsi, A. Ceccarini, M. Brillanti, M.P. Colombini, I. Bonaduce* (2023). *Pyrolysis gas chromatography mass spectrometry: A promising tool for disclosing metal-free tanning agents used in leather industry*, **Journal of Analytical and Applied Pyrolysis**, 169, 105803, doi: 10.1016/j.jaap.2022.105803.
5. F. Sabatini, I. Degano (2022). *Analysis of natural and synthetic organic lakes and pigments by chromatographic and mass spectrometric techniques*, in: **Analytical Chemistry for the Study of Paintings and the Detection of Forgeries**, M.P. Colombini, I. Degano, A. Nevin (eds), Springer Cham, 247-288, doi: 10.1007/978-3-030-86865-9_9.
6. F. Sabatini*, J. Alcantara-Garcia, I. Degano (2022). *Molecular Characterization of a South American Yellow Dye Source: Cosmos Sulphureus*, **ChemistrySelect**, 7, e202200720, doi: 10.1002/slct.202200720.

7. T. Nacci, F. Sabatini, C. Cirrincione, I. Degano*, M.P. Colombini (2022). *Characterization of textile fibers by means of EGA-MS and Py-GC/MS*, **Journal of Analytical and Applied Pyrolysis**, 165, 105570, doi: 10.1016/j.jaap.2022.105570, doi: 10.1016/j.jaap.2022.105570.
8. T. Nacci*, D. Roversi, F. Sabatini, I. Degano, B. Ferriani, N. Strada, F. Modugno (2022). *Multianalytical approach to characterize composition and degradation processes of synthetic high-fashion textiles from the Nanni Strada Design Studio archives*, **Journal of Physics: Conference Series**, IOP Publishing, 2204 (1), doi: 10.1088/1742-6596/2204/1/012012.
9. R. Deyjoo, P. Holakooei*, F. Sabatini, I. Degano, M.P. Colombini (2021). *Coptic textiles in Tehran: dye and fibre characterisation in four Coptic textiles preserved at the Moghadam Museum*, **Archaeological and Anthropological Sciences**, 13, 222 doi: 10.1007/s12520-021-01465-3.
10. J. La Nasa, B. Doherty*, F. Rosi*, C. Braccini, F. T. H. Broers, I. Degano, J. M. Matinero, C. Miliani, F. Modugno, F. Sabatini, I. C. A. Sandu, L. Cartechini (2021). *An integrated analytical study of crayons from the original art materials collection of the MUNCH museum in Oslo*, **Scientific Reports**, 11, 7152, doi: 10.1038/s41598-021-86031-6.
11. F. Sabatini, J. La Nasa, C. Guerrini, F. Modugno, S. Bonadio, F. Ursino, I. Tosini, M.P. Colombini, I. Degano* (2021). *On the Set of Fellini's Movies: Investigating and Preserving Multi-Material Stage Costumes Exploiting Spectroscopic and Mass Spectrometric Techniques*, **Applied Science**, 11(7), 2954, doi: doi.org/10.3390/app11072954.
12. F. Sabatini*, I. Degano, M. Van Bommel (2021). *Investigating the in-solution photo-degradation pathway of Diamond Green G by chromatography and mass spectrometry*, **Coloration Technology**, 137 (5), 456-467, doi: 10.1111/cote.12538.
13. J. La Nasa*, B. Campanella, F. Sabatini, A. Rava, W. Shank, P. Lucero-Gomez, D. De Luca, S. Legnaioli, V. Palleschi, M.P. Colombini, I. Degano, F. Modugno (2021). *60 years of street art: a comparative study of the artists' materials through spectroscopic and mass spectrometric approaches*, **Journal of Cultural Heritage**, 48, 129-140, doi: 10.1016/j.culher.2020.11.016.
14. F. Sabatini, M. Bacigalupo, I. Degano*, A. Javér, M. Hacke (2020). *Revealing the organic dye and mordant composition of Paracas textiles by a combined analytical approach*, **Heritage Science**, 8 (1).
15. P. Grinder-Hansen, U. Kjær, M. Ryhl-Svendsen, M.P. Colombini, I. Degano, J. La Nasa*, F. Sabatini, J. van der Plicht, K. Lund Rasmussen (2020). *Textiles and environment in the showcase containing Saint Canute the Holy († AD 1086): Radiocarbon dating and chemical interactions*, **Heritage Science**, 8 (1), doi: 10.1186/s40494-020-00442-8.
16. A. Chieli, C. Miliani, I. Degano, F. Sabatini, P. Tognotti, A. Romani* (2020). *NEW insights into the fading mechanism of Geranium Lake in painting matrix*, **Dyes and Pigments**, 181, 108600, doi: 10.1016/j.dyepig.2020.108600.
17. F. Sabatini, E. Eis, I. Degano, M. Thoury, I. Bonaduce, A. Lluveras-Tenorio* (2020). *The issue of eosin fading: A combined spectroscopic and mass spectrometric approach applied to historical lakes*, **Dyes and Pigments**, 160, 587-596, doi: 10.1016/j.dyepig.2020.108436.
18. F. Sabatini, A. Manariti, F. di Girolamo, I. Bonaduce, L. Tozzi, A. Rava, M.P. Colombini, A. Lluveras-Tenorio* (2020). *Painting on polyurethane foam: "Composizione-Superficie Lunare" by Giulio Turcato*, **Microchemical Journal**, 156, 104872, doi: 10.1016/j.microc.2020.104872.
19. F. Sabatini*, I. Degano (2020). *Investigating the fragmentation pathways of β -naphthol pigments using liquid chromatography/electrospray ionization quadrupole time-of-flight mass spectrometry*, **Rapid Communication in Mass Spectrometry**, 34:e8789, doi: 10.1002/rcm.8789.
20. F. Sabatini*, I. Degano, M.P. Colombini (2020). *Development of a method based on high performance-liquid chromatography coupled with diode array, fluorescence, and mass spectrometric detectors for the analysis of eosin at trace levels*, **Separation Science plus**, 1-9, doi: 10.1002/sscp.202000002.

21. K. Kato, B. Doherty*, I. Degano, F. Sabatini, C. Miliani, A. Romani, K. Ito, B.G. Brunetti (2020). *An SERS analytical protocol for characterizing native Japanese plant extracts*, **Journal of Raman Spectroscopy**, 1-11, doi: 10.1002/sscp.202000002.
22. J. La Nasa, L. Nodari*, F. Nardella, F. Sabatini, I. Degano, F. Modugno, S. Legnaioli, B. Campanella, M.K. Tufano, M. Zuenza, P. Tomasin (2020). *Chemistry of Modern Paint Media: the Strained and Collapsed Painting by Alexis Harding*, **Microchemical Journal**, 155, 104659, doi: 10.1016/j.microc.2020.104659.
23. P. Holakooei*, A.H. Karimy, F. Saeidi-Anaraki, C. Vaccaro, F. Sabatini, I. Degano, M.P. Colombini (2020). *Colourants on the wall paintings of a mediaeval fortress at the mount Sofeh in Isfahan, central Iran*, **Archaeological Science Report**, 29, 102065, , doi: 10.1016/j.jasrep.2019.102065.
24. I. Degano, M. Mattonai, F. Sabatini, M.P. Colombini (2019). *A mass spectrometric study on tannin degradation within dyed woolen yarns*, **Molecules**, 24(12), 2318, doi: 10.3390/molecules24122318.
25. J. La Nasa, G. Biale, F. Sabatini, I. Degano, M.P. Colombini, F. Modugno* (2019). *Synthetic materials in art: a new comprehensive approach for the characterization of multi-material artworks by analytical pyrolysis*, **Heritage Science**, 7(1), 8, doi: 10.1186/s40494-019-0251-4.
26. I. Degano*, F. Sabatini, C. Braccini, M.P. Colombini (2019). *Triarylmethine dyes: Characterization of isomers using integrated mass spectrometry*, **Dyes and Pigments**, 160, 587-596, doi: 10.1016/j.dyepig.2018.08.046.
27. F. Sabatini, T. Nacci, I. Degano*, M.P. Colombini (2018). *Investigating the composition and degradation of wool through EGA/MS and Py-GC/MS*, **Journal of Analytical and Applied Pyrolysis**, 135, 111–121, doi: 10.1016/j.jaap.2018.09.012.
28. F. Sabatini, R. Giugliano, I. Degano* (2018). *Photo-oxidation processes of Rhodamine B: A chromatographic and mass spectrometric approach*, **Microchemical Journal**, 140, 114-122, doi: 10.1016/j.microc.2018.04.018.
29. F. Sabatini, R. Giugliano, I. Degano, A. Lluveras-Tenorio, R. Sokolová, M. Thoury, M.P. Colombini (2018). *Development of a multi-analytical approach to investigate the fading of eosin in painting matrices*, **IOP Conference Series: Materials Science and Engineering**, 364 (1) 012066, doi: 10.1088/1757-899X/364/1/012066.
30. F. Sabatini, A. Lluveras-Tenorio, I. Degano*, S. Kuckova, I. Krizova, M. P. Colombini (2016). *A Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry Method for the Identification of Anthraquinones: the case of Historical Lakes*, **Journal of The American Society for Mass Spectrometry**, 27 (11), 1824-1834, doi: 10.1007/s13361-016-1471-4.
31. A. Lluveras-Tenorio*, I. Bonaduce, F. Sabatini, I. Degano, C. Blaensdorf, E. Pouyet, M. Cotte, M. P. Colombini (2015). *The Organic Materials used in the Five Northern Provinces' Assembly Hall Mural Paintings (Ziyang, China): disclosing the painting technique of the Qing Dynasty Painters in Civil Buildings*, **Applied Physics A**, 121(3), 879-889, doi: 10.1007/s00339-015-9362-2.

Other publications

1. F. Sabatini, E. Eis, F. Magini, I. Degano, T. Rickert (2023), *Bright Orange and Scarlet Red: Disclosing the Composition and Degradation Mechanisms of 'Combined Lake' Formulations*, in: **Dyes in History and Archeology 37/40**, J. Kirby (ed), Archetype Publications, 251-261.
2. T. Radelet, L. Spanò, G. Bovenzi, G. Lanterna, O. Cuzman, I. Degano, F. Sabatini, D. Ciofini, S. Siano, scientific investigation in *Onori d'Italia*, in: **Restituzioni. Tesori d'arte restaurati 2022**, Edizioni Gallerie d'Italia | Skira, 306-311.
3. P. Carnazza, S. Francone, N. Sangiorgi, J. La Nasa, F. Sabatini, F. Modugno (2021). *La materia come immagine: artisti a Roma negli anni '60. Intervento di restauro sul tessuto di poliestere in Half dollar di Franco Angeli e caratterizzazione dei materiali costitutivi*, **Kermes**, 118, 59-64.

4. S. Baroni, M.E.M. Forni, M. Gironda, M.A. Lazzari, A. Lluveras Tenorio, M.P. Riccardi, F. Sabatini. *Problemi e soluzioni nel percorso tecnico-pittorico di Virgilio Ripari*, Conference proceedings **Tecnica della pittura in Italia fra Ottocento e Novecento**, Venezia, Fortuny Museum, 23rd March 2019.
5. G. Petta, L. Nucci, I. Degano, F. Sabatini (2017). *Il Delphos in tessuto plissettato di Mariano Fortuny. Restauro e studi per l'attribuzione dell'esemplare conservato al Museo di Mirto*, **Kermes**, 106, 13-19.

Oral presentations

1. F. Sabatini, I. Degano, J. La Nasa, I. Bargagli, C. Duce, L. Cartechini, B. Doherty, F. Modugno, F. Rosi. *A thermal analytical study on LEGO® bricks for investigating properties and light-stability of ABS*, **The Plastic Heritage Congress 2022**, Naples, 17/10/2022-19/10/2022.
2. F. Sabatini, B. Doherty, M. Mattonai, I. Degano, B. Brunetti. *Unveiling the composition of native Japanese dye plants by a combined analytical protocol*, **Dyes in History and Archeology (DHA) 41**, Visby, 11-13/10/2022.
3. F. Sabatini, I. Bargagli, I. Degano, J. La Nasa, L. Cartechini, B. Doherty, F. Modugno, M.P. Colombini, F. Rosi. *The era of plastic: from micro-destructive to non invasive approaches for a more sustainable preservation of plastic artworks*, **Convegno Tematico AIAR La Sostenibilità nei Beni Culturali**, Padua, 29/06/2022-01/07/2022.
4. F. Sabatini, E. Eis, F. Magini, I. Degano, T. Rickert. *Bright orange and scarlet red – disclosing the composition and degradation mechanisms of “combined lake” formulations*, **Dyes in History and Archeology (DHA) 40**, London (online), 15-19/11/2021.
5. F. Sabatini, R. Sokolova, I. Degano. *Looking into the photo-stability of eosin by electrochemical methods*, **Modern Electrochemical Methods XL**, Jetřichovice, 8-12/11/2021.
6. F. Sabatini, J. La Nasa, C. Guerrini, I. Tosini, S. Bonadio, F. Ursino, M. Cimò, L. Triolo, I. Degano. *On the set of Fellini's movies: investigating and preserving multimaterial stage costumes*, **Dyes in History and Archeology (DHA) 38**, Amsterdam, 6-8/11/2019.
7. F. Sabatini, E. Eis, I. Degano, M. Thoury, A. Lluveras Tenorio. *The issue of eosin fading: a combined spectroscopic and mass spectrometric approach applied to historical lakes*, **International Symposium on Dyes & Pigments**, Seville, 8-11/09/2019.
8. F. Sabatini, J. La Nasa, G. Biale, I. Degano, F. Modugno. *Synthetic materials in art: a new comprehensive approach for the characterization of multi-material artworks by analytical pyrolysis*, **XL National Congress on calorimetry, Thermal Analysis and Applied Thermodynamics (AICAT/GICAT 2018)**, Pisa, 17-19/12/2018.
9. F. Sabatini, C. Braccini, M. van Bommel, I. Degano. *Photodegradation of triarylmethine and β -naphthol dyes in different matrices*, **Dyes in History and Archeology (DHA) 37**, Lisbon, 25-26/10/2018.
10. F. Sabatini, C. Braccini, A. Quye, I. Degano, M.P. Colombini. *Characterization of isobaric species and photo-degradation products of triarylmethane dyes within textiles*, **International Mass Spectrometry Conference 2018 (IMSC)**, Florence, 26-31/08/2018.
11. F. Sabatini, I. Degano, A. Lluveras Tenorio. *Ageing and fading of organic pigments in art: a multi-analytical study based on mass spectrometric techniques*, **Chemistry For the Future (CFF)**, Pisa, 04-06/07/2018.
12. F. Sabatini, R. Giugliano, R. Sokolová, I. Degano, M.P. Colombini, *Investigating the degradation pathway of xanthene dyes in textiles*, **Dyes in History and Archeology (DHA) 36**, London, 26-28/10/2017.
13. F. Sabatini, R. Giugliano, I. Degano, M.P. Colombini, *Xanthene dyes: a study on fragmentation patterns and degradation pathways in textiles*, **8th Mass Spectrometry and Chromatography (MaSC)**, Evora, 28-29/09/2017.
14. F. Sabatini, P. Tognotti, C. Anselmi, A. Cheli, C. Miliani, I. Degano. *Eosina: studio della degradazione di un pigmento storico di notevole importanza in campo artistico*, **XVI Congresso Nazionale di Chimica dell'Ambiente e dei Beni Culturali della SCI**, Lecce, 26-29/07/16.

15.F. Sabatini, P. Tognotti, A. Lluveras Tenorio, I. Degano. *Ageing and fading of eosin, a remarkable pigment in XIX-XX century paintings*, **Dyes in History and Archeology (DHA) 35**, Pisa, 05-08/10/2016.

Diagnostic campaigns attended

1. Project PERUGINO: study of the original and conservation materials used in “Martirio di San Sebastiano” (c.a 1500 A.D) easel painting from Perugino by Mid-IR hyperspectral imaging and MA-XRF coupled with Vis-NIR spectroscopy; **MOLAB access**; Museo del Capitolo, Perugia (IT), 3-5/04/2023.
2. Project HFTV-ReVis: characterization of the palette used in the Hunt Frieze of king Philip II tomb by UV-Vis hyperspectral imaging and reflectance UV-Vis-IR spectroscopy; **IPERION-HS**; Museum of the Royal Tombs at Aegae, Vergina (GK), 17-22/03/2023.
3. Project GAPAMET_VE: characterization of the Gates of Paradise, 11th-12th century bronze doors, by SWIR hyperspectral imaging and Raman spectroscopy; **E-RIHS.it**; Basilica di San Marco, Venezia (IT), 27/02/2023-03/03/2023.
4. Project KARpido: characterization and analysis of Plastic Industrial Design Objects of Kartell Museum collection by reflectance UV-Vis-IR and Raman spectroscopy and high-resolution microscopy; **E-RIHS.it**; Museo Kartell, Milan (IT), 21-25/11/2022.
5. Project TexMex: characterization of the materials of feathered Mexican textile by Raman and total reflectance IR spectroscopy; **E-RIHS.it**; Museo delle Civiltà (MuCiv), Roma (IT), 3/10/2022.
6. Project SUPERSTAR: characterization of the materials and conservation state of street-art artworks “Necesse” and “Or.Me” by punctual and hyperspectral-mapping spectroscopic techniques; **MOLAB access**; Milan (IT), 5-6/09/2022, 2-3/11/2021.
7. Project Greek Schools: characterization of Herculaneum papyri by SWIR hyperspectral imaging and total reflectance IR spectroscopy; **MOLAB access**; Biblioteca Nazionale di Napoli Vittorio Emanuele II, Napoli (IT), 12-15/07/2022, 2-3/11/2021.
8. Project BelMod: material technical study on James Ensor and Paul Delvaux artworks by Raman, total reflectance IR, and fluorescence spectroscopy and UV-Vis hyperspectral imaging; **IPERION-HS**; The Royal Museum of Fine Arts Antwerp (KMSKA), Antwerp (BE), 16-20/05/2022.
9. Project MeMoMUCIV: analysis of Mesoamerican Mosaics from the collection of Museo delle Civiltà, by SWIR hyperspectral imaging and Raman spectroscopy; **E-RIHS.it**; Museo delle Civiltà (MuCiv), Roma (IT), 3-5/05/2022.
10. Project: VENERE: analysis of “Venere” painting by Sandro Botticelli (1485-1490) using Vis hyperspectral imaging and total reflectance IR spectroscopy, **E-RIHS.it**; Musei Reali, Turin (IT), 28-31/03/2022.
11. Project CAPPELLA BRANCACCI: characterization of Masolino, Masaccio and Lippi mural paintings by hyperspectral imaging (Vis, SWIR and Mid-IR); **MOLAB access**; Cappella Brancacci-Santa Maria del Carmine, Florence (IT), 8-10, 15-16/03/2022.
12. Project: GRANJA: historical evaluation of high-quality glass pieces of 19th century from the Spanish royal glass factory by Raman and total reflectance IR and Vis spectroscopy; **IPERION-HS**, Real Fábrica de Cristales de San Ildefonso, Real Sitio de San Ildefonso (ES), 7-11/02/2022.
13. Project: GEMMAE: study of structure and composition of Roman glass-gems (2nd century b.C-2nd century AD) by Raman and IR reflectance spectroscopy; **E-RIHS.it**; National Archaeological Museum of Aquileia, Aquileia (IT), 10-14/01/2022.

Prizes and awards

- **Winner of the scholarship** for the participation at **XXVIII Congresso della Divisione di Chimica Analitica della SCI**, Bari, 22-26/09/2019.

- **Winner of the scholarship** for the participation at **International Mass Spectrometry Conference 2018 (IMSC)**, Florence, 26-31/08/2018.
- **Winner of the scholarship** for the participation at **XVI Congresso Nazionale di Chimica dell'Ambiente e dei Beni Culturali della SCI**, Lecce, 26-29/07/16.

Membership

- Member of AIAr (Associazione Italiana di Archeometri) 2022/2023;
- Member of SCI (Società Chimica Italiana) 2015/2019.