

Bio

Early career scientist with experience in geophysical modeling of planetary interiors and in the analysis and the interpretation of radio science data. Currently affiliated with the Europa Clipper Gravity/Radio Science team, working on combining observations from multiple Europa Clipper instruments to constrain Europa's interior structure.

Professional Experience

Mar 2024 – **Postdoctoral Researcher**

Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA - USA

Jan 2023 – **Postdoctoral Researcher**

Feb 2024 *Sapienza Università di Roma, Rome - Italy*

○ Research topics: Icy Moons' Interior Structure, Analysis of Radio Science Data

Education

2019 – 2022 **Ph.D., Space and Aeronautical Engineering**

*Sapienza Università di Roma, Rome - Italy, Final Mark: **with honors***

○ **Thesis:** “Characterization of Planetary Atmospheres and Interior Structures with Radio Science Data”, Advisor: prof. Antonio Genova

○ Research interests: Radio Science, Geophysics and Planetary Interiors, Atmospheric Radio Occultations, Spacecraft Navigation, Mission Formulation

2017 – 2019 **Master's Degree, Space and Aeronautical Engineering**, Sapienza Università di Roma, Rome - Italy, Final Mark: **110/110 with honors**

2014 – 2017 **Bachelor's Degree, Aerospace Engineering**, Sapienza Università di Roma, Rome - Italy, Final Mark: **110/110 with honors**

Publications

- 2024 Genova, A., **Petricca, F.**, et al., Water Ice Concentration and Distribution in the Martian South Polar Layered Deposits Constrained by the Lateral Variations of Their Bulk Density, *Icarus*, vol. 414
- 2024 Genova, A., Parisi, M., Gargiulo, A. M., **Petricca, F.**, et al, Gravity Investigation to Characterize Enceladus's Ocean and Interior, *The Planetary Science Journal*, vol. 5, 40
- 2024 Gargiulo, A. M., Genova, A., **Petricca, F.**, et al., Joint Determination of Venus Gravity and Atmospheric Density Through EnVision Radio Science Investigation, *Acta Astronautica*, vol. 215
- 2023 **Petricca, F.**, Castillo-Rogez, J. C., Genova, A., Melwani Daswani, M., Styczinski, M. J., Cochrane, C. J., Vance, S. D., Partial Differentiation of Europa Inferred from Galileo Gravity Data, *Nature Astronomy*, *under review*

- 2023 **Petricca, F.**, Genova, A., Castillo-Rogez, J. C., Styczinski, M. J., Cochrane, C. J., Vance, S. D., Characterization of Icy Moon Hydrospheres Through Joint Inversion of Gravity and Magnetic Field Measurements, *Geophysical Research Letters*, vol. 50, 17
- 2023 Sulcanese, D., Mitri, G., Genova, A., **Petricca F.**, et al., Topographical analysis of a candidate subglacial water region in Ultimi Scopuli, Mars, *Icarus*, vol. 392, 115394
- 2023 Genova, A., Goossens, S., Del Vecchio, E., **Petricca F.**, et al., Regional variations of Mercury’s crustal density and porosity from MESSENGER gravity data, *Icarus*, vol. 391, 115332
- 2023 Andolfo, S., **Petricca, F.**, Genova, A., Precise Pose Estimation of the NASA Mars 2020 Perseverance Rover Through a Stereo-vision-based Approach, *Journal of Field Robotics*, vol. 40, 3
- 2022 **Petricca, F.**, Genova, A., Sequential Processing of Inter-Satellite Doppler Tracking for a Dual-Spacecraft Configuration, *Remote Sensing*, vol. 14, 5383
- 2022 **Petricca, F.**, Genova, A., Goossens, S., Iess, L., Spada, G., Constraining the Internal Structures of Venus and Mars from the Gravity Response to Atmospheric Loading, *The Planetary Science Journal*, vol. 3, 164.
- 2021 **Petricca, F.**, Cascioli, G., Genova, A., A Technique for the Analysis of Radio Occultation Data to Retrieve Atmospheric Properties and Associated Uncertainties, *Radio Science*, vol. 56, 5.
- 2021 Genova, A., **Petricca F.**, Deep-Space Navigation with Inter-Satellite Radio Tracking, *Journal of Guidance, Control, and Dynamics*, vol. 44, 5.
- 2020 Cascioli, G., **Petricca F.**, Genova, A., Mars’ atmospheric calibration of radio tracking data for precise orbit determination, *Acta Astronautica*, vol. 177, pag. 103-110.

Awards & Affiliation

- 2021 – Affiliate of the Europa Clipper Science Team, Gravity / Radio Science Investigation
- 2021 – American Geophysical Union Member
- 2021 – European Geosciences Union Member
- 2020 Outstanding Sapienza University Graduate Student of the Year 2019

IT Skills

- Programming Languages: Python, MATLAB, C, Fortran
- Operating Systems: GNU/Linux, Windows, Mac OS
- Software: MONTE Navigation Toolkit (NASA-JPL), NAIF SPICE (NASA-JPL)