

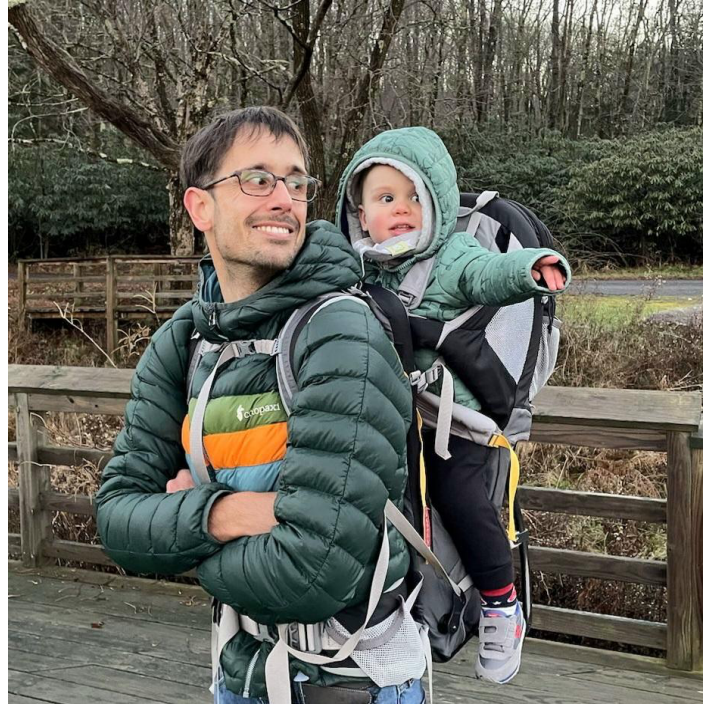
**Name:** Stefano Bertone (he/him)

**Code:** 698

**Home institution:** University of Maryland  
College Park (UMCP)

**Name of task:** Planetary Geodesy, Planetary  
Science

**Role in task / what they do for CRESST:** My research within the Planetary Geology, Geophysics and Geochemistry Laboratory has focused on a wide range of techniques to study Solar System bodies from crust to core. I developed advanced software tools for the analysis of altimetry and imagery collected by planetary probes (mainly LRO and MESSENGER), and to model the illumination and thermal environment of planetary surfaces. I also used them (among others) to improve our understanding of Mercury's internal structure and evolution, and to study the polar regions of Mercury and the Moon. More recently, I have been involved in characterizing selected sites of the Lunar south pole to support ongoing and upcoming Lunar exploration.



**Background / Autobiography?** After getting my B.Sc. in Physics at Turin University (Italy), I moved to France, where I obtained my M.Sc. and Ph.D. in Astronomy and Astrophysics (the latter within a joint French-Italian program) working on relativistic astrometry for the Gaia mission. For my postdoc, I moved to Switzerland and to a new topic: developing planetary geodesy and orbit determination for the GRAIL mission. While in Bern (Switzerland), I also supervised two M.Sc. and two Ph.D. theses (one still ongoing). I got to GSFC and CRESST thanks to a Mobility Fellowship awarded by the Swiss NSF to work on a variety of subjects in planetary science, which gave me the opportunity to learn new skills and to extend my research interests thanks to new collaborations within a very skilled and motivated team.

**Favorite part of being a CRESST Scientist?** Doing research in space science makes every day an exciting adventure full of new discoveries, and CRESST allows me to be part of a very rich and collaborative environment within an impressive team in one of the most important institutions in this field. It also allows me the flexibility to “smoothly package” my activities and interests in a diverse variety of projects into a faculty position within a well-recognized academic institution.

**List of publications, presentations, conferences they have spoken at etc.**

1. Potter, S., **S. Bertone**, E. Mazarico, N. Schorghofer. Precomputed Radiosity for Fast Thermal Modeling on Airless Bodies. In Journal Of Computational Physics X, 17: 100130. doi:10.1016/j.jcp.2023.100130

2. Desprats, W., **S. Bertone**, D. Arnold, A. Jäggi, and M. Blanc. 2023. "Influence of low orbit design and strategies for gravity field recovery of Europa." In *Planetary and Space Science*, 226: 105631. doi:10.1016/j.pss.2022.105631.
3. **Bertone S.**, E. Mazarico, M. K. Barker, M. A. Siegler, J. M. Martinez-Camacho, C. D. Hamill, A. K. Glantzberg, N. L. Chabot Highly Resolved Topography and Illumination at Mercury's South Pole from MESSENGER MDIS NAC. In *Planetary Science Journal*, 4, 2, 02/2023. doi:10.3847/PSJ/acaddb
4. **Bertone S.**, Arnold D., Girardin V., Lasser M., Meyer U., and Jäggi A. Impact of reduced-dynamics approach on orbit and gravity field recovery: application to the GRAIL lunar probes. In *Earth and Space Science*, 05/2021. doi:10.1029/2020EA001454
5. **Bertone S.**, E. Mazarico, M. K. Barker, S. Goossens, G. A. Neumann, T. J. Sabaka, and D. E. Smith. New solution for Mercury geodetic parameters with altimetric crossovers from the Mercury Laser Altimeter (MLA). In the *Journal of Geophys. Res. - Planets*, 126, 4, 04/2021. doi:10.1029/2020JE006683.
6. **Bertone S.**, C. Le Poncin-Lafitte, P. Rosenblatt, V. Lainey, J.-C. Marty, and M.-C. Angonin. Impact analysis of the transponder time delay on radio-tracking observables. In *Advances in Space Research*, 61, 89-96, 01/2018. doi:10.1016/j.asr.2017.09.003
7. Delva, P., and 13 co-authors, incl. **S. Bertone** Gravitational Redshift Test Using Eccentric Galileo Satellites. In *Physical Review Letters*, 121, 231101, 12/2018. doi:10.1103/PhysRevLett.121.231101, arXiv:1812.03711
8. **Bertone S.**, C. Le Poncin-Lafitte, P. Rosenblatt, V. Lainey, J.-C. Marty, and M.-C. Angonin. Impact analysis of the transponder time delay on radio-tracking observables. In *Advances in Space Research*, 61, 89-96, 01/2018. doi:10.1016/j.asr.2017.09.003
9. **Bertone S.**, A. Vecchiato, B. Bucciarelli, M. Crosta, M. G. Lattanzi, L. Bianchi, M.-C. Angonin, and C. Le Poncin-Lafitte. Application of time transfer functions to Gaia's global astrometry. Validation on DPAC simulated Gaia-like observations. In *Astronomy and Astrophysics*, 608, A83, 12/2017. doi:10.1051/0004-6361/201731654, arXiv:1708.00541
10. Arnold, D., **S. Bertone**, A. Jäggi, G. Beutler, and L. Mervart. GRAIL gravity field determination using the Celestial Mechanics Approach. In *Icarus*, 261, 182-192, 11/2015. doi:10.1016/j.icarus.2015.08.015,

#### List of awards won:

- Lancelot M. Berkeley - New York Community Trust Prize (The Gaia Collaboration), 2023.

**Three fun facts:** I speak 4 languages proficiently (+1 well enough for most uses, +1 if we want to count Piedmontese, my regional "dialect"); I took part in the Opening and Closing ceremonies of the Turin 2006 Winter Olympics (you might be able to spot me in the recording, maybe!); at least once I ended up at the wrong airport (but still caught my flight) and on the wrong 4000+ meters Alpine summit (but still had a great time).