

## Getting Ready for New Observations of the Edge of the Solar System by the Interstellar Mapping and Acceleration Probe

With this Master thesis, we invite you to contribute to the NASA space mission IMAP [www.imap.princeton.edu](http://www.imap.princeton.edu), to be launched in summer 2025. IMAP will be studying the boundaries of the heliosphere and the local interstellar cloud. The University of Bern has helped develop two of the particle instruments of IMAP. These Energetic Neutral Atoms (ENA) cameras measure neutral atoms that travel from the interstellar boundary region all the way to the inner solar system. With these observations, we can reveal the structure of the heliosphere and the surrounding local interstellar medium through which our solar system is moving.

The ability to understand the heliosphere depends critically on how well we can calibrate the ENA cameras in our MEFISTO laboratory [www.space.unibe.ch/mefisto](http://www.space.unibe.ch/mefisto) with neutral atom beams. To enable a thorough calibration, we have developed an Absolute Beam Monitor (ABM) [Gasser et al. 2022] to measure the absolute intensity and energy characteristics of the neutral atom beams. The ABM design is well tested and we have assembled a second, improved version, which successfully passed the first test runs in MEFISTO.

Your tasks for the Master thesis will consist of:

- Finalizing the improved version of the ABM with the help of our MEFISTO lab technician.
- Characterizing the ABM against a series of well-known beams of neutral hydrogen, oxygen, and helium.
- Supporting the Calibration Campaigns of the IMAP-Lo instrument in MEFISTO in 2025.
- Further support of the IMAP mission and science, depending on the schedule of the IMAP mission

For further information, please contact:

Prof. Peter Wurz, [peter.wurz@unibe.ch](mailto:peter.wurz@unibe.ch)

Dr. André Galli, [andre.galli@unibe.ch](mailto:andre.galli@unibe.ch)

Universität Bern  
Physikalisches Institut  
**Weltraumforschung und Planetologie**  
Sidlerstrasse 5  
CH-3012 Bern  
[www.space.unibe.ch](http://www.space.unibe.ch)

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