UNIVERSITÄT BERN

Astronomisches Institut, Sidlerstrasse 5, CH - 3012 Bern

Bern, September 7, 2023

Philosophisch-naturwissenschaftliche Fakultät

**Astronomisches Institut**

The **Space Weather and Satellite Geodesy groups of the Astronomical Institute of the University of Bern (AIUB)** are inviting applications for a

# PhD student

to work on

## determining the influence of space weather on satellite orbits

The University of Bern hosts many domains of astronomy, from solar physics, to exoplanets, and satellite observations. The successful candidate will work jointly in the space weather and satellite geodesy groups, which focus on understanding solar flares with machine learning and on precise orbit determination of satellites using data from Global Navigation Satellite Systems (GNSS). This project is funded via a Swiss National Science Foundation (SNSF) PRIMA grant and has the goal of investigating space weather effects on the density of the Earth's atmosphere and thus also on Low Earth Orbiting satellite orbits.

Space weather is the consequence of solar storms. Such storms release immense amounts of energy, both via particles and via radiation. Increased solar UV radiation heats the Earth's atmosphere, which in turn causes it to expand and thus its density at higher altitudes increases. This leads to increased drag on satellites whose orbits are affected and decay in altitude. However, space weather currently cannot be reliably predicted and the exact influence of solar storms on satellite orbits is not well known. The goal of this PhD project is to characterize effects of solar storm on satellite orbits and to better understand the density changes in the Earth's atmosphere.

The PhD student will learn about space weather, orbit determination methods, Earth's atmosphere models, data analysis including parameter estimation and machine learning, and programming. The length of a PhD is typically 3-4 years. Support for conferences and collaborations is available.

**Requirements:**

- We are looking for highly motivated candidates with (or obtaining soon) a MSc in physics, astronomy, geodesy, mathematics, or a related topic.
- A background in either astronomical or GNSS data analysis is desired.
- Knowledge of programming in Python, Fortran90 and/or C++ would be beneficial.
- At least a basic knowledge of astronomy is required.
- Strong verbal and written communication skills in English.
- Strong analytical abilities and problem solving/troubleshooting skills.
- Teamplayer who likes to work with other group members and students.

**Appointment:** As soon as possible, open until filled. Funding for maximally 4 years.

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**Application:** deadline: **October 20, 2023**, via email to L. Kleint, containing (**as one pdf file**):

- CV
- motivation letter **for this specific PhD position**
- a copy of BSc and MSc transcripts of courses and grades (scans of official transcripts are sufficient)
- if available, a pdf of or link to the Master's thesis (if emailed, please < 5 MB).
- Two letters of recommendation shall be sent before the application deadline directly **by the referees** to L. Kleint.

Incomplete applications, applications with missing reference letters, or applications written by ChatGPT unfortunately cannot be considered.

**Salary:** Based on the regulations of the University of Bern, starting at 47 kCHF/year

**Contact:** Prof. Dr. Lucia Kleint (email lucia.kleint@unibe.ch) or Prof. Dr. Adrian Jäggi (email adrian.jaeggi@unibe.ch).

An equal opportunity environment is important to us, and we welcome applicants from groups that are traditionally underrepresented in physics and astronomy. We will be particularly pleased to receive applications from women for the advertised position.