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**UNIVERSITÄT  
BERN**

Astronomisches Institut, Sidlerstrasse 5, CH-3012 Bern

Philosophisch-  
naturwissenschaftliche Fakultät

**Astronomisches Institut**

Bern, 26. August 2019

## **Open Position at the Astronomical Institute of the University of Bern**

The group “Satellite Geodesy” of the Astronomical Institute of the University of Bern (AIUB) offers the position for a

### **Ph.D. Candidate**

The focus will be on planetary geodesy, in particular on the orbit determination of deep space probes around other celestial bodies and the recovery of geodetic parameters like gravity field, tidal, or rotation parameters from tracking data of these probes.

Special focus will be given to the Jovian moon Callisto, the outermost of the four Galilean moons. Callisto appears to be the least differentiated of the regular Jupiter satellites and, as such, seems to keep the best record of its formation and of the early ages of the Jupiter system. Measurements performed by the NASA spacecraft Galileo suggest that Callisto owns, like Europa and Ganymede, a subsurface ocean of liquid salt water and could, therefore, also be interesting in view of habitability.

The National Space Science Center (NSSC), Chinese Academy of Sciences (CAS), is in the very early planning stages of a future Chinese space mission to the Jovian system. After an extensive Jupiter orbital tour it is foreseen to enter into an orbit around Callisto to investigate the internal structure, as well as the exosphere of Callisto.

The Ph.D. position will be on a simulation study to be conducted in order to find orbit scenarios for a Callisto orbiter which are optimal for the determination of specific geodetic parameters. Realistic spacecraft tracking data, as well as altimetry measurement are to be simulated and used for the orbit and geodetic parameter determination in a closed-loop simulation. The data simulation, as well as parameter determination will be conducted in the development version of the Bernese GNSS Software, which has been recently extended by capabilities to process Doppler data from deep space probes.

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One part of the project is also to design extended Jupiter tour trajectories and to analyze their compatibility with the low Callisto orbits. For this part, the Ph.D. candidate is expected to work for approximately 9 months at NSSC in Beijing and to collaborate with the local experts in trajectory design and optimization.

**Education:**

The candidate is expected to have successfully completed the master thesis (diploma/“Lizentiat”/Master) in astronomy, geodesy, physics, or a related topic. Experience in gravity field determination from satellite data is an advantage. Background in computer science (coding in Fortran90, C++, or Perl) is not a requirement, but beneficial for working in this project. The candidate should speak and write English fluently.

The candidate should start working in Bern on November 4, 2019. The position is scheduled for four years. The salary follows the guidelines of the University of Bern.

**Application:**

Applications (including CV, university diploma copies, possible references) should be received as soon as possible but no later than September 30, 2019 at the following address:

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Informal information may be obtained at the above address as well.

The University of Bern is an equal opportunity employer and encourages in particular women to apply for open positions.