

## Callisto geodesy

Callisto is the outermost of the four Galilean moons of Jupiter and a very interesting celestial body to study the origin of the Jovian and solar system. Compared to the other Galilean moons - Io, Europa and Ganymede - Callisto's interior is much less heated by tidal deformations and it therefore remained in a relatively primordial state. The moon shows a very old and heavily cratered surface. There is also the possibility that Callisto owns, like Europa and Ganymede, a subsurface ocean of liquid salt water. For these reasons, Callisto is in the focus of a potential future space mission, named Gan De, planned by the National Space Science Center (NSSC) of the Chinese Academy of Sciences.

The subgroup "Orbit and Gravity Field Determination" of AIUB's satellite geodesy group has recently initiated a new project, financed by the Swiss National Science Foundation, where the exploration of Callisto with an orbiting spacecraft is studied. Realistic spacecraft tracking data from an orbiter around Callisto are simulated based on known orbits and Callisto gravity field models. Then these data are processed to reconstruct the orbits as well as geodetic quantities of Callisto. This is conducted using a version of the Bernese GNSS Software, which is developed at AIUB for planetary applications. The aim is to find families of spacecraft orbits around Callisto which are, on the one hand, well suited for the exploration of Callisto's interior structure, and, on the other hand, are compatible with the larger Gan De mission context. This project started in March 2020 with a PhD student, and is a collaboration between AIUB and the NSSC. First results were presented during the [Europlanet Science Congress \(EPSC\) 2020](#), which took place from 21 September to 9 October 2020. The abstract as well as the presentation are publicly available at <https://meetingorganizer.copernicus.org/EPSC2020/EPSC2020-754.html>