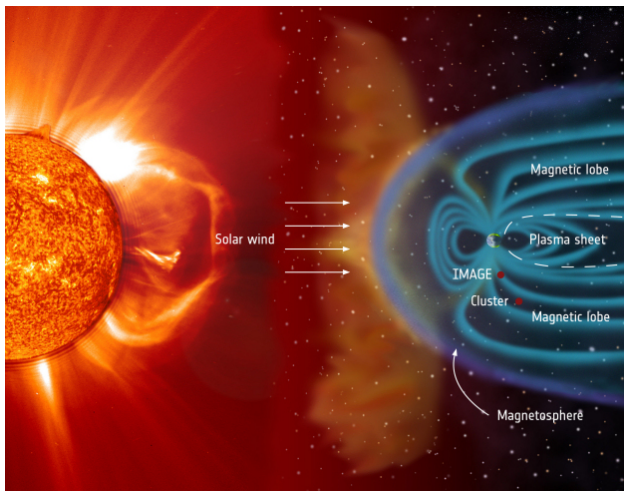


Are you interested in studying the different plasma flow behaviours in the near-Earth space?

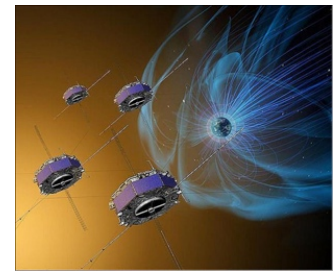
We offer **Master thesis project(s)** in the field of space plasma physics focused on investigating the plasma flows in Earth's magnetotail!



The magnetotail is commonly populated by intermittent earthward and tailward directed high-speed bulk flows of plasma, often termed as fast flows, flow bursts or bursty bulk flows (BBFs). These high-speed flows with speeds ranging from a few 100 km/s to > 1000 km/s are frequently detected by satellites and they are thought to be generated by an energization process commonly known as the magnetic reconnection. These BBFs can cause auroral intensifications and they thus contribute to why the polar skies are lit up!

A master thesis project could, for example, be focused on

- studying the properties of BBFs including the associated plasma velocities, electric fields and currents, magnetic forces, etc. The NASA's new Magnetospheric Multiscale (MMS) satellite mission provides a state-of-the-art instrumentation to investigate BBFs. The results are expected to advance our understanding of plasma transport in the magnetotail.
- studying the general plasma flows farther downtail at the Moon distance (mid-tail) by using measurements from the NASA's ARTEMIS satellites. Specifically, one can investigate how the interplanetary magnetic field (IMF) carried by the solar wind affects these flows. The results are expected to increase our understanding of how the IMF influences magnetotail dynamics.



You should have interest in studying our near-Earth space environment and have basic programming skills in Matlab. Familiarity with space physics (related) course(s) would be useful, but is not a prerequisite.

During the master thesis project, you will learn and get experience in satellite data analysis and observational space plasma physics research in general.

If you are interested in a project, please do not hesitate to contact us!

Timo Pitkänen, researcher, email: timo.pitkanen@space.umu.se, twitter: [@tps4ce](https://twitter.com/tpsp4ce)

Ghai Siung Chong, researcher, email: siung.chong@space.umu.se

Maria Hamrin, group leader, email: maria.hamrin@space.umu.se

The space plasma physics group in www: <https://www.umu.se/en/research/groups/space-plasma-physics-group/> and in twitter: [@UmeaSpace](https://twitter.com/UmeaSpace)