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# Satellite Tracking with NOT – Limitations and Possibilities

*Wednesday, 8 June 2022 11:30 (25 minutes)*

Tracking of artificial objects in orbit around Earth (for example satellites and discarded rocket bodies), as well as characterisation of capabilities, ownership, and operational status is an integral part of space situational awareness. This activity is becoming increasingly important as space gets more congested, but it also has relevant implications in other areas, such as policy making, diplomacy, and defence.

In this talk we will be presenting the results of efforts to test the Nordic Optical Telescope (NOT) for tracking and characterising satellites in different orbits. The aim was to assess NOT:s capabilities in the use-case and evaluate both its possibilities and present limitations. The results show that NOT can track objects with angular speeds of  $120''/s$  or slower, approximately equivalent to objects in orbits 4200 km from the surface and above. This includes for example satellites in geosynchronous orbit and navigation constellations such as GPS and Galileo.

We will also present results from characterisation of satellites using polarimetry and spectroscopy with the ALFOSC instrument, and direct lucky imaging with FASTCAM. We found that polarimetry alone is an efficient way to distinguish satellites.

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