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Fisica

A detailed image of the International Space Station (ISS) in orbit above Earth's atmosphere. The station's complex structure, including multiple modules and large solar panel arrays, is clearly visible against the blackness of space and the blue curve of the Earth.

PhD Program in Space Science and Technology - SST

Satellite orbital drag during magnetic storms: From Sputnik beeping to Starlink fireballs

Specific Seminar – Curriculum 2

October 12, 2026, 3.30 p.m.

Speaker:

Dr. Denny M. Oliveira - Post Doctoral Researcher, University Of Maryland Baltimore

Abstract:

Since the dawn of the space age, satellites have faced a largely invisible but powerful challenge: Earth's upper atmosphere. During magnetic storms, when the geomagnetic field is greatly disturbed enhancing ionospheric currents, the upper atmosphere heats and expands, increasing atmospheric **drag** and causing satellites to lose altitude faster than predicted. This presentation will explore the history and science of orbital drag, from the early days of Sputnik and the magnetic activity contributions to the recent loss of dozens of Starlink satellites during a moderate magnetic storm. Drawing on recent advances in space weather research, we will examine how magnetic activity modifies the upper atmosphere, why these effects are difficult to predict, and what this means for the growing number of satellites in very low-Earth orbit. The talk will highlight both the scientific questions and the practical implications for satellite operations in an increasingly space-reliant world.

Online attendance:

Information on remote participation can be requested by sending an e-mail to dn_sst@unitn.it