



Das Institut für Physik

Institutsbereich Geophysik, Astrophysik und Meteorologie

lädt zu folgendem Vortrag

im Rahmen des **Astrophysikalischen Kolloquiums** ein:

## "Space weather modelling with EUHFORIA"

Prof.Dr. Stefaan Poedts

KU Leuven (Belgium) & UMCS (Poland)

Solar Coronal Mass Ejections (CMEs) are large-scale eruptive events in which large amounts of plasma and magnetic field are expelled into interplanetary space at very high velocities (typ. 450 km/s, but up to 3000 km/s). When sampled in situ by a spacecraft in the interplanetary medium, they are termed Interplanetary CMEs (ICMEs). They are nowadays considered to be the major drivers of "space weather" and the associated geomagnetic activity. The detectable space weather effects on Earth appear in a broad spectrum of time and length scales and have various harmful effects for human health and for our technologies on which we are ever more dependent. Severe conditions in space can hinder or damage satellite operations as well as communication and navigation systems and can even cause power grid outages leading to a variety of socio-economic losses.

We aim at developing an advanced space weather forecasting tool, combining the MHD solar wind and CME evolution model **EUHFORIA** with the Solar Energetic Particle (SEP) transport and acceleration model **PARADISE**. We will first introduce EUHFORIA and PARADISE and then elaborate on our plans of to model the geo-effectiveness of impacts and mitigation to avoid (part of the) damage, including that of extreme events, related to solar eruptions, solar wind streams, and SEPs, with particular emphasis on its application to forecast Geomagnetically Induced Currents (GICs) and radiation on geospace. We will report on the status of the new global MHD coronal model (COCONUT), the improved heliospheric wind and CME evolution model (ICARUS), and the new advanced flux-rope CME models we are developing. The novel tool will be accessible by the whole space weather community via the ESA Space Weather Service Network as it will be integrated in the Virtual Space Weather Modelling Centre (VSWMC).

Date: **Wednesday April 27, 2022 - 16:00 CEST (online)**

<https://unigraz.webex.com/meet/manuela.temmer>

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