

Das Institut für Physik

Fachbereich Astrophysik und Geophysik

lädt zu folgendem Vortrag

im Rahmen des **Astrophysikalischen Kolloquiums** ein:

"A simple approach to modeling coronal mass ejections (CMEs) at the inner heliosphere"

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Coronal mass ejections (CMEs) are major eruptive events on the Sun that may induce geomagnetic perturbations and space weather impacts depending on their magnetic field direction, strength, speed, and duration. The coupling between the heliospheric environment and Earth's magnetosphere is strongest when the IMF direction is persistently southward (i.e., negative B_z) for a prolonged period. Predicting the magnetic profile of such Earth-directed CMEs is therefore critical for estimating their space weather consequences; this remains an outstanding challenge, however. In this talk, I will discuss an integrated technique to develop a comprehensive magnetic cloud prediction (MCP) model that can forecast the magnetic field vectors, Earth-impact time, speed, and duration of passage of solar storms without recourse to computationally intensive time-dependent dynamical equations. Based on the evaluation of this approach, we find that predicting the near-Earth properties of CMEs based on an analysis and modeling of near-Sun CME observations is reliable if the CME is not significantly impacted by heliospheric evolution. An event in a structured heliosphere is analyzed with distant multi-point observation to show how its evolution can change its local appearance significantly and make it difficult to predict CME magnetic field with such a modeling approach.

Date: **Wednesday January 18, 2023 - 17:00 CET (online)**

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