



Das Institut für Physik

Institutsbereich Geophysik, Astrophysik und Meteorologie

lädt zu folgendem Vortrag

im Rahmen des **Astrophysikalischen Kolloquiums** ein:

## **"Modelling solar and stellar activity from the dynamo to the corona"**

**Dr. Jörn Warnecke**

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On an active, cool star, the magnetic field, generated by a dynamo below the surface, permeates through the surface – forming star spots, reaching to the upper solar atmosphere, the corona, and eventually into space. In the corona, the plasma is heated to more than a million Kelvin. Furthermore, the coronal field can become locally unstable, triggering violent events such as flares and coronal mass ejections. On the Sun, the latter may affect the Earth by interacting with its magnetic field causing magnetic storms, which are known to disrupt power grids. Other solar-like stars exhibit similar magnetic activity, often stronger than on the Sun. Currently, models describing the origin of such events neglect that the magnetic field in the corona is actually generated below the surface. How the coronal magnetic field is linked to the sub-surface dynamo is the key to understanding, in a fundamental way, stellar activity and the associated violent eruptive events. I will present results of 3D MHD models of convective dynamos operating in solar-like stars, of solar and stellar coronae and as well the results of simplified combined dynamo-corona models to discuss the important aspect of modelling solar and stellar activity. This includes the questions: How does the solar activity fit into the stellar context? What is the effect of magnetic helicity in connecting the magnetic field generation below the surface and violent eruption above the surface? What are the main processes describing the stellar rotation-activity relation? How does future solar and stellar observations help us in understanding the processes of solar and stellar activity?

Date: **Wednesday March 3, 2021 - 17:00 CET (online)**

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

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