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UNI GRAZ

Das Institut für Physik

Fachbereich Astrophysik und Geophysik

lädt zu folgendem Vortrag

im Rahmen des **Astrophysikalischen Kolloquiums** ein:

"Commensurability between starspot rotation and planetary orbital motion in Kepler-17, Kepler-63, and HAT-P-11: a strange coincidence or planetary-modulated magnetic activity in late-type stars ?"

Antonino Francesco Lanza

INAF-Osservatorio Astrofisico di Catania, Via S. Sofia, 78- 95123 Catania, Italy

I shall introduce starspot occultations as a tool to detect surface brightness inhomogeneities in late-type stars with close-by transiting planets. Such occultations can be used to make precise measurements of the starspot recurrence at given longitudes or of stellar rotation us ing starspots as tracers. I report the intriguing cases of Kepler-17, Kepler-63, and HAT-P-11 where the rotation periods of occulted starspots show a commensurability within 1% with the orbital periods of their close-by massive planets, specifically with P_rot:P_orb ratios of 8:1, 4:7, and 6:1, respectively. Similar commensurabilities have been proposed to occur in several other stars hosting close-by planets, although with less precise measurements. They could be produced by tidal effects not accounted for by current tidal theories. A conjectural model is proposed to interpret such a phenomenon. It is based on the excitation of resonant oscillations in the interior magnetic field of an host star by a component of the planet tidal potential having a very low frequency in the reference frame rotating with the star itself. The advantages and the limitations of such an approach are briefly discussed.

Published papers on this subject:

- https://ui.adsabs.harvard.edu/abs/2022A%26A...658A.195L/abstract
- https://ui.adsabs.harvard.edu/abs/2022A%26A...665A..47L/abstract

Date: **Thursday March 30, 2023 - 17:00 CET (online)**

https://uni-graz.zoom.us/j/6435542130?pwd=L3hiTlBIM2s3RnpLMDV1azhU-UThtdz09

Dr. Teimuraz Zaqarashvili
Universitätsplatz 5/II, 8010 Graz, Austria

Tel.: +43 (0) 316 / 380-8604
E-Mail: teimuraz.zaqarashvili@uni-graz.at