Graduate School Seminar

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INSTITUT FÜR PHYSIK

Talks in WS 2019/20

Traditio et Innovatio

Universität Rostock

21st November 2019, **15:00 s.t.**

Anna Julia Poser

Statistical Physics

Clouds and the Inferred Metallicity of Giant Extrasolar Planets

Modeling observed planets in young open clusters and around mature stars offers a way to learn about planet formation and evolution, with the planetary composition as the link between the two. Uncertainties in the composition of giant planets are in part due to uncertainties in their thermal state. Their thermal history is, in turn, influenced by the atmosphere, which regulates the planetary heat loss.Planetary opacities play an important role in this context, as they influence the atmospheric temperature-pressure profile. Moreover, transmission spectroscopy indicates the presence of clouds in many gaseous planets.

Within an analytic atmosphere model, we here investigate the influence that different cloud opacities and cloud depths can have on the inferred metallicity of irradiated extrasolar gas giants. For that purpose, we perform coupled atmosphere, interior, and evolution calculations for the young hot Jupiter WASP-10b and for the hot Jupiter WASP-39b, whose observationally derived metallicity is higher than predicted by cloudless models.

Talk: English
Slides: English

Location: Institute of Physics, Albert-Einstein-Str. 23, SR Didaktik