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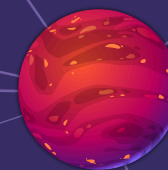


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Photosynthesis as an Engineering Problem

PROF. STEPHEN MOJZSIS *Bavarian Geoinstitute (BGI), Bayreuth*



Planetary surface constraints on Volcanic degassing

DIST. PROF. DONALD DINGWELL *LMU, Munich & Hangzhou Intl. Innovation Institute*

The HECATE space mission. A German Helium Geocorona and Atmosphere exploration satellite

DR. FRANK GRUPP *LMU & MPI-Extraterrestrial Physics, Munich*



Probing the subsurface of planetary objects

PROF. HEINER IGEL *LMU, Munich*

Landscapes of other worlds: Towards mapping exoplanet atmospheres

CYRIL GAPP *Geoastrometry Postdoc Fellow, LMU, Munich*





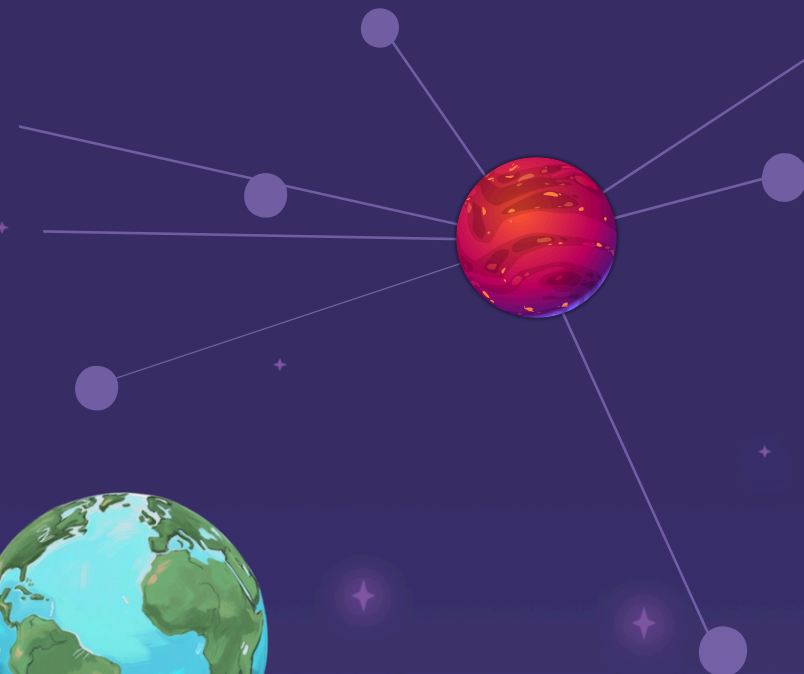
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PROF. STEPHEN MOJZSIS *BGI, Bayreuth*



Photosynthesis as an Engineering Problem

Nearly half a century ago, NASA defined the specific wavelength of the vegetation Red Edge - the sharp, sudden increase of plant reflectance between the red and infrared regions of the light spectrum. Although the Red Edge is now routinely used as an indicator of chlorophyll concentration and plant stress, a molecular-level understanding of this global-scale phenomenon remained elusive. Combining expertise in geobiology, physics, astronomy, and planetary chemistry, we report the first multi-scale description of the origin of the Red Edge on Earth, unveiling additional spectral features that have only recently been verified. Extending our understanding toward exoplanets orbiting distant stars, we predict a direct relationship between stellar properties and the photosynthetic life that could have evolved on exoplanets.

Our predictions will be tested in the coming years as ground- and space-based observatories continue to aim toward characterizing distant exoplanets.



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DIST. PROF. DONALD DINGWELL *LMU, Munich/Hangzhou*



Planetary surface constraints on Volcanic degassing

The surface conditions of planetary bodies vary greatly. They will have a direct influence on the physics of volcanic degassing. Thus defining the physics focussed by the atmospheric target is a central task of planetary physical volcanology. We will explore these possibilities in this talk.



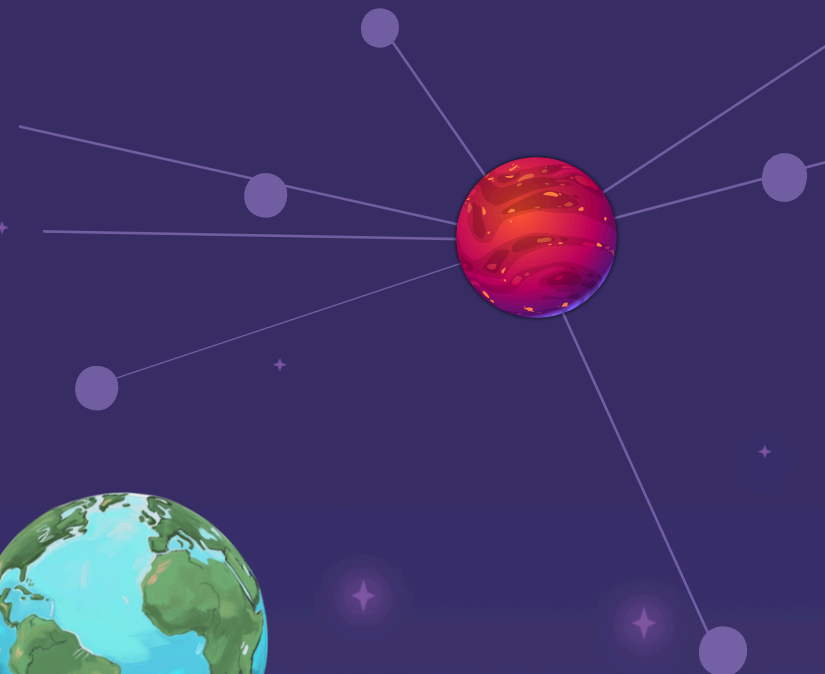
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DR. FRANK GRUPP *LMU and MPI-EP, Munich*



The HECATE space mission. A German Helium Geocorona & Atmosphere exploration satellite

HECATE is our proposal to investigate the Helium Geocorona, the highly dynamical major source of drag on spacecrafts in LEO-MEO orbits. Utilizing a high resolution UV-VIS spectrometer we plan to use the Earth as a proxy for exoplanets and answer question related to solar activity, metal enrichment and geocloral processes in the earths upper atmosphere.



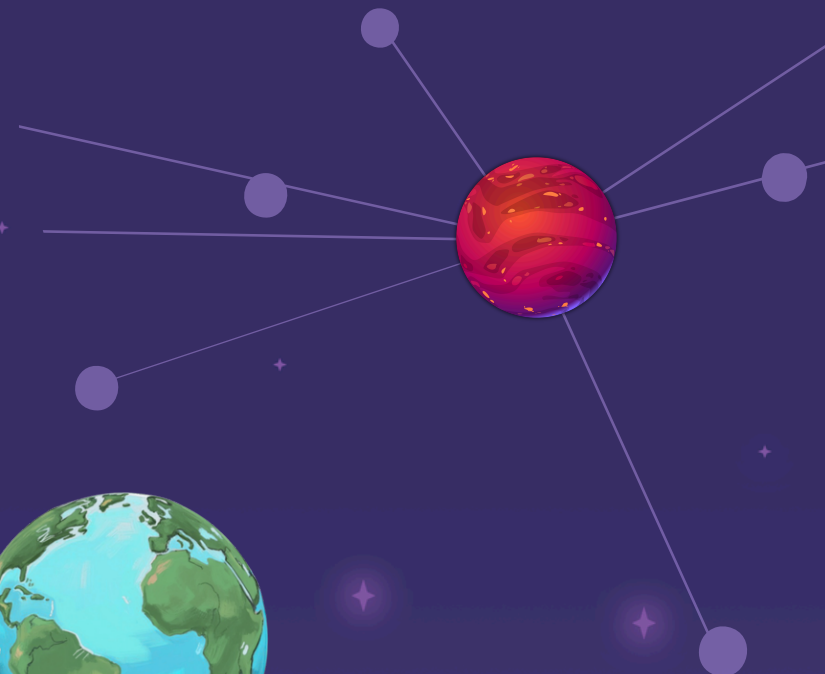
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PROF. HEINER IGEL *LMU, Munich*



Probing the subsurface of planetary objects

Probing the subsurface of planetary objects is tremendously important not only to understand their evolution but also to determine structures that are relevant for future missions such as ice-bearing rocks or lava tubes on the moon. We show re-analysis of Apollo 17 data using seismic background noise that originates from thermal cracking and interferometric methods to determine near surface structure. We propose strategies for lunar exploration with autonomous sensors that use AI-based methods to determine their experimental configuration in an optimal way.



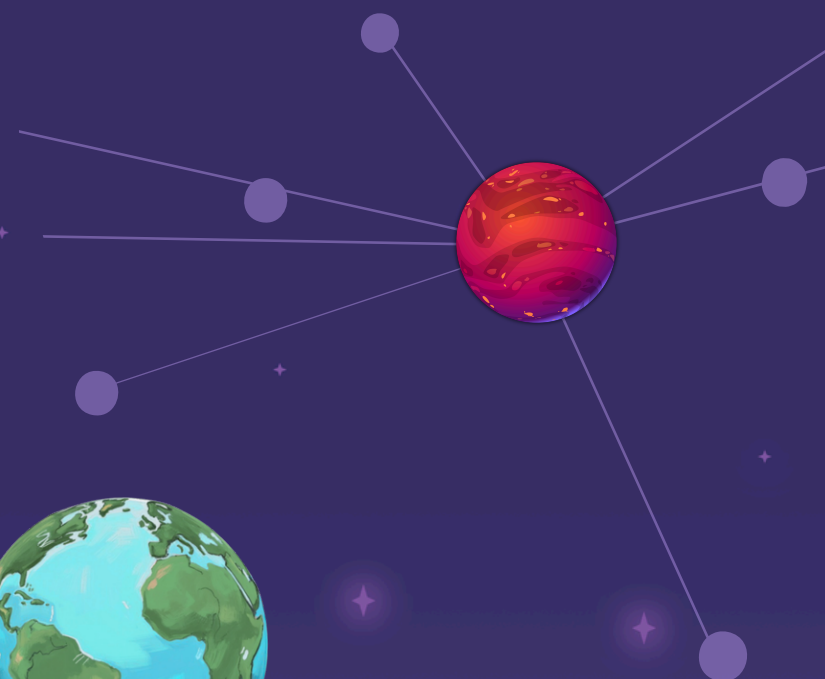
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CYRIL GAPP *Geoastronomy Fellow, LMU, Munich*



Landscapes of other worlds: Towards mapping exoplanet atmospheres

When you think about Planet Earth, you probably picture its beauty with the peaks and valleys, continents and oceans that make up the many faces of our home. Beyond Earth, all other planets of the Solar System show equally rich diversities of landscapes.

In this talk, I will outline how attempts at mapping planets outside of the Solar System - exoplanets - are giving us glimpses into the exotic diversity within the atmospheres of these strange distant worlds.