

Sommersemester / Summer Term 2013

BayCEER Kolloquium

Vortragsreihe Ökologie und Umweltforschung
Lectures in Ecology and Environmental Research

Sonderveranstaltung
Special Event

16. Mai / May 16
GEO, H 8

Außerirdische Ökosysteme? *Extraterrestrial Ecosystems?*

Mit Gästen des / *Guests from the* German Aerospace Center (DLR)
Institute of Planetary Research, Berlin

16:00 h

Dr. Hendrik Hansen-Goos

Life under extreme
conditions: The role of
liquid water at interfaces

17:00 h

Dr. Jean-Pierre de Vera

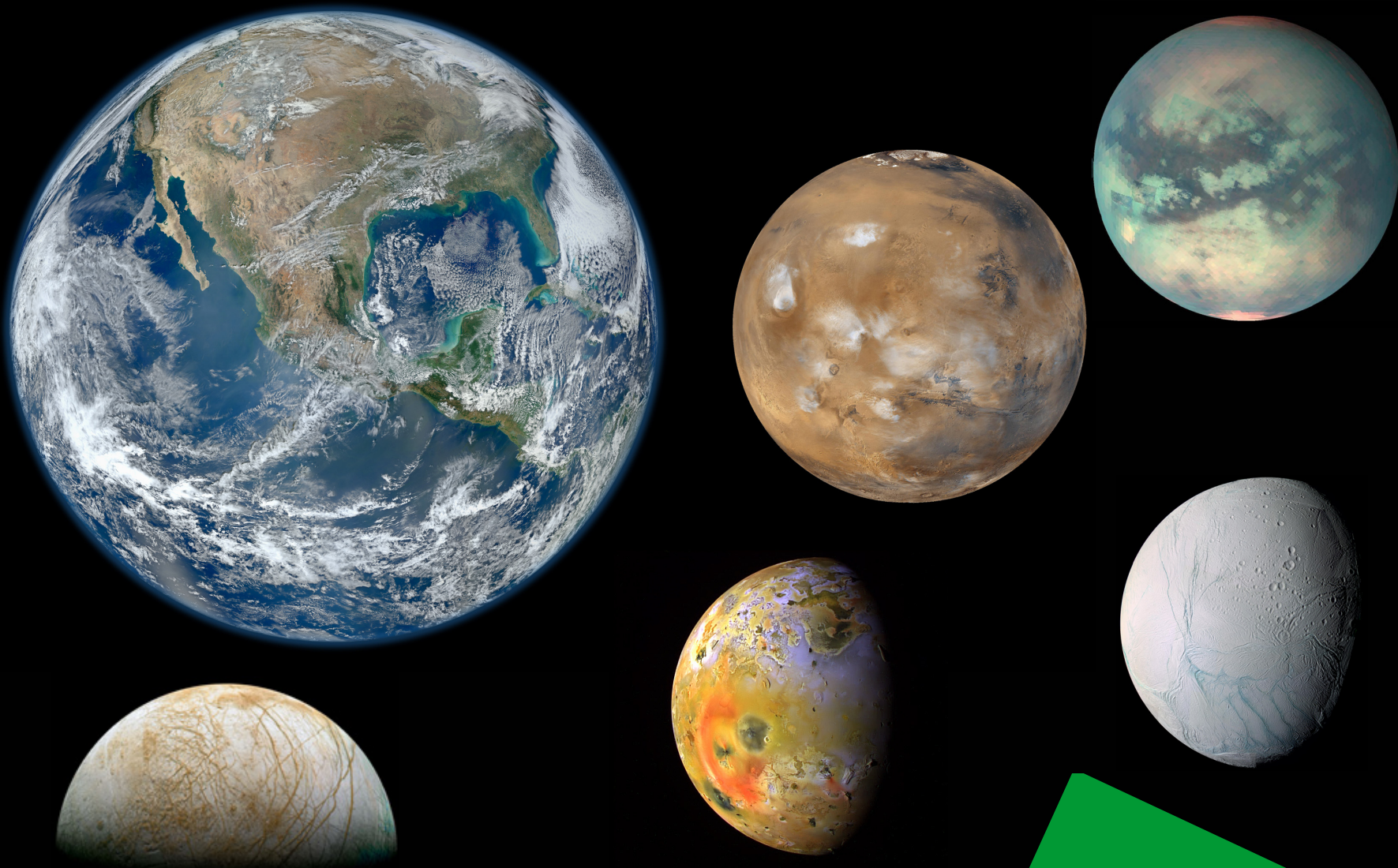
Life in the solar system
and beyond: Recent
knowledge in Astrobiology

Die Vortragsreihe
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Gäste
sind herzlich
willkommen!

*The lectures
serve as an inter-
disciplinary
platform for
students, junior
and senior
scientists.*

*Guests
are cordially
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**Life under extreme
conditions: The role of
liquid water at interfaces**

Physical mechanisms extending the domain of liquid water at interfaces into the solid and vapor regions of the bulk phase diagram are crucial for the survival of **life under extreme conditions** such as cold and dry climates. These conditions are encountered locally in polar and desert regions on Earth and globally on other planets like Mars. We discuss three classes of phenomena:

- (i) the premelting of ice, which allows for films and veins of liquid water at temperatures well below freezing,
- (ii) the adsorption of water on solid mineral surfaces, and
- (iii) the wetting of hygroscopic salts with the persistence of briny films even for thermodynamic conditions remote from those of bulk liquid water.

We describe how these mechanisms are used by a variety of organisms on Earth ranging from bacteria in permafrost to anti-freeze protein expressing arctic fishes and assess their significance for putative **microbial life on Mars**.

17:00 h

Dr. Jean-Pierre de Vera

**Life in the solar system and
beyond: Recent knowledge
in Astrobiology**

The question if our home planet Earth is unique in the universe or if other planets and moons might harbor life is one of the main scientific topics in the last decade. One of the most important characteristics to be habitable is the presence of an energy source and a liquid. Liquid water might play a central role in this context and can be expected on Mars as well as on other moons of the Jovian and Saturnian System, where oceans are supposed to be below a thick ice crust.

Are these worlds habitable? – Can we also expect **habitable planets and moons** in the extra-solar-systems? Model calculations and experiments were performed within the very young scientific discipline of Astrobiology. Different **microorganisms** being part of the three main domains of the tree of life as there are archaea, bacteria and eukaryotes, were tested before, during and after simulated planetary and real space conditions. Results of these experiments will be presented and might give important insights in the potential of other planets to be habitable.

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