

BayCEER Kolloquium

Lectures in Ecology and
Environmental Research

Summer
2020



UNIVERSITÄT
BAYREUTH

Donnerstag/Thursday

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5pm live talk & discussion
via ZOOM

online only!

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Morphodynamic modelling of sand dunes: From Earth's green coasts to Pluto's glacial plains

Sand dunes are ubiquitous in many desert and coastal areas of our planet. Their dynamics have impact on the local ecosystem and constitute a technological problem in many countries around the globe.

As I will discuss in this talk, morphodynamic modelling of Aeolian sediment transport and dune formation has been pushing forward our understanding of dune processes and their interaction with the biosphere. Moreover, dunes have been also detected in surprising locations of the solar system, including Mars and even Pluto. These extra-terrestrial dune fields constitute matter of research in the planetary science and provide excellent natural laboratories to testing our understanding of dune physics. In particular, New Horizons discovered methane ice dunes on Pluto, where the atmosphere is 100,000 times less dense than the Earth's. As I will show, insights about particle size and formative wind regime of Pluto dunes have been gained from our numerical simulations. Furthermore, I will discuss how the future application of our model will contribute to improving climate simulations, optimizing dune control and anti-desertification measures and simulating the evolution of the Earth surface from the particle scale to the regional scale.