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FAKULTÄT FÜR MATHEMATIK
Dekan Univ.-Prof. Dr. Radu Ioan Bot

Einladung zur öffentlichen Defensio von
Susanna Haziot

Thema der Dissertation

**MATHEMATICAL STUDIES OF HYDRODYNAMICAL CURRENTS AND
WAVE-CURRENT INTERACTIONS**

Abstract. This thesis consists of three chapters for which the underlying governing equations are Euler's incompressible equations of motion coupled with kinematic and dynamic boundary conditions. The first chapter provides a wave breaking-scenario for a shallow water approximation model, the Fornberg–Whitham equation, the second involves geophysical problems on a rotating sphere, and the third presents existence results for two-dimensional water waves of permanent form. Due to time constraints, this talk only focuses on the last topic.

Specifically, we will construct large-amplitude steady stratified periodic waves and large-amplitude steady solitary waves with constant density by means of analytic global bifurcation theory. Unlike in previous works on such waves, we allow for both internal stagnation points and overhanging wave profiles. For the stratified periodic waves we reformulate the problem as a quasi-linear pseudodifferential equation involving the periodic Hilbert transform, where the unknown expresses the elevation of the wave profile. The existence proof for the solitary waves relies on a novel reformulation of the problem as an elliptic system for two scalar functions in a fixed domain, one describing the conformal map of the fluid region and the other the motion of the flow. The latter is a joint work with Miles H. Wheeler (University of Bath).

Prüfungssenat:

Univ.-Prof. Mag. Dr. Andreas Cap
(Vorsitz)
(Universität Wien)

Univ.-Prof. Adrian Constantin, PhD
(Universität Wien)

Prof. Dr. David Lannes
(Université de Bordeaux et CNRS UMR 5251)

Prof. Dr. Pierre Germain
(New York University)

Zeit: Freitag, 28. Mai 2021, 15:00 Uhr

Ort:

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pwd=d1JwWkxiZDhkTlZKKzRLcVE1ZS9FZz09

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