universität wien

Fakultät für Mathematik

Mathematisches Kolloquium

Mittwoch, 29. Mai 2019
Sky Lounge

EINLADUNG

Samuel Walsh
(Univ. Missouri)

„Water waves with localized vorticity“

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Abstract:
For a mathematician, a water wave can be defined as a solution to the free boundary incompressible Euler equations. The vorticity is then the curl of the velocity field. Over the past decade, there has been a great deal of research into the existence and qualitative properties of traveling water waves with non-trivial vorticity. One of the most interesting sub-species of rotational waves are those for which the vorticity is localized in space. Imagine, for example, a large eddy in the interior of the fluid, or a wake of vortices created by a submerged body.

The intention of this talk is to offer a fairly broad introduction to these waves, with an emphasis on recent advances and areas of current research. In particular, we will discuss: the existence and stability/instability of traveling waves with a point vortex or dipole; stationary waves with an exponentially localized vortex „spike“; and time-periodic rotating vortex patches. Mathematically, this body of work draws on ideas ranging from singularly perturbed elliptic PDE theory, nonlinear dispersive equations, infinite-dimensional Hamiltonian systems, and Riemann-Hilbert theory.

15.45 Uhr: Kaffeejause

16.15 Uhr: Vortrag

vinum cum pane im Anschluss

Christian Krattenthaler