

UCCS Department of Mathematics

Math Colloquium Series

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DATE:

THURSDAY,
JANUARY 23, 2020

TIME:

12:30PM-1:30PM
(REFRESHMENTS AT 12:15PM)

LOCATION:

UNIVERSITY CENTER
#122

The Singularities of 2D Fluid Flows with Free Surface



Abstract: We study 2D incompressible fluid with a free surface under the assumption that fluid flow is potential. We use a time-dependent conformal map from the complex half-plane to the fluid domain, and study the analytic continuation of the complex fluid potential, and the conformal map outside of the fluid. In a generic setting we find that the singularities of conformal map, and complex potential are algebraic branch points, and poles of various orders. Moreover, we find new constants of motion associated with the singularities, and discuss the possibility of integrability of water waves.

We illustrate with numerical simulation of breaking waves, and show evidence that it is the square-root singularity that is responsible for the formation of plunging breakers and whitecaps in the ocean.

For More Information please contact the UCCS Math Department at
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