



**THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY**

**Department of Mathematics**

**SEMINAR ON PDE**

**Steady vortex rings with surface tension**

**Prof. Christian Seis**

Universität Münster, Germany

**Abstract**

The existence of steady vortex rings for the two-phase Euler equations with surface tension is studied, describing the evolution of a perfect bubble air ring in water. Such objects are created in nature by cetaceans such as dolphins or beluga whales, and they appear to be surprisingly stable configurations. The mathematical model features a vortex sheet on the surface of the air bubble. We construct such vortex rings with small cross sections with the help of an implicit function theorem and derive the asymptotics of various quantities for small cross sections. Joint work with David Meyer (Münster).

**Date: 7 March 2024 (Thursday)**

**Time: 4:00pm**

**Zoom Meeting: <https://hkust.zoom.us/j/98952757926> (Passcode: 340496)**

*All are Welcome!*