Seminar/Talk

New geometric theorems about Fluids and Conics

Albert Chern
UCSD

Host: Chris Wojtan

This talk consists of two recent work, one about topological and geometric analysis on fluid dynamics, and the other about Penroses 8-conic theorem. Vorticity formulation is a widespread description in fluid mechanics. However, its applicability has been limited to simply-connected domains. We show that on non-simply-connected domains, fluids cohomology component plays an important role and can interact with the vortices. This interaction corresponds to a new equation of motion and new conservation laws which can be viewed as Casimir invariants in Hamiltonian formulation of fluid dynamics. The new equation allows us to construct new analytical unsteady solutions to Eulers equation. We also show that viscosity and curvature produce vortices through an elegant formula.The second part of the talk is about an incidence theorem about conics in double contact, first discovered by Sir Roger Penrose in his undergraduate years but remained unpublished until recently revealed in interviews. The theorem includes as special cases many well-known theorems of projective geometry as well as in metric geometries. Through collaboration with a few projective geometry enthusiasts and Penrose himself, the theorem is further developed.

Thursday, September 4, 2025 01:30pm - 03:30pm
Sunstone Bldg / Ground floor / Big Seminar Room A / 27 seats (I23.EG.102)

This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station. Please find a schedule of the ISTA Shuttle on our webpage: https://ista.ac.at/en/campus/how-to-get-here/ The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.

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