



GEOMETRY WORKSHOP

Wednesday, July 2. 2025, Matematicum, room 134, building 303B

Ca. Time	Speaker
13:00 – 13:45	Antonio Alarcón
14:00 – 14:45	Enrique Pendás-Recondo
14:45 – 15:15	Coffe and cake
15:15 – 16:00	Jens Gravesen
16:15 – 17:00	Vicent Gimeno Garcia
Ca. 18:00 –	Dinner

TITLES AND ABSTRACTS: P.T.O $\mapsto$

- Antonio Alarcón, Departamento de Geometría y Topología de la Universidad de Granada:

Generic properties of minimal surfaces

We shall discuss some (somewhat surprising) properties of minimal surfaces in Euclidean space which hold generically in Baire category sense.

- Enrique Pendás-Recondo, Departamento de Matemáticas de la Universidad de Oviedo:

Zermelo navigation with tacking

Zermelo navigation is the problem of finding the fastest trajectory between two points for a moving object subject to a current (such as a boat or aircraft in the presence of wind). The classical version of this problem assumes that the speed profile of the object forms a strongly convex geometric shape, in which case the solution is always a smooth curve. In this talk, we will explore the case when the speed profile is non-convex, resulting in optimal curves with turning points, such as the zigzag trajectories seen in real-world scenarios like sailboat navigation or the flight patterns of albatrosses.

- Jens Gravesen, DTU Compute:

Tilings on curved surfaces

Tilings of the plane, sphere and hyperbolic space are well studied subjects with a long history. But if we consider physical manifestations of tiling, that is, a figure or object composed of many copies of the same shape, or a limited number of distinct shapes, there is no special reason why a given tile should be of constant curvature, or that the total space need be homogeneous. We define a class of regular surfaces, tileable surfaces, that admit geometric tilings by a finite number of congruence classes of tiles. We show how to construct many examples, and examine the relationship with the well known tilings of the plane and sphere, as well as polyhedra.

- Vicent Gimeno Garcia, Departamento de Matemáticas de la Universitat Jaume I de Castelló:

Willmore Energy and Quantum Oscillations of a Particle Confined to a Surface

Joint work with Steen Markvorsen and Daniel Salvador-Ramírez. In this talk, following the approach introduced by Da Costa for quantum particles confined to a surface, we explore how the geometry of the surface influences the physical properties of the particle. In particular, we analyze how the Willmore energy of the confining surface affects the energy spectrum of the particle. We also focus on a specific class of surfaces that admit stationary constant wave functions, and in this context, we will pose a geometric open problem. Finally, for surfaces where the constant wave function is not stationary, we uncover a novel and intriguing oscillatory phenomenon.