

UNIVERSITAT DE BARCELONA



UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

Barcelona Analysis Seminar2022–2023URL. https://mat.uab.cat/web/seminarianalisi/Date. June 8, 2023Time. 15:00 CETRoom. T2 (Universitat de Barcelona)Online streaming (Zoom). Click here to join.

Regularity of Elliptic Transmission Problems

María Soria-Carro

Rutgers University

Transmission problems describe phenomena in which a physical quantity changes behavior across some fixed surface, known as the interface. The analysis of such problems started in the 1950s with the pioneering work of Picone in elasticity. Nowadays, they have a wide range of applications in different areas, such as electromagnetic processes, composite materials, and climatology. Typically, solutions are not differentiable across the interface, and the primary interest is to study their optimal regularity from each side of this surface.

In this talk, I will discuss two elliptic transmission problems where the interface has minimal regularity. The first problem is for harmonic functions, and I will explain the main ideas and techniques used to prove the optimal regularity of solutions at the boundary. The second problem is for fully nonlinear equations, and I will focus on how to obtain a maximum principle (ABP estimate) for this problem, which plays a key role in the regularity theory of viscosity solutions. These results are part of my Ph.D. dissertation, and they are in collaboration with Luis Caffarelli and Pablo Raúl Stinga.