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SEMINARIO IPCT MAYO 2025

EXPOSITOR: Nicolás Barnafi, Universidad Católica de Chile

TÍTULO: The inverse elasticity problem, its extension to porous media and applications in biomedicine

RESUMEN: The inverse elasticity problem can be simply stated as: given a deformed configuration and the forces that act on it, find an initial stress-free configuration such that when the given forces are applied to it, one recovers the given deformed configuration. Surprisingly, this problem can be framed as a (direct) elasticity one, whose mathematical properties are inherited from the original direct problem if the underlying material is sufficiently regular.
In this seminar, I will review this problem and its main mathematical properties. After this brief introduction, I will show some artifacts that appear when solving this problem, such as self-intersections and geometrically incompatible solutions. The talk will finish with an extension of this system to poroelastic materials, where I will show that the strong form of the equations does not allow for a weak formulation, and this requires some special treatment. All models will be shown to work in realistic heart geometries.

IDIOMA: Español

DÍA / HORA: Viernes 9 de mayo del 2025 / 15:00 – 16:00 hrs.

LUGAR: Auditorio del Departamento de Matemática y Ciencia de la Computación, Universidad de Santiago de Chile

DIRECCIÓN: Av. Libertador Bernardo O'Higgins 3363, Estación Central.

MODALIDAD: Presencial y transmisión online por Microsoft Teams

WEB: https://eventos.cmm.uchile.cl/seminarioipct