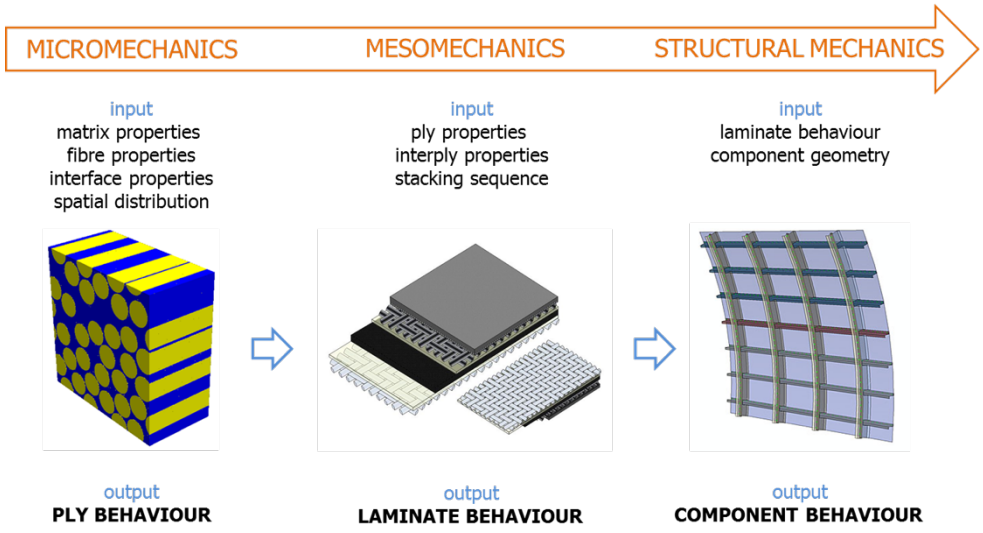
PhD RESEARCH PROJECT

IMDEA Materials Institute (Madrid Institute for Advanced Studies of Materials) is a non-profit, private research organization, promoted by the Regional Government of Madrid, Spain, to carry out research activities in Materials Science and Engineering. The research institute is part of IMDEA, a new institutional framework that combines public and private support and harmonizes research with market demand, encouraging the private sector to participate in the design of science. IMDEA Materials Institute is committed to excellence in research and to fostering technology transfer to the industrial sector in a truly international environment. More information can be found at www.materials.imdea.org

IMDEA Materials has a PhD position available in the field:

MULTISCALE COMPUTATIONAL MECHANICS OF ADVANCED COMPOSITES

IMDEA Materials is developing a novel approach to the determination of the mechanical behavior of composite materials up to failure using numerical and experimental techniques in parallel [1]. The approach is based on bottom-up multiscale virtual testing to take into account the physical mechanisms of deformation at different length scales on the behavior of the composite. This hierarchical multiscale approach describes systematically the material behavior at different length scales from ply to laminate to component level, allowing the determination of ply properties, laminate characteristics and structural response (see Figure below). This approach constitutes a promising toolset to provide significant efficiency gains in the design, testing and certification of composite aircraft structures.



The work of the PhD candidate is to contribute to these developments by conducting research in one or several of following areas: i) composite material models including damage and failure; ii) advanced simulation strategies based on the Finite Element Method (ABAQUS); iii) experimental validation by means of coupon testing; iv) design and optimization of composites using the developed tools.

[1] C.S. Lopes, C. González, O. Falcó, F. Naya, J. Llorca, B. Tijs, Multiscale virtual testing: the roadmap to efficient design of composites for damage resistance and tolerance, CEAS Aero. Journal (2016) 7: 607-619

Interested candidates please contact:

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