

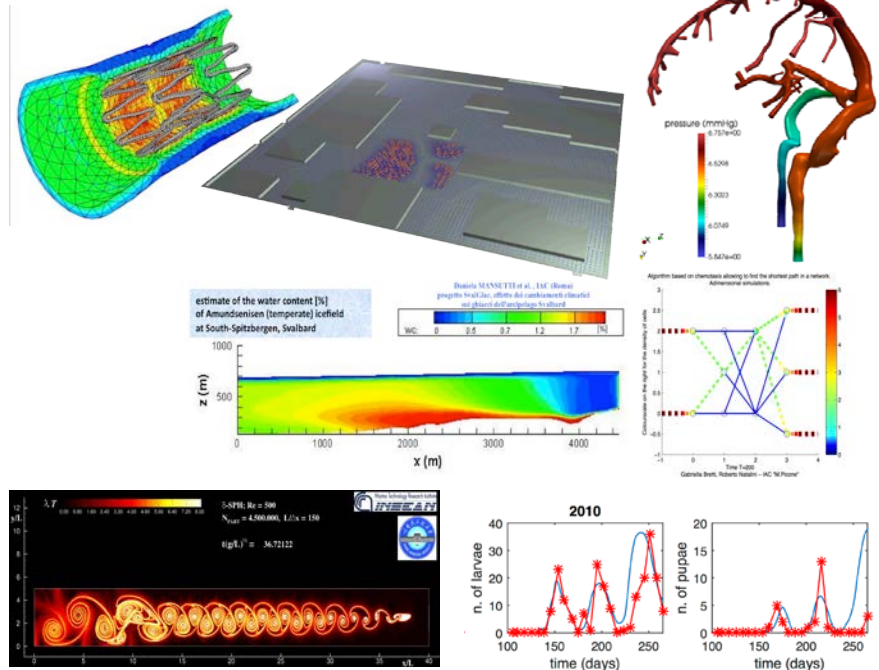


Project Area: Applied Mathematics

Objective: The goal that we are pursuing is twofold. On the one hand, we aim at developing, analysing and implementing innovative methodologies in different fields of applied mathematics. On the other hand we want to study its application in different frameworks: in those fields where the problems are already posed in “mathematical form”, with the development of alternative, more robust and efficient formulations, the use of methodologies and the “certification” of the results; and also in fields where the problems are not yet described in “mathematical form”, with the contribution of our expertise in modelling in interdisciplinary context, and the development of analytical and computational solution tools.

Approach: Different methodologies stemming from the fields of modeling and scientific computing, stochastic modeling and data analysis, optimization and discrete mathematics, system theory and optimal control, will be employed. A key feature of the mathematical approach is the capability of recognizing and exploiting the structural similarities between different fields, allowing to “transfer” the methodologies developed in a given framework to different, possibly very far, contexts.

Figures:



Scientific Impact/Results: The research will be aimed at tackling applications as diverse as industrial processes, mechanical engineering, health and well being, biology, physics, smart cities, advanced materials, climate, environment, naval engineering, cultural heritage, high performance computing, logistics, traffic, risk management, energy, virtual prototyping.