

ADVANCED MODELS AND METHODS TO ENHANCE SUSTAINABILITY

D. CONTE*, **R. D'AMBROSIO#**,
S. MIRABELLA⁺, **S. PEROTTO⁺** AND **G. SPERONI⁺**

* Università degli Studi di Salerno,
Via Giovanni Paolo II, 132, Fisciano (SA), Italy, I-84084
dajconte@unisa.it

#Università degli Studi dell'Aquila,
Via Vetoio, Loc. Coppito, L'Aquila, Italy, I-67100
raffaele.dambrosio@univaq.it

⁺MOX, Department of Mathematics, Politecnico di Milano
Piazza L. da Vinci, 32, Milano, Italy, I-20133
{susanna.mirabella, simona.perotto, giacomo.speroni}@polimi.it

ABSTRACT

In an era where ecological challenges are increasing and environmental responsibility is paramount, achieving a balance between economic, scientific growth, and sustainable development is a global priority. To reach this balance and gain crucial insights into the behavior of both natural and human-made systems, the integration of advanced technologies and scientific approaches has become an essential tool. This special session aims to foster discussions on the application of mathematical modeling, numerical methods, data analysis, and information technology in proposing innovative solutions for sustainable development across various sectors. By simulating natural processes, optimizing resource use, and proposing green transformation strategies, these tools provide the foundation for a future that harmonizes human progress with responsible environmental management.

Key topics of focus include data-driven modeling and analysis of vegetation problems in smart agriculture, simulation of material deterioration dynamics, and machine learning applications. Further areas of exploration encompass multi-criteria decision aiding, green and digital transformation through IoT, recommender systems for sustainable choices, green computing, sustainability in ICT, efficient solutions for data centers, and sustainable supply chain management. Through promoting interdisciplinary dialogue and knowledge sharing, this session aims to drive progress toward a more sustainable future by encouraging research within the framework of mathematical modeling and computational techniques, applied to foster greener industrial development.