

PhD: Materials Science
and Nanotechnology



INTEGRATED DEVELOPMENT OF SOLID OXIDE ELECTROCHEMICAL CELLS

From AI-Assisted Materials Discovery to Advanced Energy Devices

FRIDAY 25 SEPTEMBER 2026

15:00–16:00

Aula A - Dipartimento di Fisica e Astronomia "Ettore Majorana" – Univ. Catania

Via Santa Sofia 64, Catania

A multidisciplinary pathway from computational design to materials synthesis, characterization and electrochemical device validation

MACHINE
LEARNING



DFT & AB INITIO



SYNTHESIS &
CHARACTERIZATION



DEVICES &
PROTOTYPES

L. G. Zandavalli

M. V. Barp

S. Vecino-Mantilla

M. Lo Faro

HOSTED BY Prof. Salvatore Mirabella and Prof. Paolo Musumeci

SEMINAR PROGRAMME

15:00–15:05

Welcome and introduction

Prof. Salvatore Mirabella and Prof. Paolo Musumeci

15:05–15:15

Integrated Solid Oxide Electrochemical Technologies

State of the art, prototype examples, ongoing projects and future research directions

Dr. Massimiliano Lo Faro, CNR-ITAE

15:15–15:25

Machine Learning for Perovskite Property Prediction

Dr. Luiz Gustavo Zandavalli, CNR-ITAE/UniCT

15:25–15:40

Accelerating Materials Discovery: From Ab Initio to AI

Dr. Marcos Vinicio Barp, CNR-ITAE

15:40–15:55

From Powders to Devices: Synthesis and Characterization of Advanced SOC Materials

Dr. Sebastian Vecino-Mantilla, CNR-ITAE

15:55–16:00

Discussion and Q&A

Scientific exchange and closing remarks

MORNING PROGRAMME

Laboratory tour at DFA and informal scientific discussions with researchers and PhD candidates.

Solid Oxide Electrochemical Cells
SOFC | SOEC | rSOC

Materials discovery | Experimental validation
Energy conversion | Green hydrogen

Acknowledgements

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