

# DOCTORATE FINAL DISSERTATION

XXXVII cycle (PON REACT EU)

## International Doctorate in Architecture and Urban Planning (IDAUP)

Coordinator IDAUP: Prof. Theo ZAFFAGNINI  
Vice-Coordinator: Prof. Besnik ALIAJ  
DA Vice-Coordinator IDAUP: Prof. Veronica BALBONI  
DA Ph.D Program Supervisor: Prof. Elena DORATO  
POLIS Ph.D Program Supervisor: Prof. Malvina ISTREFAJ

### Antonello AQUILANO

*Waste Treatment: Mining of Critical Raw Materials from Landfills of  
Ornamental Granitoid Scraps.*

Supervisor: **Prof. Luca EMANUELI** Co-Supervisor: **Prof. Carmela VACCARO**

### Enrica BOLDRIN

*Renewables and Energy Efficiency in Residential and Industrial Districts:  
an Integrated Approach for the Generalized Energy and Exergy Optimization of Complex  
Urban Systems and their Networks and Infrastructures, through a Holistic and LCA-Based  
Methodology Applied to Open Systems.*

Supervisor: **Prof. Roberto DI GIULIO** Co-Supervisor: **Prof. Giacomo BIZZARRI**

### Laura FERRARI

*Renewable Energy Sources and Energy Efficiency in Residential and Industrial Districts: An  
Integrated Approach for the Energetic and Exergetic Improvement of Complex Urban  
Systems and their Infrastructures, through an Olistic Approach and LCA.*

Supervisor: **Prof. Roberto DI GIULIO** Co-Supervisor: **Prof. Giacomo BIZZARRI**

### Gabriele FREDDUZZI

*Tools for Sustainable Design Strategies: Optimization of Integrated BIM-Blockchain  
Technologies and Protocols for Applying Green Public Procurement (GPP) Requirements to  
the Intervention on the Existing Built Environment.*

Supervisor: **Prof. Marcello BALZANI** Co-Supervisor: **Arch. Massimo STEFANI**

### Luca MORGANTI

*Lifecycle Environmental and Circular Assessment in Building Product Manufacturing.  
Systemic Approach for Data Optimization of Custom Prefabricated Façade Modules.*

Supervisor: **Prof. Theo ZAFFAGNINI** Co-Supervisor: **Dr. Alessandro PRACUCCI**

### Andrea NALE

*Multi-scale Structural Optimization with Embedded Architected Materials for Large-Scale  
Additive Manufacturing.*

Supervisor: **Prof. Giuseppe MINCOLELLI** Co-Supervisor: **Prof. Andrea CHIOZZI**

### Dario RIZZI

*Tools for Sustainable Design Strategies: Optimization of Integrated BIM-Blockchain  
Technologies and Protocols for the Application of Minimum Environmental Criteria.*

Supervisor: **Prof. Marcello BALZANI** Co-Supervisor: **Dr. Fabiana RACO**

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**Prof. Francesca PICCHIO**  
University of Pavia, Italy

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**Prof. Vittorino BELPOLITI**  
University of Sharjah, UAE

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