

## Special session about Sustainable Architecture

within the “RILEM Spring Convention & Conference on durability of building materials and systems in the transportation infrastructure”

**Title:** Bio-Based Materials and Beyond

**Chairs:** Ena Lloret-Fritschi (USI), Sacha Cutajar (USI, PhD), Prof. Stefano Zerbi (SUPSI), Antonio Caggiano (University of Genoa, Italy), Gonzalo Barluenga (University of Alcala, Spain), Romildo Dias Toledo Filho (Federal University of Rio de Janeiro, Brazil), Eddie Koenders (TU Darmstadt, Germany).

*This special session will explore research and findings along with novel methodologies for advancing sustainable architecture using bio-based materials and related bio-inspired practices. It aims to bridge the gap between new and traditional approaches to create eco-friendly, durable, carbon-neutral and energy efficient buildings.*

**Symposium themes:**

### 1. Sustainable Construction Methodologies:

- **Extending the Life Span of Existing Structures:** Research on digital design and fabrication strategies for effectively utilizing recovered or recycled building materials.
- **Alternative Materials for New Construction:** Explore advances in unconventional materials and optimization techniques to minimize/optimize material usage. Discuss challenges such as adapting to building codes, overcoming time constraints, and ensuring durability.
- **Digital Technologies:** Explore digital design and fabrication methods that integrate new materials and techniques into the AEC industry, promoting sustainable and innovative practices.

### 2. Bio-Based Carbon-Neutral Materials:

- **Exploring Bio-Based Composites:** Investigate the use of plant components, agricultural by-products, and earth-based components in conjunction with mortars and concretes. Discuss the integration of plant fibers (e.g., sisal, curauá, jute) and bio-aggregates as partial replacements for traditional materials.
- **Innovative Applications:** Examine systems incorporating organic and/or mineral matrices with vegetal textiles, wood-based bio-composites, and bio-based self-healing cementitious composites (i.e., using bacteria as healing agents).
- **Net-Zero Energy Strategies:** Address energy-efficient materials and structures that contribute to achieving net-zero energy/carbon buildings.

**Special Highlights:** International Research, Dissemination from wider EU consortia and EU-funded projects are welcomed. In this sense, the results from the EU-funded project "Bio-based Energy-efficient Materials and Structures for Tomorrow" (BEST, HE-MSCA-SE-2021, 101086440, <https://cordis.europa.eu/project/id/101086440/>), will be disseminated during the session.