

**Call for application for research scholarships  
for post-graduate international candidates**

**RESEARCH PROJECT N. 55**

<b>Title</b>
<b>Biomimetic approach applied to sustainable construction. Methods, materials and design applications.</b>
<b>Scientific responsible (name, surname, role)</b>
Caterina Mele, Associate Professor ( <a href="mailto:caterina.mele@polito.it">caterina.mele@polito.it</a> )
<b>Short description of the research activity (max 250 words)</b>
<p>The research activity consist on the exploration of the multidisciplinary biomimetic approach in architectural and technological design, through the analysis of complex projects, the experimentation of innovative technological solutions and materials applied to the building. In the present challenges infact the biomimetic approach can be an unexplored pathway to the sustainable architectural design, both for existing building and for new constructions. Biomimetics consists of applying natural methods and systems to architectural, engineering and technology issues, pointing out solutions impossible to achieve without being able to get help from nature. Specifically, Biomimetic Architecture brings us closer to a deep natural design, taking into account the strategies and solutions used by nature. Applying them in several aspects, it originates a more nature-oriented design, it makes the resource usage more efficient and it saves land, water, energy and so on. In general there are three areas in biology, from which technological solutions have been modeled:</p> <ul style="list-style-type: none"><li>• The replication of natural manufacturing methods (such as the production of chemical compounds by plants and animals).</li><li>• Imitation of mechanisms found in nature (such as velcro and the gecko tape).</li><li>• Emulation of the principles of social organization of organisms (such as ants, bees and microorganisms).</li></ul> <p>This project intends to explore all three of these areas, both from the design point of view, and from the technology and materials, in order to identify solutions and methodological elements that can be replicated and applied in architectural design and construction.</p>
<b>Specific requirements (experiences, skills)</b>
Preferably: Master degree in Architecture or Building Engineering with experience in theoretical and applied design; Research experiences and knowledge on Biomimetic applied to architecture and construction; Good knowledge of English and Spanish; Advanced knowledge of architectural and constructive modeling computer programs.
<b>Website of the research group (if any)</b>
None website
<b>Keywords (min 3, max 6)</b>
Biomimetics, nature-oriented design, sustainable construction, resilience
<b>Research Area (max 1)</b>
Design