Chiara Bertolin, PhD

My research interests focus on STEM – Science, Technology, Engineering and Mathematic and more precisely at the intersection between Microclimate and Climatological studies to detect climate change impacts; condition monitoring and structural integrity of materials using NDTs; and applied physics to evaluate climate-induced mechanical decay mainly on hygroscopic materials.

These interests are the results of:

- my academic positions as Onsager and outstanding fellow focused on topics dealing with: “Zero emission refurbishment of the built environment” and on “Climate Change impact on the built environment”
- my teaching courses on “Cultural heritage within the course GHG emission as design-parameter” and “Structural health monitoring and no destructive techniques”;
- my background as Physicist and my interest on the current STEM challenges existing in the society.

This grounding led me in developing fully interdisciplinary and multidisciplinary research directed towards 3 main research topics (RTs) which often are intersected:

RT1 - Statistical data analysis and data feature extraction in Atmospheric Science and Climatology aimed to detect Climate Change including climate reconstruction over centuries; to forecast and/or detect risk of extreme events to suggest adaptation options; to propose methods to integrate life cycle assessment within the framework of structural integrity and sustainable conservation principles.

RT2 - Design, implementation, and Analysis of experimental results on condition monitoring, engineering monitoring and microclimate-condition monitoring in laboratory and in situ using NDTs as for example the acoustic emission, the digital image correlation, and the infrared thermography to evaluate the climate-induced effect on structure, products and materials (especially mechanical decay on hygroscopic and/or historic materials) and their durability.

RT3 – Applied environmental studies to assess existing conditions and damage appearance (e.g. location and severity especially of mechanical decay) in products of the built environment to propose environmental sustainable maintenance and management actions. My recent focus if on innovative mitigation solutions nature-based (e.g. vertical green structure and green roof) or bio-inspired and architecture-inspired to achieve a sustainable energy transition in the built environment.