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Magnetic Force-Free Theory: Nonlinear case

The focus of this paper deals with innovative material and construction systems that incorporate nanotechnologies for improving their energy-saving performance. Recent developments in the world of phase change materials, specifically on organic PCMs, such as paraffin and bio-PCM aerogel, are presented; laboratory works are presented together with pilot projects in Toronto, where PCM-based systems have been incorporated in high-performing buildings. Then, the paper shows recent advancements in super-insulating materials, specifically focusing on aerogel-enhanced blankets and panels, which have been developed at the BeTOP laboratory of the Ryerson University in Toronto, Ontario. Finally, the paper explores the potentialities of including innovative thermochromic coatings at the urban scale and shows the mutual benefits between buildings and communities that could be obtained through the adoption of previously mentioned nanotechnologies. The goal is to describe a pathway towards more sustainable and resilient communities. Using Toronto as a test case, the paper aims to comprehensively show that nanotechnologies offer a paradigm shift at the different scales of the built environment.

Biography

Brunello Tirozzi is a professor in the Department of Physics, University of Rome. His research interests are Elementary Particle Physics, Statistical Mechanics, Dynamical Systems, Disordered Systems Renormalization Group, Neural Networks, Neurobiology, Asymptotic methods, fluidynamics, typhoons, tsunami, Plasma Physics. He has published over 200 research papers and participated in various International Conferences.

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