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## Nanostructured biomimetics surfaces of extreme wetting properties

Materials of extreme wetting properties offer new perspectives in the design and preparation of water-repellent, oil-repellent, self-cleaning, dirt-free, anti-adhesive, anti-icing, anti-microbial materials which can have numerous applications in various sectors from the electronics, automobile, aircraft, construction and medical industries, to membrane filtration and water harvesting technologies, coating manufacturers and preservation of the cultural heritage. Extreme wettabilities, with very high or low static water contact angle and hysteresis, are typically observed on micro/nanoscale binary structured surfaces which can be found in nature, such as for instance, in the leaves of lotus and rice, in the petals of rose, in the feet of gecko and the feathers of duck.

In the last two decades enormous effort was devoted to understand the relationship between the natural binary structures and wettability and to fabricate artificial surfaces of extreme wetting properties thus mimicking nature and producing biomimetics surfaces. In this paper the relevant fundamental concepts and progress will be discussed and key strategies to achieve extreme wetting properties will be presented. Emphasis will be placed on superomniphobic coatings which can be deposited on large scale surfaces and can be therefore used for the protection and preservation of the cultural, including buildings of architectural charm and historical significance. The present investigation also encompasses evaluation of other properties of the multifunctional coatings such as, for instance, their durability and transparency.

### Speaker Biography

Ioannis Karapanagiotis is an Associate Professor of the Department of Management and Conservation of Ecclesiastical Cultural Heritage Objects, University Ecclesiastical Academy of Thessaloniki, Greece. He has obtained his Ph.D. in Materials Science and Engineering from The University of Minnesota, United States, and his Diploma in Chemical Engineering from the Aristotle University of Thessaloniki, Greece. His research interests are diverse ranging from wetting phenomena, interfacial engineering and nanomaterials to the development of novel methods for the protection/conservation of the cultural heritage and the characterization and analysis of cultural heritage materials which are found in historic monuments, paintings, icons, textiles, manuscripts. He serves as a member in Editorial Boards and reviewer in several journals (more than 90), and he has published multiple research papers (more than 140) in peer reviewed journals, books and conference proceedings.

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