Contribution ID: **118** Contribution code: **S14-PEHPP-212** Type: **Poster presentation**

Wetting and Roughness of Surfaces As Biomimetic Concepts in Teaching – A Proposal for Science Clubs

Monday, 29 August 2022 18:00 (1h 30m)

The world consists of millions of different living organisms. Through their huge diversity in terms of characteristics they have managed to live in all the possible extreme conditions in the planet that we live in. Every organism had millions of years to adapt to its environment and the results of this continuous evolution are there to be studied in order to benefit human lives through the field of Biomimetics. Both the science subject of biomimetics and the related field of nanotechnology are considered rapidly growing fields and their results help to considerably improve many parts of our lives.

In nature, many of the characteristics of living organisms are determined from the interaction between a surface (like the skin of an animal or the leaf of a plant) and water. Therefore, the study of the interaction between a solid surface and a fluid is a fundamental concept in the field of Biomimetics. The result of the interaction defines the wetting state, which in turn is defined by the characteristics of the surface. Biomimetics can be defined as a form of technology that uses or imitates nature to improve human lives. This is achieved by the study of physical phenomena (like the wetting state) and through their subsequent quantitative measurement (using units like contact angle and hysteresis angle). This research reveals the surface characteristics (like roughness and surface energy) which contribute to the phenomenon.

The central idea of the paper is that not only the integration of Biomimetics in secondary education is possible, but it is also a subject that can increase student interest. However, in order to achieve this aim, it is important to produce a content structure for instruction that originates from the scientific content, and it is concomitantly suitable for classroom implementation. In this study, the Model of Educational Reconstruction (MER) was used as a tool in order to clarify and analyze the scientific content. Through the core ideas of biomimicry, an attempt is made to design a content for instruction. The final goal is the construction of a teaching framework that can lay the groundwork for the integration of the subject in secondary education.

Acknowledgements The corresponding author acknowledges the Research Committee of Aristotle University of Thessaloniki (RC-AUTH) for the financial support of the participation in BPU11.

Primary authors: Mr STEFANIS, Michail (Didactics in Physics and Educational Technology, Aristotle University of Thessaloniki); Mrs TSIRIGOTI, Emmanouela (Didactics in Physics and Educational Technology, Aristotle University of Thessaloniki)

Co-author: Mr HATZIKRANIOTIS, Evripidis (Department of Physics, Aristotle University of Thessaloniki)

Presenters: Mr STEFANIS, Michail (Didactics in Physics and Educational Technology, Aristotle University of Thessaloniki); Mrs TSIRIGOTI, Emmanouela (Didactics in Physics and Educational Technology, Aristotle University of Thessaloniki)

Session Classification: Poster session

Track Classification: Scientific Sections: S14 Physics Education, History and Philosophy of Physics