

New ways of scientific publishing and accessing human knowledge inspired by transdisciplinary approaches to tribology

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Inspired by interdisciplinary work touching biology and microtribology, the authors propose a new, dynamic way of publishing research results, the establishment of a tree of knowledge and the localization of scientific articles on this tree.

The current two-dimensional standard of scientific publications is outdated. Over-information in almost any field is a problem. Therefore it is suggested that to succeed and be read, modern publications should be dynamic and use all types of multimedia. Such ways of presenting and managing research results would be accessible by people with different kinds of backgrounds and levels of education, and allow for full use of the ever-increasing number of scientific and technical publications.

This approach would dramatically change and revolutionize the way we are doing science, and contribute to overcoming the three gaps between the world of ideas, inventors, innovators and investors as introduced by Gebeshuber, Gruber and Drack in 2009 for accelerated scientific and technological breakthroughs to improve the human condition.

Inspiration for the development of above methods was the fact that generally tribologists and biologists do not see many overlaps of their professions. However, both deal with materials, structures and processes. Tribology is omnipresent in biology and many biological systems have impressive tribological properties. Tribologists can therefore get valuable input and inspiration from living systems. The aim of biomimetics is knowledge transfer from biology to technology and successful biomimetics in tribology needs collaboration between biologists and tribologists. Literature search shows that the number of papers regarding biotribology is steadily increasing. However, at the moment, most scientific papers of the other respective field are hard to access and hard to understand, in terms of concepts and specific wording, hindering successful collaboration and resulting in long times that are needed to speak and understand the other's language. For example, there is a plenitude of biology papers that deal with friction, adhesion, wear and lubrication that were written solely for a biology readership and that have high potential to serve as inspiration for tribology if they were available in a language or in an environment accessible for tribologists.

The three needs that can be identified regarding successful biomimetics for microtribologists (i.e. joint language, joint way of publishing results, and joint seminars, workshops and conferences) are developed further into a general concept concerning the future of scientific publications and ordering as well as accessing the knowledge of our time.

References

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Biography

Prof. Dr. Ille C. Gebeshuber is expert in Nanotechnology and Biomimetics, with habilitation in Experimental Physics from the Vienna University of Technology.

Since 2009 she has been Full Professor at the Institute of Microengineering and Nanoelectronics (IMEN), Universiti Kebangsaan Malaysia. Her permanent professorship affiliation is with the Vienna University of Technology.

She is co-founder of TU BIONIK, the TU Wien Center of Excellence for Biomimetics, editor-in-chief of a new UK-based Professional Engineering Publishing journal bridging engineering, culture and society, associate editor of the UK-based Journal of Mechanical Engineering Science, editorial board member of various scientific journals and co-Editor of a biomimetics book by Springer Scientific Publishing.

She is highly active in Science Outreach and in bridging Science and the Arts. Her research interests are located at the interface of biology, engineering and the arts, systems thinking and nanotechnology.