

## Biography

Prof. Ille C. Gebeshuber is a Professor of Physics from Austria, Europe. She is expert in Nanotechnology, Biomimetics and Tribology. Since 2009 she has been at the Institute of Microengineering and Nanoelectronics at Universiti Kebangsaan Malaysia. Her permanent position is at the Institute of Applied Physics at the Vienna University of Technology. Prof. Ille C. Gebeshuber is Associate Editor of the IMechE Journal of Mechanical Engineering Science (SAGE Publishing, London, UK) and Editorial Board Member of various scientific journals. Since 2011 she is Scientific Advisory Board Member regarding nanotechnology for the Lifeboat Foundation, a US American think tank safeguarding humanity. Her research interests comprise the use of nanotechnology and biomimetics to address global challenges for humankind.

Prof. Ille C. Gebeshuber serves on various international strategy boards. She has been acting as reviewer and advisor for agencies, universities, research institutions and public bodies. She is doing extensive public science outreach work and her professional activities are widely covered in the media.

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## **Towards a new type of science for successfully addressing the global challenges for humankind**

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Biomimetics research is facing a dual challenge: it has to learn from the natural environment and the requirements of people alike. The art is to build a bridge between the clever solutions life has developed over millions of years in its struggle for survival and the problems human engineers are facing in their struggle to develop new tools and applications. Here nature proves to be the greatest teacher. Frequent scientific expeditions to the deep rainforest can teach about sustainability, about elaborate materials, structures and processes.

Most scientists of our time are still specialists; they are very good in a tiny little area of their field. With the huge quantitative output of the science industry and interdependencies getting increasingly complex, a new type of scientist is needed to connect, evaluate and ultimately understand the complex issues modern science and technology are facing. To progress further, biomimetics requires interdisciplinary scientists, with a good general understanding of large-scale connections and structures, developments and trends, concepts and ideas. The successful addressing of global challenges needs people who can deal with interconnectedness and interdependence, across fields, across levels of education, across cultures.

Biography & Abstract for an Invited Lecture at “The 5th Workshop on Manufacturing Technologies for a Sustainable Society”, Theme: “Bio-inspired Nanostructures, Systems, and Manufacturing”. Suzhou Industrial Park (China), December 16, 2011.

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Albert Einstein once said “We can't solve problems by using the same kind of thinking we used when we created them.” Climate change, the increasing rich-poor gap, health issues arising from increasingly resistant microorganisms, transnational organized crime and global ethics are just some examples of global challenges that require a more comprehensive approach and that cannot be addressed by individual researchers who publish their valuable findings in isolated journals.

The inherent wisdom in Asia has an amazing potential; a successful combination with the “Western” approach to science might yield scientists and teachers who will focus on understanding, not on learning by heart. They will inspire their students to become more creative, and therefore provide them with the best basis to become the motors of change towards a better future for humanity.

The interaction between separate fields and mindsets has the potential to be mutually beneficial but will also need lots of efforts to overcome cultures differences and communication problems. The outcome of this process could be a new type of scientist who will have a deep understanding of the world around us, who has the resourcefulness to find new ways in arts, science and engineering and who develops a different approach to communicate the wonders of science and nature – contributing to a tree of knowledge that is accessible for all.