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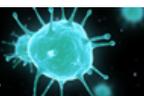
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P13-10 Metallic sheen without metals and colours without dyes: Towards a new, sustainable way of resource management via nanostructural colours

Metallic sheen without metals and colours without dyes: Towards a new, sustainable way of resource management via nanostructural colours

[Razman A.](#), [Diah S.Z.M.](#), [Karman S.](#), [Zobl S.](#) and [Gebeshuber I.C.](#)

Universiti Kebangsaan Malaysia, Universiti Malaya, Academy of Fine Arts Vienna & Vienna University of Technology, Austria

Our interdisciplinary research group comprises physicists (Azam Razman & Prof. Ille Gebeshuber), a biologist (Diah S.Z.M), an artist/ecologist (Sigrid Zobl) and an engineer (Salmah Karman). We work in the area of biomimetic nanoscience and nanotechnology: We learn from living nature for novel, more sustainable technology. For inspiration, we go to the rainforest, we talk, we read, we think. For more information, see Prof. Ille's TEDxKL

Talk „What is a physicist doing in the jungle? Biomimetics of the rainforest” at <http://www.tinyurl.com/lilleted> and Sigi Zobl’s presentation at dOCUMENTA13 in Kassel at <http://tinyurl.com/SZdOCU>

Additional Information: Zobl Sigrid, Ecologist and Artist

Phd student, Institute of Science and Technology in Art, Academy of Fine Arts in Vienna, Institute of Zoology Leopold Franzens University Innsbruck;

Abstract:

Mankind has been utilizing nanostructures to generate colours for many years. One great example is the colourful stained glass of medieval churches. In fact, we can say that the first nano-engineers among us were active in the medieval era! Even longer, plants, animals and microorganisms have been utilizing nanostructures in creating colours – some fossils of beetles still shine with all the colours of the rainbow, as they did when they were alive. The poster will demonstrate basic physical principles of colours generated by nanostructures exemplified by soap bubbles, CDs and colourful biological nanostructures from butterflies (e.g., *Trogonoptera brookiana*, the national Malaysian butterfly), beetle wings, shells, snake scales and Malaysian plants (e.g., *Selaginella uncinata*, *Diplazium tomentosum*, *Begonia pavonina*). Since the phenomenon of structural colouration is mainly structure dependent rather than material dependent, principle transfer to engineering is straightforward. One example where structural colouration has already reached the market are disposable, simple and cheap paper-based diagnostic kits in which antibodies induce interference colour change in thin film multilayers that can be identified with the naked eye. In animals and plants, the functions of metallic colouration based on structures are for example protection against light and dehydration, deterrence of predators and attraction of mates. In art and fashion, pop culture and Hollywood glamour, colourful, iridescent and metallic high reflection materials are used to glare and to impress. Be special, be remarkable, but not touchable. The poster will present first results of our interdisciplinary bioinspired approaches that shall yield structural coloration (including metallic effects) made from benign materials, providing exquisite function in combination with environmental sustainability.

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