

Characterization of structural colors

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Structural colors originate from the scattering of light from ordered microstructures, thin films, and even irregular arrays of electrically small particles, but are not produced by pigments. Structural colors can be implemented industrially to produce structurally colored paints, fabrics, cosmetics, and sensors. A brief description of the properties of structural colors, as well as examples of bio nanostructures which reflect linearly, or circularly polarized light are discussed along with methods of characterization of the structural coloration. The coloration polarization effects are explained with the physical mechanisms of light interaction with the building blocks, cellulose, guanine and reflectin, of these nanostructures and their optical properties.

Short biography:



Natalia Dushkina received M.S. in Quantum Electronics and Lasers from the University of Sofia, Bulgaria in 1993, and Ph.D. in Physics from the Bulgarian Academy of Sciences. She was a teacher in Optics at the High Technical School of Fine Mechanics and Optics in Sofia from 1984 to 1988, and a researcher at the Central Laboratory of Optical Storage and Processing of Information, Sofia in 1988 - 1995. In 1995, she came to Japan as a Monbusho postdoctoral research fellow at the Department of Physics, University of Tokyo, and remained in Japan for five years working as a researcher at the Mechanical Engineering Laboratory, MITI, Tsukuba, and at the Tokyo University of Agriculture and Technology. In August 2000, she relocated to the USA and worked as a visiting researcher at the Department of Physics and Astronomy, Bowling Green State University, Bowling Green, OH. In 2001 she became the Director of the Laboratory for Laser Applications at Gem City Engineering Co., Dayton, OH. At present, she is a professor at the Department of

Physics, Millersville University, PA, where she is working since 2004. She has co-authored one patent, one book, three chapters in professional books, 34 publications in refereed scientific journals and conference proceedings, more than 50 conference presentations and 15 seminars and workshops and has reviewed eight physics textbooks. Her areas of professional interests include structural colors; optics, optical properties of nanomaterials and semiconductors, lasers and laser applications, photorefractive effect, total internal reflection, and surface plasmon resonance, diffraction gratings, ultrafast nonlinear optical phenomena, holography; physics education and physics education research. She is a fellow member of American Physical Society (APS), Sigma Xi, The Scientific Research Society, American Association for the Advancement of Science (AAAS), Central Pennsylvania Section of the American Association of Physics Teachers (CPS-AAPT).