

Preface

This special issue reflects the activities at the Second Symposium on Structural Color, which was held on November 9–10, 2001 at Saitama University, cosponsored by The Society for Science on Form.

The peacock feathers, the stripes of Neon Tetra, the brilliancy of pearl, the electric blue wing of the Morpho butterfly; all these brilliant colors have structural origins and are called structural color. The history of the researches on the structural color started from the observations by Robert Hooke and Isaac Newton in 17th–18th century. The quantitative analysis using the electromagnetic theory progressed from the end of 19th century by famous physicists, Lord Rayleigh, Michelson and so on. At that time, the origin of the structural color was thought to be thin- or multi-layer interference and diffraction grating. With the development of the electron microscope, the surprisingly minute and complex structures were observed, which stimulated many biologists. They pursuit the surveying and classifying study on the structural colors in enormous creatures using microscopic observations and also pursuit the developmental and ecological study. However, the physical origins of the structural colors were somewhat left behind.

Recently the applications of structural color have been extensively growing in the painting, automobile, cosmetics and textile industries as materials gentle to the eyes and safe to the environment. Thus, the study to clarify the physical origins of the structural colors in a true sense is urgently needed.

This issue serves the state-of-the-art activities of the basic researches in Japan, which covers insects, fish, birds, and even in colloidal crystals. I am grateful if this issue makes all the readers feel meaningful and helpful.

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