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Editorial

The human fascination with color may be bound up with the observation that surfaces can be made to look like things they are not by the application of pigments, and that by alchemy new colors can be created by mixing different colors together. Moreover, color is important not only as a mimetic tool that enables us to represent surfaces and objects as they appear to us in nature, but also as a symbol. For example, the color of the pigment lapis lazuli was used in renaissance paintings both to represent the sky and the Virgin Mary's clothes, but it also indicated the wealth of the donor who commissioned the work: lapis was (and still is) expensive.

The papers of this special issue, solicited in response to the call Color: Cone Opponency and Beyond, reflect a resurgence of interest in understanding how the physical signals that are encoded by the photoreceptors are transformed from a trichromatic code to opponent codes that eventually lead to our perception of color. Many of the papers deal directly with cone-opponency, the antagonistic interactions between signals from different cone classes, observed both physiologically (Dacey, Peterson, Robinson & Gamlin, 2003) and psychophysically (Stockman & Brainard, 2010). Others of the papers are related to color-opponency, the fact that – in most normal viewing circumstances (but see Billock & Tsou, 2010) – certain hue do not co-occur .

Somehow the brain integrates information from spatial and temporal context, memory, even expectations and prejudices, to turn photoreceptor responses into the colors we perceive. The papers in this special issue explore the color distributions in nature to which our visual systems are presumably adapted. They investigate psychophysical properties including color saturation, color masking, color categorization, the interaction of shape and color, and high-level phenomenon such as color preferences. And they showcase attempts to understand these abilities in terms of the underlying neural mechanisms, by measuring the responses of neurons that carry color signals in the lateral geniculate nucleus and primary visual cortex. The overview article attempts to tie these diverse threads together (Conway, Eskew, Martin & Stockman, 2018). The research in these papers in the special issue point to a new era of color-vision research.

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Bevil R. Conway
National Eye Institute and National Institute of Mental Health, National Institutes of Health, Bethesda, MD 20892

Rhea T. Eskew, Jr
Department of Psychology, 125 Nightingale Hall, Northeastern University, Boston MA 02115, USA

Paul R. Martin
Save Sight Institute and School of Medical Sciences, The University of Sydney, Sydney, New South Wales, Australia

Andrew Stockman
UCL Institute of Ophthalmology, University College London, 11-43 Bath Street, London EC1V 9EL, England

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