

How We See in Color



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appointments in: Brain and Cognitive Sciences,
Biomedical Engineering, the Institute of Optics,
and Ophthalmology

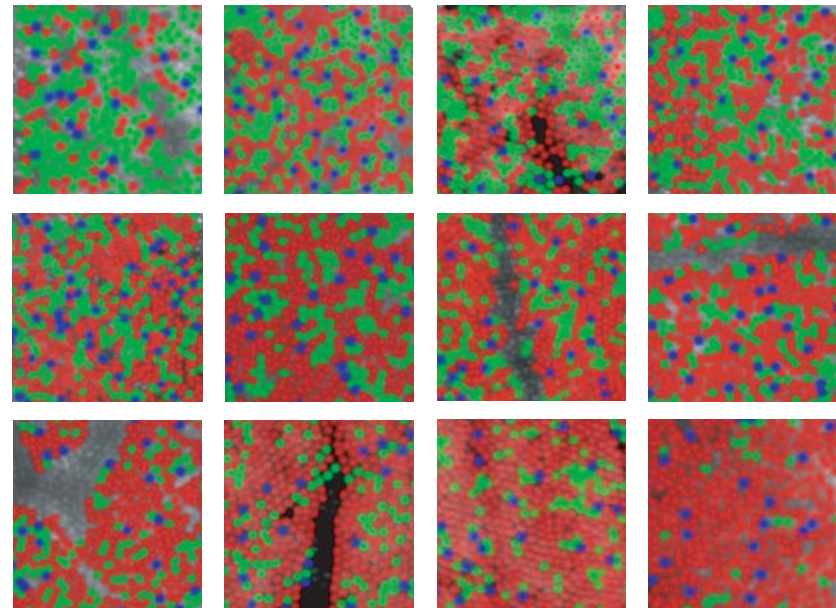
University of Rochester

PhD UCSD, 1979

Postdoc Bell Labs

U of R, 1981 -

This talk reviews the basic neurophysiology of color vision and through some simple demonstrations illustrates optical illusions that result. The causes and consequences of color blindness, and recent experiments that may provide a cure are described.



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Hofer et al., (*Neurosci*2005)

3:00 pm, Monday, January 28, 2008
Sloan Auditorium, Goergen Building
Refreshments following lecture

This colloquium is co-sponsored by:
Biomedical Engineering
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Abstract

The rich and varied perception of color we enjoy arises from signals from only three classes of cones in the retina, each with a different spectral absorptance. Neural machinery in the eye and brain transforms these three signals into spectral information about objects in the world that is remarkably robust despite large variation in the organization of the cone mosaic from point to point on the retina as well as large changes over time in the spectral irradiance of the illumination. Paradoxically, many well-known illusions of color perception, some of which I will demonstrate, are actually natural consequences of the neural machinery required for robust color vision. My lecture will also explain the causes and consequences of color blindness and recent experiments in genetic engineering that may provide a cure.

Biography

Williams received his BS from Denison University in 1975, his Ph.D. from the University of California, San Diego in 1979, and completed a postdoctoral fellowship at Bell Laboratories, Murray Hill in 1980. He joined the University of Rochester in 1981 where he has appointments in the departments of Brain and Cognitive Sciences, Biomedical Engineering, the Institute of Optics, and Ophthalmology. He is currently William G. Allyn Professor of Medical Optics. Since 1991, Williams has served as Director of Rochester's Center for Visual Science. Williams' research marshals optical technology to address questions about the fundamental limits of spatial and color vision. He is a Fellow of the Optical Society of America and the American Association for the Advancement of Science, received the OSA Edgar G. Tillyer Award in 1998, and the OSA Archie Mahan Prize in 2004. He is also the 2006 recipient of the Association for Research in Vision and Ophthalmology's Friedenwald Award and the 2007 recipient of the Bressler Prize from the Jewish Guild for the Blind.