

# **Seminar Talk**

**Prof. Arthur Shapiro  
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**Friday, January 30, 2015  
3:00 p.m. KH 224**

**Title:** Visual Illusions and Signal Processing

**Abstract:**

Many visual phenomena illustrate that the perceived appearance of a visual object depends on the context in which the object is presented. Explanations of such phenomena, however, concentrate on the color of the object while giving little attention to the perceived contrast of the object relative to the background. Here I will present a class of visual stimuli ("contrast asynchronies") that uses temporal phase to separate the perception of color from the perception of color contrast. My experiments with contrast asynchronies have led to a model of color vision that posits separate color and color contrast pathways, and to the creation of many dramatic visual demonstrations. I will show how this model suggests that many illusions can be accounted for by the reduction of blur, suggesting that brightness illusions arise because the parts of the visual system that encode brightness act like an adaptive high-pass filter that removes low spatial frequency content from the visual image.

**Bio:**

Professor Arthur Shapiro has won multiple international awards for the visual illusions that he has created, and is currently co-editing the Oxford Compendium of Visual Illusions. He conducts vision science research in the areas of color, motion perception, and low-light level vision. Shapiro did his undergraduate degree at U.C. San Diego (math and cognitive science), his Ph.D. at Columbia University, and post doc at University of Chicago. He is currently a Professor of Psychology and co-director of the Collaborative for Applied Perceptual Research and Innovation (CAPRI) at American University in Washington D.C.