1128-92-315 **Andrew M. Oster*** (aoster@ewu.edu) and **Paul C. Bressloff**. *Laminar Development of the Primary Visual Cortex.*

In this talk, we will introduce the architecture of the visual system in higher order primates and cats. Through activity-dependent plasticity mechanisms, the left and right eye streams segregate in the cortex in a stripe-like manner, resulting in a pattern called an ocular dominance map. We introduce a mathematical model to study how such a neural wiring pattern emerges and extend it to consider the joint development of the ocular dominance map with another feature of the visual system, the cytochrome oxidase (CO) blobs, which appear in the center of the ocular dominance stripes. Since cortex is in fact comprised of layers, we introduce a simple laminar model and perform a stability analysis of the wiring pattern. This intricate biological structure (ocular dominance stripes with 'blobs' periodically distributed in their centers) can be understood as occurring due to two Turing instabilities combined with the first-order dynamics of the system. We show recent numerical simulations showing how monocular deprivation during development can dramatically alter the ocular dominance pattern, while leaving the CO blob distribution nearly unaltered. (Received February 28, 2017)