1099-92-177 **Jennifer L Schei*** (jlschei@lanl.gov), **Garrett T Kenyon** and **John S George**.
Deciphering Retinal Encoding in Vision Processing.

As our eyes scan the surrounding environment, changes in luminosity and color sweep across the retina. Photoreceptors in the retina detect these changes in light and convey signals through the retina to the ganglion cells, which ultimately encode the information about spatial and temporal contrast and transmit it to the visual cortex via the optic nerve. Initial methods for analyzing signals from the retina investigated spike timing from individual retinal ganglion cells; such studies led to the recognition that the rate of neuronal spiking encodes the magnitude of the signal. However, more recent studies measuring the simultaneous activity of many neurons support the hypothesis that spatiotemporal correlations between cells contain more robust information about visual features than single cell spike trains. By analyzing correlations of spike events between neighboring cells, we show that higher spatial frequency features are encoded through spatiotemporal correlations compared to spiking rate, especially for moving stimuli. These results suggest that spatiotemporal correlations may help encode relationships between local features in visual stimuli. (Received February 07, 2014)