## 1046-34-1922 **Tyler Y Takeshita\*** (tylertak@gmail.com) and **Adrienne Amador** (lafloradesol@gmail.com). Circuit Approach to Modeling Neurons: New Dynamical Structures and Chaotic Behavior.

Motivated by Professor Bo Deng's work, a systematic circuit approach to modeling neurons with an ion pump is presented. Like Dr. Deng, the voltage-gated current channels of a neuron are modeled as conductors, the diffusion-induced current channels are modeled as negative resistors, and the one-way ion pumps are modeled as one-way inductors. This model differs from the well-known Hodgkin-Huxley model because it splits the active and the passive branches of each ion species where as the HH approach combines the electromagnetic, diffusive, and pump channels of each ion into one conductance channel. Our model maintains several of the known properties of HH models along with being rich in many new dynamical structures including chaotic behavior. (Received September 16, 2008)