1145-49-2932 **Tiziana Giorgi**, **Sookyung Joo** and **Lidia Mrad*** (lmrad@math.arizona.edu). *Switching Dynamics in Liquid Crystals.*

One of the important applications of liquid crystal materials is their use in optical and display devices. There are several phases of liquid crystals, some of which promise more efficient and less expensive optical devices than others. A recently discovered phase is made up of bow-shaped molecules, a characteristic that endows them with spontaneous ferroelectricity. Under the effect of an applied electric field, two competing mechanisms of switching can be detected in the tilted structure of these materials. To understand which mechanism emerges under certain physical conditions, one can carry out dynamical analysis starting with a free energy and constructing a gradient flow. The challenge in writing the corresponding weak Euler-Lagrange equations is the orthogonality constraint on the two variables of the model. We illustrate how this challenge can be overcome and explain how the continuous gradient flow can be obtained from the discrete-in-time one. (Received September 25, 2018)