

Meeting: 1002, Pittsburgh, Pennsylvania, SS 13A, Special Session on Mathematical Biology

1002-92-61 **Rebecca Ellison, Virginia Gardner, Joel Lepak, Meghan O'Malley and Joseph Paullet***
(jep7@psu.edu), School of Science, Penn State Erie, Erie, PA 16563, and **Joseph Previte, Beth Ann Reid and Katy Vizzard.** *Pattern Formation in Small Arrays of Locally Coupled Oscillators.*

We investigate small two-dimensional arrays of locally coupled phase oscillators which are shown to exhibit a surprising variety of stable structures including: single spiral waves, spiral pairs and spirals with secondary periodic core motion. This periodic core motion is not the core meander familiar to many models of active media, but is in fact induced by the boundary of the small domain. Such boundary motion was investigated by Sepulchre and Babloyantz [1993] for the complex Ginzburg-Landau equation and for the Brusselator model in a relaxation oscillation parameter regime. The current model confirms their findings and sheds new light on the origin of such motion. The model also exhibits other patterns, as well as a chaotic regime. We discuss the transition between patterns as the form of the coupling is changed as well as implications for pattern formation in general oscillatory media. (Received August 17, 2004)