

Applied Dynamical Systems Seminar

**Dr. Etienne Farcot,
(INRIA Sophia Antipolis Mediterranee in the Virtual Plants team, France)**

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4:00pm-5:00pm, HH-3013**

Patterns Induced by Active Transport in Cellular Tissues

Abstract:

In this work, we consider a typical model of transport of a substance in a cellular tissue, where transporter molecules accumulate on the boundaries of cells in function of the local flux of the substance between adjacent cells. The origin of such models is the study of organ arrangements in plants, also called phyllotaxis. It is known that the regular patterns of phyllotaxis depend strongly on the active transport of auxin, a plant hormone. Computer simulations have shown that several variants of this active transport mechanism can lead to realistic phyllotactic patterns. However, very few is known about the general patterning abilities of this model. As a first step, we will present some results on existence and stability of steady states with homogeneous auxin distribution. A particular focus will be put on tissues having the shape of a ring of cells.