1014-37-1049 **Adela Nicoleta Comanici*** (adela@math.uh.edu), University of Houston, Department of Mathematics, 651 Philip G. Hoffman Hall, Houston, TX 77204-3008, and **Martin Golubitsky**, University of Houston, Department of Mathematics, 651 Philip G. Hoffman Hall, 77204-3008 Houston, TX, Afghanistan. *Turing patterns on growing square domains.*

Turing patterns on static domains are examples of spontaneous symmetry breaking patterns from an invariant equilibrium. Because these patterns are sensitive to size and geometry of the domain, boundary and initial conditions, as well as variation of parameters, numerical simulations of Turing patterns in reaction-diffusion systems on growing square domains with Neumann boundary conditions were undergone.

In this talk, I will consider a reaction-diffusion system on an isotropically growing square domain, having a trivial homogeneous equilibrium that undergoes a Turing instability and present what transitions from equilibrium to a patterned state might happen. Two points are involved: *hidden symmetries* due to Neumann boundary conditions and *symmetry-breaking bifurcations* on the square lattices. I will show how the reduction to the study of $(2,0)$ and $(2,2)$ mode interactions for bifurcation problem with D_4+T^2 symmetry can explain some of the numerical simulations. For example, it is surprising that transitions from squares to stripes can occur via periodic solutions. The main tools are the equivariant bifurcation theory and Liapunov-Schmidt reduction. (Received September 27, 2005)