

# Special Topics in Biological Dynamics

APC 591, Fall 2001

Meets:

Tuesdays, Thursdays, 2:40–4:00PM, starting Sept. 13  
Lewis Thomas Laboratory Rm. 118

computer labs to be scheduled

Topics to be covered:

Intracellular Chemical Networks

W. S. Bialek, Dept. of Physics

Biological Pattern Formation

E. C. Cox, Dept. of Molecular Biology

Dynamics of Disease

S. A. Levin, Dept. of Ecology and Evolutionary Biology

Models of Action Potentials and Simple Neural Circuits

D. W. Tank, Depts. of Molecular Biology and Physics

There will also be several guest lecturers, including:

J. J. Hopfield, Dept. of Molecular Biology

S. Y. Shvartsman, Dept. of Chemical Engineering

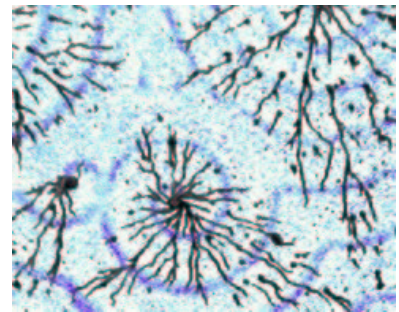
M. A. Nowak, Program in Theoretical Biology, Institute for Advanced Study

J. G. Dushoff, Dept. of Ecology and Evolutionary Biology

A preparation in mathematics, including integral calculus, differential equations, and linear algebra is expected, as is some experience in using mathematics to model the real world. Graduate students with undergraduate majors or minors in physics, biophysics, mathematics (pure or applied), engineering, and evolutionary biology will have such backgrounds, as will Princeton seniors with these or similar majors. Much of the material is best explored through computer simulations, and problem sets on these subjects are an important component of the course. Instruction and help will be available in a computer simulation laboratory. Previous experience with computers is not essential, but the student will need to learn some useful aspects of Matlab and other programs for scientific computation.

For more information, visit: <http://www.eeb.princeton.edu/~slevin/BWF/BWFIntro.html>  
or email Jeff Moehlis, Course TA, at [jmoehlis@math.princeton.edu](mailto:jmoehlis@math.princeton.edu)

The course is coordinated by J. J. Hopfield, Dept. of Molecular Biology.



Randomly dispersed Dictyostelium amoebae self-organize and propagate spiral waves of the chemoattractant cAMP. Courtesy E. C. Cox.