

COLLOQUIUM
UNIVERSITY OF PITTSBURGH
THURSDAY, JANUARY 4, 2007
704 THACKERAY HALL
3:00 P.M.

SPEAKER: PROFESSOR HUIQIANG JIANG*

**SCHOOL OF MATHEMATICS
UNIVERSITY OF MINNESOTA**

**TITLE: ANALYSIS ON AN ACTIVATOR-INHIBITOR SYSTEM:
GLOBAL SOLUTIONS & STEADY STATES**

ABSTRACT: We consider the Gierer-Meinhardt system

$$\left\{ \begin{array}{l} u_t = d_1 \Delta u - u + \frac{u^p}{v^q} + \sigma \text{ in } \Omega \times [0, T), \\ \tau v_t = d_2 \Delta v - v + \frac{u^r}{v^s} \text{ in } \Omega \times [0, T), \\ \frac{\partial u}{\partial \nu} = \frac{\partial v}{\partial \nu} = 0 \text{ on } \partial\Omega \times [0, T) \end{array} \right.$$

where Ω is a bounded smooth domain in \mathbb{R}^n , $n \geq 1$ and ν is the unit outer normal to $\partial\Omega$. Here u, v represent respectively the concentrations of two substances, activator and inhibitor, with diffusion rates d_1, d_2 . The source term σ is a nonnegative constant representing the production of the activator, $\tau > 0$ is the response rate of v to the change of u , and the exponents p, q, r, s are nonnegative numbers satisfying the condition

$$0 < \frac{p-1}{r} < \frac{q}{s+1}.$$

We will discuss past achievements on this system and present new results on existence of global solutions as well as existence and nonexistence of nontrivial steady states.

**Refreshments served at 2:30 p.m.
in the Math Dept. COMMON ROOM, Thackeray 705**

*The speaker is a candidate for a position in the Department.