



**Department of Mathematics and Statistics**

**COLLOQUIUM**

**Tuesday, March 1<sup>st</sup>, 2015**

4:00 – 5:00 pm, Adel Mathematics Bldg., Room 164  
(refreshments at 3:45)

**Tracy Stepien**

ASU

Visiting Assistant Professor

## **Cell Migration: Modeling, Simulation, and Analysis**

**Abstract:** Collective cell migration plays a substantial role in maintaining the cohesion of cell layers in the context of wound healing, embryonic development, and the progression of cancer. Disruption of cell migration can cause diseases such as necrotizing enterocolitis, an intestinal inflammatory disease that is a major cause of death in premature infants. We extend a mathematical model of cell layer migration during experimental necrotizing enterocolitis based on an assumption of elastic deformation of the cell layer that leads to a generalized Stefan problem. Analysis and numerical results indicate that a large class of constitutive equations for the dependence of cell proliferation on stretch leads to traveling wave solutions with constant wave speed. In the case where there is no cell proliferation, we prove the existence and uniqueness of similarity under scaling solutions using Wazewski's Principle.

Algebra Combinatorics Geometry and Topology (ACGT) Seminar meets Tuesdays, 12:45 – 2:00 pm, AMB 164.  
Applied Math Seminar (AMS) meets Thursdays 12:45 – 1:45 pm, AMB 164.

Shafiu Jibrin speaks this Thursday March 3<sup>rd</sup>.

Friday Afternoon Undergraduate Mathematics Seminar (FAMUS) meets Fridays, 3pm, AMB 164.