Joint AU-AUM Colloquium

AUM Math Club
Friday, November 30, 2018
201 Goodwyn hall
12:30 PM Pizza and refreshments
1:00 PM Presentation

Krystyna Kuperberg, Auburn University
"Fixed points, periodic orbits, and flows"

ABSTRACT: A SPACE X HAS THE FIXED POINT PROPERTY IF EVERY CONTINUOUS FUNCTION $f: X \to X$ HAS A FIXED POINT $x_0 = f(x_0)$. IF THE FUNCTION IS GIVEN BY A VECTOR FIELD, THE FIXED POINTS CORRESPOND TO ZERO VECTORS. THE WELL KNOWN HAIRY-BALL THEOREM ASSERTS THAT ON THE 2-DIMENSIONAL SPHERE EVERY CONTINUOUS VECTOR FIELD VANISHES AT LEAST ONE POINT. THIS IS NOT TRUE IN DIMENSION THREE, BUT H. SEIFERT PROVED THAT IF THE VECTORS ARE ALMOST PARALLEL TO THE BIG CIRCLES ON THE 3-DIMENSIONAL SPHERE, THAN THERE EXIST AT LEAST ONE SIMPLE CLOSED CURVE TO WHICH THE VECTOR FIELD IS TANGENT. WE WILL DISCUSS WHY THIS IS NOT TRUE IN GENERAL.

Open and free to all AUM students and faculty