


Mathematics at The University of Tennessee

THE UNIVERSITY OF
TENNESSEE
KNOXVILLE 
DEPARTMENT OF MATHEMATICS



Our Department

- » Faculty
- » Our faculty are composed of 38 tenure / tenure-track faculty, 3 postdoctoral associates, and 31 lecturers.
- » Graduate Students
- » We currently have 100 full & part-time graduate students enrolled in our MS and PhD programs.

Annual Math Dept Picnic



Graduate Degree Programs

Masters & Ph.D.

» Doctor of Philosophy -- PhD

- + for students who are interested in teaching and/or research at 4-year and graduate level universities or industry.

» Master of Science -- MS

- + for students interested in a career in industry or teaching at the community college level.

» Master of Mathematics -- MM

- + for students who would like to teach in the high school or community college setting. This is an online program only.



University of Tennessee Intercollegiate Graduate Minors or Master of Science

- » Minor or MS in Statistics
- » Minor in Computational Science
- » Earn additional minor or MS while also earning your degree in mathematics



Research Areas

UT offers a broad range of courses and areas of study

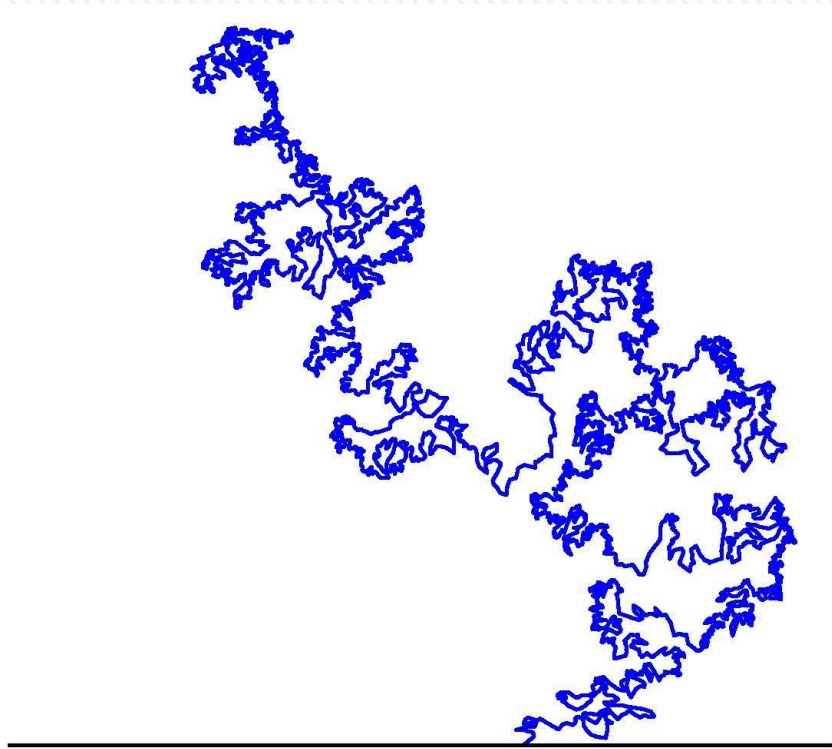
Algebraic Geometry
Commutative Algebra
Complex Analysis
Computational Math &
Modeling
Continuum Mechanics
Data Science
Differential Geometry
Geometric Analysis

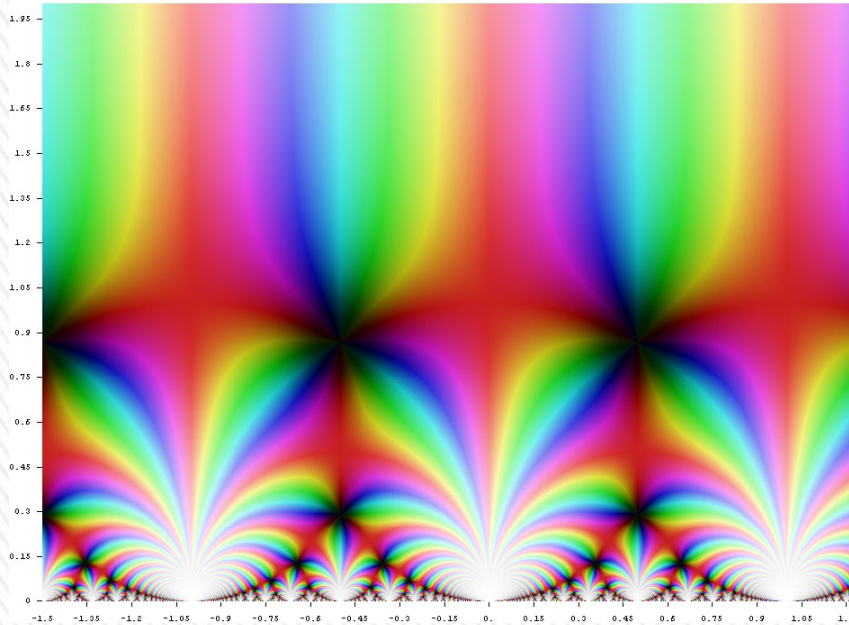
Geometric Topology
Mathematical Ecology/Biology
Number Theory
Numerical Differential Equations
Operator Theory
Partial Differential Equations
Probability & Stochastic
Processes
Stochastic Differential Equations



Growing Random Fractals

- » With the aid of the Loewner differential equation which dynamically generates growing sets, Professor Joan Lind analyzes 2-dim curves, including random fractal curves. This provides deep connections between analysis, probability, and statistical physics.





Modular forms are holomorphic functions on the upper half of the complex plane which satisfy a symmetry property under the action of the modular group. These functions are central objects of study in number theory and have deep connections to many other areas of research, including combinatorics, arithmetic geometry, sphere packing, and string theory.

Dr. Marie Jameson

The Beauty of Mathematical Symmetry



Financial Support & Awards

- » Teaching Assistantships include stipend, tuition waiver, and health insurance
- » Research Assistantships and University Fellowships are available
- » Fellowship awards are given each year as a monetary supplement to your standard award



» Army Grant Supports Machine Learning Research

Dr. Vasileios Maroulas is developing a method that employs artificial intelligence to clearly understand the electrical brain activity data conveyed through electroencephalogram monitoring.



The *Brain-Computer Interface* project aims to develop technologies for recording brain activity and establish computational methods to translate the signals into computer-executable commands. Using Maroulas's method, Army researchers hope to harness the complex information collected from a soldier's neuroimaging data.

Artificial Intelligence



Bears & Mathematics?



Dr. Rene' Salinas – Ph.D.

Mathematical Ecology

Spatial Control (determining the when, where, and how much in population management) presents complex problems that can only be solved with mathematics. In my work, I used coupled differential equations and an individual-based model (IBM) to determine the optimal management strategy for the black bear population of Eastern Tennessee and western North Carolina.



Employment

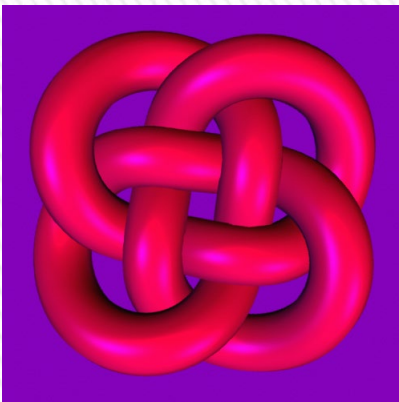
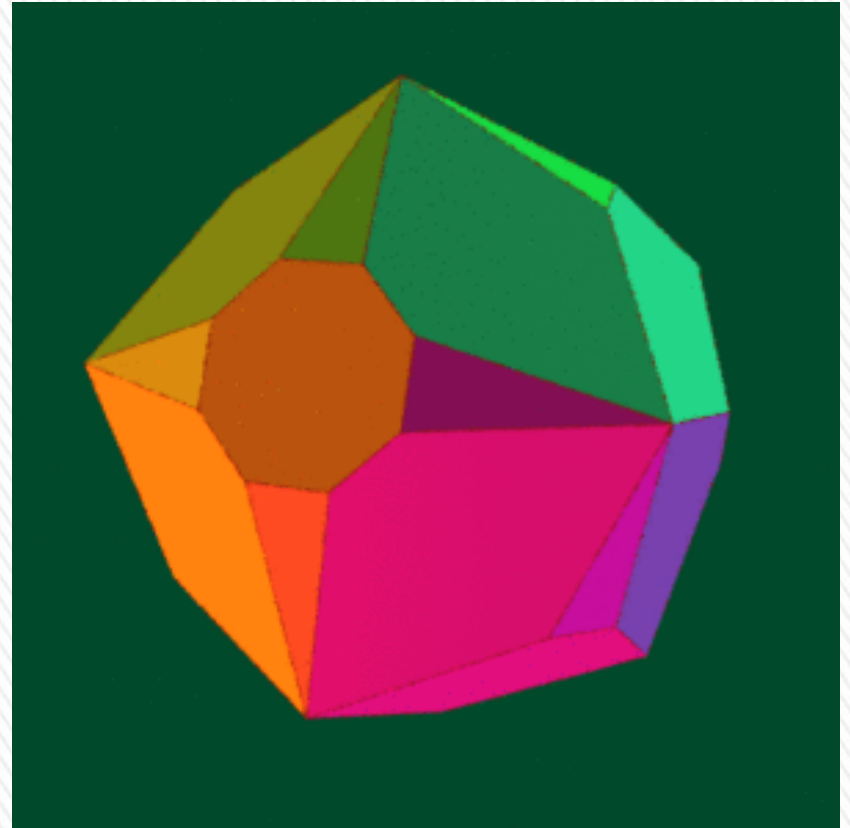
- » Many of our PhD graduates obtain tenure-track or postdoctoral academic positions. Others have started careers within the computer industry, financial and government agencies, as well as consulting firms.
- » Masters students have successfully found diverse employment in teaching, various community and 4-year colleges, and industry & government agencies.



“Knot” just another pretty picture...

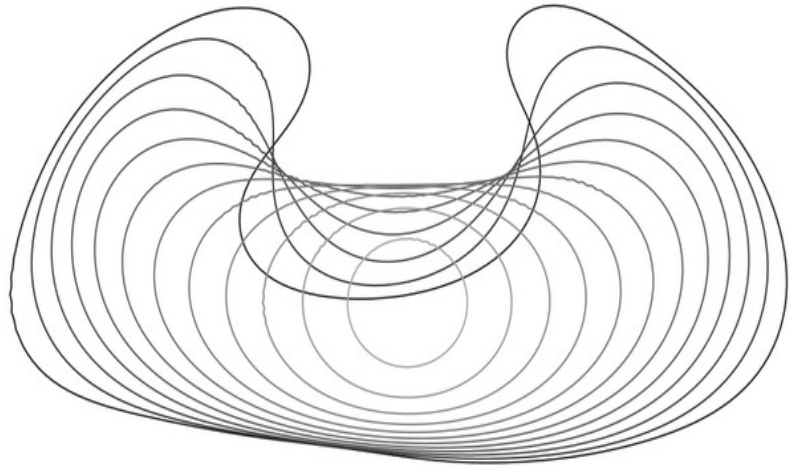
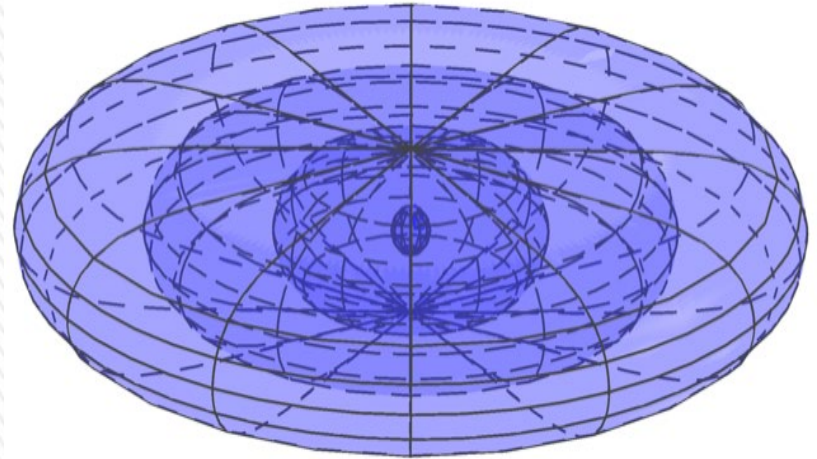
Dr. Morwen Thistlethwaite

If we remove the vertices of this polyhedron and then glue opposite faces together, we obtain the complement of the Turk's head knot (like the one below) in 3-dimensional space. Also, copies of the polyhedron can be used to tile 3-dimensional hyperbolic space.



Geometric Analysis

Dr. Theodora Bourni and Dr. Mat Langford investigate the motion of curves and surfaces driven by curvature.



- » “Ancient pancakes” are special solutions to mean curvature flow which show that singularities may be nastier than expected.

“Curve shortening” makes simple closed curves round.



Oak Ridge National Lab

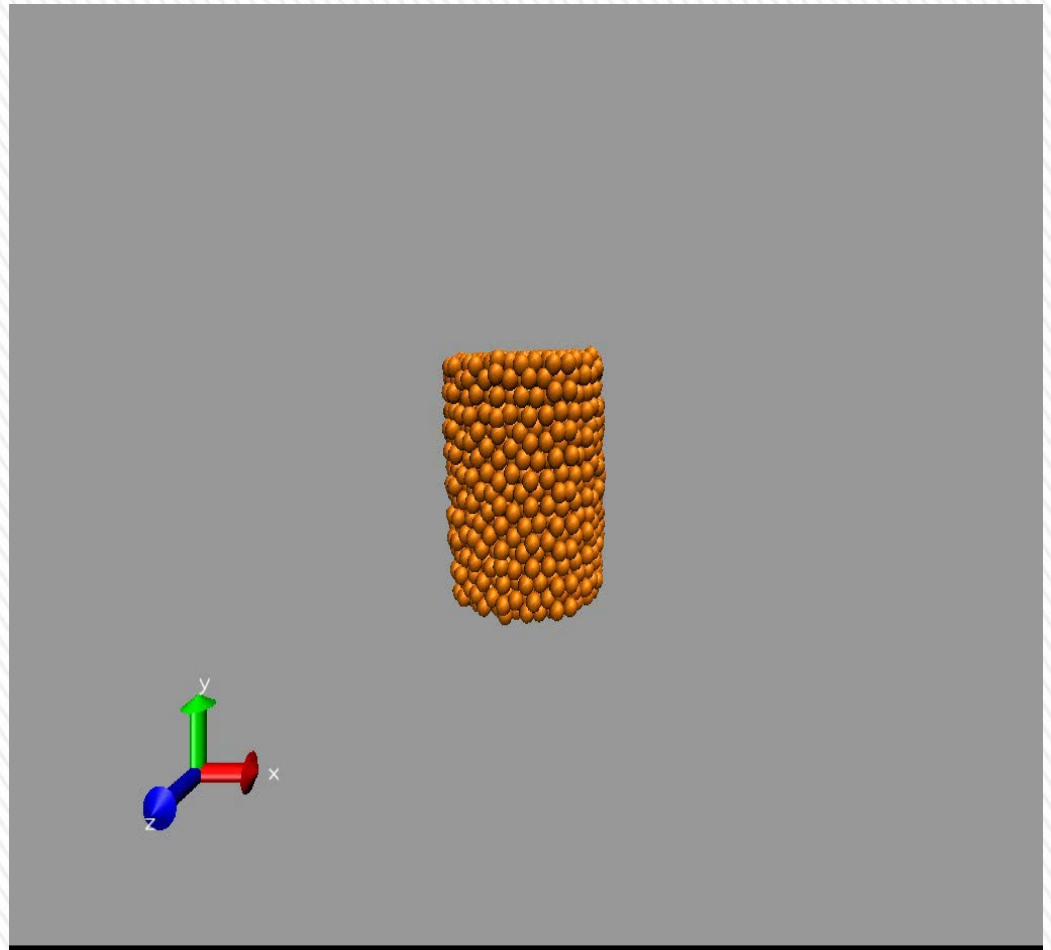
- » Close faculty interaction with Oak Ridge National Lab
- » Resources for groundbreaking research
- » Opportunities for summer internships
- » Post-doctoral research positions



Nanotech

Dr. Tim Schulze – Applied Mathematics

This is a simulation of a gold nanowire built out of a few hundred atoms being stretched until it breaks. As devices become smaller and smaller there is an increasing need for computational methods that simulate atomic scale objects.



Teaching Opportunities and Mentoring Program

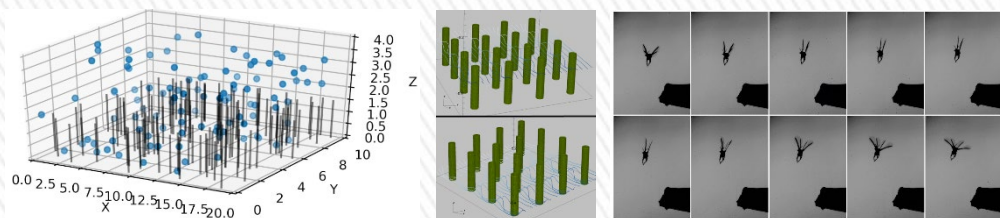
- » Gain valuable experience managing your own class
- » Opportunity to teach a variety of lower division courses
- » Faculty and graduate student teaching mentors
- » Teaching Assistantships offer practical experience in the classroom and prepare you for future opportunities



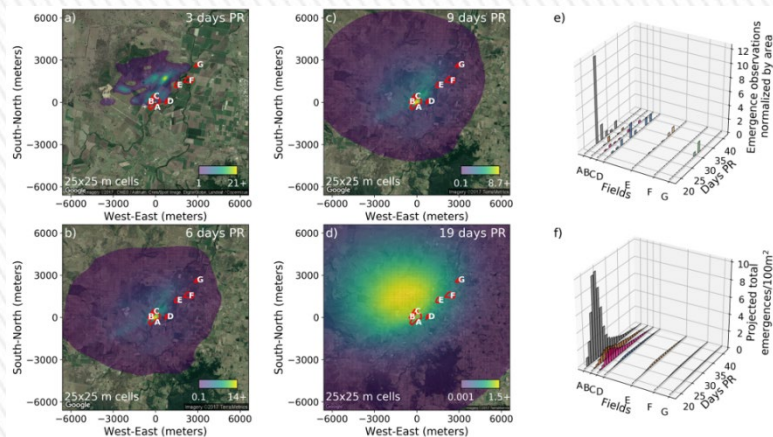
The Mathematics of Organismal Behavior, Movement, and Addiction Dynamics

- Multi-scale mathematical/probabilistic modeling
- Individual-level population-level patterns
- Population & dispersal dynamics
- Mathematical epidemiology
- Complex systems, data-driven mathematics

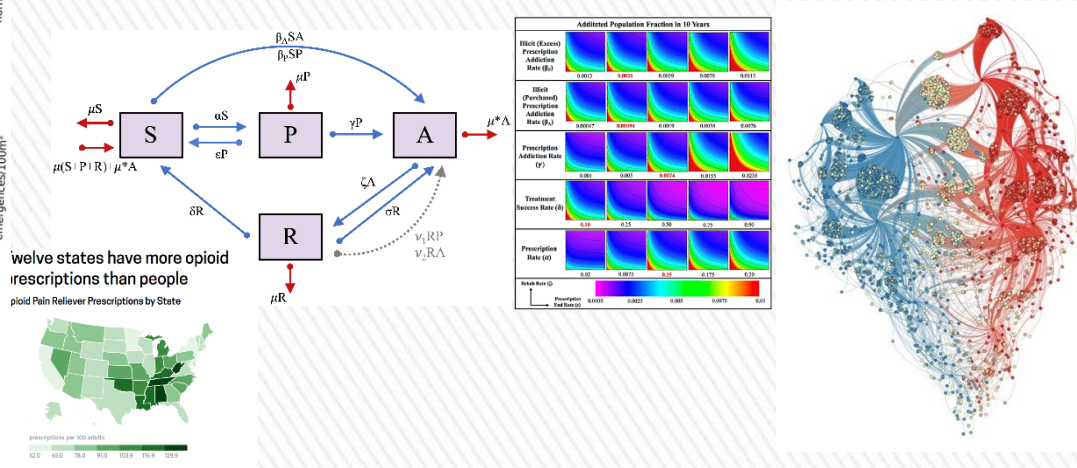
Spread of parasitoids



» Dr. Christopher Strickland
 » cstric12@utk.edu



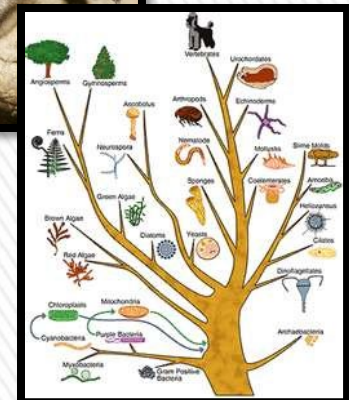
The opioid epidemic



Research Highlights

- Disease, ecological and evolutionary modeling
- High performance computing applications

www.nimbios.org





- » Located on the campus of the University of Tennessee, NIMBioS is major initiative to foster interdisciplinary research at the interface between the mathematical and biological sciences
- » Diverse researchers from around the world offer workshops, seminars, and scientific collaboration
- » Summer Research Experience for Undergraduates Program
- » www.nimbios.org



QS World Ranking of Mathematics Departments

» Ranked **26th**
among public
universities in
the US.

<https://www.topuniversities.com/university-rankings/university-subject-rankings/2021/mathematics>

» Ranked equally with Arizona State, NC State, Un of Florida, UI-Chicago, and Virginia. Ranked higher than CUNY, Florida State, Un of Arizona, Un of Iowa, UMass-Amherst, Un of Utah, Un of Georgia, Un of Connecticut, Emory, and RPI.



Location, Location, Location - Knoxville, Tennessee



- » Located in the Tennessee River Valley between the Great Smoky and Cumberland Mountains, Knoxville offers a combination of outdoor activities, spectator sports, and water recreation as well as cultural attractions. A low cost of living is perhaps one of the biggest bonuses of this culturally diverse area.



For More Information on Math Graduate Studies at UT

» If you would like more information about our program, please ask the representative who is here today, or contact us at one of the addresses below.

> *E-mail:* mathgradprogram@utk.edu

> *Web:* <http://math.utk.edu/>

> *Postal Service:* Graduate Program
Department of Mathematics
University of Tennessee
Knoxville, TN 37996 USA

> *Phone:* 865-974-2464

