D. Michael Senter

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Education

University of North Carolina at Chapel Hill — **Chapel Hill**
Mathematics PhD (anticipated) — *2015–2020*

University of Utah — **Salt Lake City**
Mathematics B.S. — *2012–2015*

Experience

Academic

UNC Chapel Hill — **Chapel Hill**
Miller Lab Group - Member — *2015–Present*
The flight of smallest insects is not yet fully understood. Some insects whose flight regimen is in the intermediate Reynolds number world have developed bristled wings as an adaptation to their environment. Using thrips as model organism, I am investigating fluid dynamic properties of their flight. In particular, I am working on a two dimensional model of thrips parachuting. As part of my work I am also developing software to automatically creatte meshes of geometries for use with IBAMR and IB2d.

SAMSI — **Chapel Hill**
Neuromechanics Working Group — *2015–2016*
An important component of locomotion is sensing the environment and controlling movement accordingly. In most animals, the nervous system is a fundamental component of actuating movement. In addition to the nervous system, the execution of coordinated movements depends upon the interaction of the sensing organs, motor pattern generators, and muscle. To accurately describe maneuvering and motor control in animals, an integrated model of all of these components is required. Physical models range from relatively simple systems of phase oscillators driving inverted pendulums to more detailed models that couple central pattern generators, muscle activation, force generation, and the resulting motion through a complex environment. Network analysis provides tools for unraveling the complexity of sensory feedback and locomotor control when physical models are challenging or intractable. Network approaches have proven to be extremely valuable when looking at the collective behavior of animals. In this working group, we will apply both approaches to understand neuromuscular control and collector behavior individual and groups of organisms.

University of Utah — **Salt Lake City**
Mathematics Department REU — *2013–2015*
Modeling the motion of passive particles in a viscous fluid is well studied and understood. Extensions to passive motion in a complex fluid which exhibits both viscous and elastic properties have been developed in recent years. However, questions remain on the characterization of mean-square displacement and mean first passage for different theoretical models. We developed a statistically exact covariance based algorithm implemented in parallel C++ to generate particle paths to answer these questions. Advised by Dr. Christel Hohenegger. Supported by NSF DMS-1413378 from September 2014 through May 2015.

Teaching

MATH 232 - Calculus II — **UNC-CH**
Recitation Instructor (anticipated) — *Fall 2017*

MATH 564 - Math Modeling in the Life Sciences — **UNC-CH**
Teaching Assistant — *Fall 2016*

MATH 110 - College Algebra — **UNC-CH (Friday Education Center)**
Instructor on Record — *Summer 2016*

MATH 232 - Calculus II — **UNC-CH**
Recitation Instructor — *Spring 2016*

MATH 231 - Calculus I — **UNC-CH**
Recitation Instructor — *Fall 2015*

MATH 566 - Introduction to Numerical Analysis — **UNC-CH**
Grader — *Fall 2015*

Other Involvement

UNC Chapel Hill — **Chapel Hill**
AMS Graduate Student Chapter Secretary — *2016–2017*

University of Utah — **Salt Lake City**
SIAM Student Chapter Secretary — *2014–2015*

Talks and Presentations

SIAM CSE15: Undergraduate Research Symposium, March 2015

University of Utah Undergraduate Research Symposium: Math department REU symposium, Fall 2013, Spring & Fall 2014

Poster Presentations

SMB General Meeting 2017: "MeshmerizeMe".

Utah Math Bio Alumni Conference 2017: "MeshmerizeMe".

BAMM! 2017: "Aerodynamics of parachuting in tiny insects".

Tulane Winter Workshop on Neuromechanics 2017: "Aerodynamics of parachuting in tiny insects".

FACM 2016: "A Model of Muscle Response to Neuronal Spike Activity."

University of Utah Science Day: Poster Presentation, Fall 2014

Undergraduate Mentoring Experience

Kristin Armel: Chemisty and Psychology Major, Fall 2016 to Present. Parachuting thrips project.