



## FINAL SCHEDULE

# 2011 NHLBI-VCU-W&M World Conference on Mathematical Modeling and Computer Simulation in Cardiovascular & Cardiopulmonary Dynamics

NHLBI T15 Grant to Virginia Commonwealth University  
Conference Hosted at the College of William & Mary  
Williamsburg, Virginia

31 May 2011 – 3 June 2011

<http://www.vcu.edu/csbc/nhlbi/world11/index.html>

**TUESDAY 31 MAY 2011**

**PARALLEL WORKSHOP DESCRIPTIONS**

- 1) **Studying Cardiovascular and Cardiopulmonary Systems Using *Mathematica*:** This is a two-part workshop for Life Scientists that will be held on Tuesday 31 June 2011, prior to the start of the conference. This two-part workshop will provide an introduction to topics covered by invited speakers at the conference, and will use *Mathematica* to illustrate quantitative calculation, simulation, and visualization. The morning session will concentrate on using statistical methods for the analysis of cardiac signals and will include implementation of methods such as detrended fluctuation analysis and multiscale entropy. The afternoon session will address modeling of the effects of calcium binding on cardiac myofilaments. This will use simple models from work by John Jeremy Rice and will employ differential equation modeling as well as Monte Carlo simulation methods. An introduction to the programming language *Mathematica* will be included in both workshop components. This two-part workshop should be suitable for beginning researchers and for others who may wish to enhance the quantitative aspects of their ongoing research. The workshop leaders will be Marilyn F. Bishop and Tom McMullen from the Department of Physics and the Center for Biological Complexity at Virginia Commonwealth University.
  
- 2) **Mathematics and the Heart for Highschool Teachers:** This is an all day workshop for current and prospective Mathematics and Science highschool teachers. In this workshop we will present high school teachers with a variety of simple mathematical and biological concepts so that they might develop very simple mathematical models describing cardiovascular (heart) or cardiopulmonary (heart & lung) properties. Workshop participants will be able to value the importance of mathematical modeling in understanding some aspects of biology in general and of the heart dynamics in particular. Participants will be motivated to develop innovative instructional modules linking biology and mathematics. Participants will learn about the heart from both, the biological and the mathematical point of view. We will focus on several properties of the heart and lung such as, excitability, arrhythmia and gas exchange. These models will be such that they can be meaningfully explained to high school students with a minimum of both medical knowledge and mathematical background. The workshop leaders will be Amina Eladdadi from the Department of Mathematics, College of St. Rose and Jyoti Champanerkar from the Department of Mathematics, William Patterson University. The afternoon portion of the workshop will include a guest lecture by Jeremy Rice from IBM Corporation. Individuals who complete the workshop will receive attendance letters certifying that they attended the workshop.