

## Scientific Computing

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## CBC and CCI Workshop on Cardiac Modelling - November 5-7, 2014

**On Nov 6th - 7th, Simula is hosting a workshop on Cardiac Modelling, where local researchers and international experts will present their research across a variety of topics related to mathematical models of the heart.**

Total number of participants: 39  
 Total number of guests outside of CBC: 21  
 Number of different nationalities represented: 8  
 Total number of speakers: 24  
 Total number of talks: 24

### Registration

We would like to invite interested parties to join us for the scientific sessions. The schedule of sessions and talks are attached, and if you would like to join for any of the talks, please register using [this form](#) or send an email to [alisa@simula.no](mailto:alisa@simula.no).

## Program

### Wednesday – Nov 5th

18.00 Welcome Reception at Simula

### Thursday – Nov 6th

#### 8.30 – 8.45 Opening Remarks

#### 8.45 – 10.45 Session 1: Investigation into Atrial Dynamics

Edward Vigmond – University of Bordeaux: Computing Phase from the heart to the torso during atrial fibrillation

Javier Saiz – Polytechnical University of Valencia: Computational 3D model of human atria – Applications to the study of atrial arrhythmias

Axel Loewe – Karlsruhe Institute of Technology: Multi-scale modeling of human atrial patho-electrophysiology: genetic defects and pharmacological agents

Jussi Koivumäki – Simula Research Laboratory: Computational models of cardiac electrophysiology in healthy and fibrillating human atria

10.45 – 11.00 Coffee Break

#### 11.00 - 12.30 Session 2: Molecular and subcellular dynamics

Bill Louch – University of Oslo: Cardiomyocyte dyadic structure/function in health and disease

Thomas O'Hara – Johns Hopkins University: Caveolin-3, T-tubule integrity, and PKA phosphorylation of L-Type Ca channels

Glenn Lines – Simula Research Laboratory: Estimating Markov Models for ion channels based on the dynamics of the transmembrane potential

12.30 - 13.30 Lunch

#### 13.30 -15.30 Session 3: Models of cardiac disease

Eleonora Grandi – University of Bologna: Arrhythmogenic crosstalk and feedback of Ca, Na, CaMKII, and adrenergic signaling in cardiac disease

Beatriz Trenor – Poly technical University of Valencia: Electrophysiological and structural remodeling in heart failure modulate arrhythmogenesis – Simulation insights

Namit Gaur – Simula Research Laboratory: Mechanistic basis and targets for therapy in CPVT: a simulation study in a human heart cell

Mark Potse – University of Bordeaux: Computer modeling to understand the failing heart

15.30 – 15.45 Coffee Break

#### 15.45 – 17.15 Session 4: Electrophysiology

Sergio Alonso – Poly technic University of Catalonia: Percolation threshold of regular grids and relation with anatomical reentry in cardiac tissue.

Rodrigo Weber dos Santos – Federal University of Juiz de Fora: Maze flutter: reentry arising from microstructural discontinuities of cardiac anatomy

Vicente Grau – University of Oxford: Quantifying ventricular microstructure: image analysis and computational modelling

## Friday, Nov 7

### 8.30 – 10.00 Session 1: Mechanics and growth modeling

Gernot Plank – Medical University of Graz: High resolution modeling of cardiac electro-mechanics

Martin Genet – ETH Zurich: Growth-induced residual stresses and in vivo-acquired myofiber maps in computational cardiac modeling

Sjur Gjerard – Simula Research Laboratory: A generic right ventricle model for simulating patient-specific pacing procedures from echocardiography data

10.00 – 10.15 Coffee Break

### 10.15 - 12.15 Session 2: Modeling Tools for Electrophysiology

Rolf Krause – Università della Svizzera Italiana: A lightweight approach to parallel adaptive methods in cardiac electrophysiology

Steven Niederer – Kings College London: Modeling ion movement in the heart

Simone Pezzuto – Simula Research Laboratory: Space-discretization error analysis and stabilization schemes for conduction velocity in cardiac electrophysiology

Marie Rognes – Simula Research Laboratory: An adjoint-enabled simulation framework for cardiac electrophysiology



12.30 - 13.30 Lunch

### 13.30 -15.00 Session 3: Geometric and Metamodeling techniques

Pablo Lamata – Kings College London: Diagnostic biomarkers through computational cardiac models

Kristin Tøndel - Simula Research Laboratory: Insight into model mechanisms and more efficient model development and validation by multivariate metamodeling

Krissy McLeod – Simula Research Laboratory: Metamodeling of bi-ventricular structural abnormalities in the ARVC heart

<b>What</b>	
<b>When</b>	Nov 05, 2014 06:00 PM to Nov 07, 2014 03:00 PM
<b>Where</b>	Simula Research Laboratory
<b>Contact Name</b>	Sam Wall
<b>Attendees</b>	Andre Massing Andy Edwards Aslak Tveito August Johansson Axel Loewe Beatriz Trenor Bernardo Lino de Oliveira Bill Louch Edward Vigmond Egil Samset Eleonora Grandi Gabriel Balaban Gernot Plank Glenn Lines Henrik Nicolai Finsberg Javier Saiz Joakim Sundnes Karoline Hørgmo Jæger Karoline Kalleberg Krissy McLeod Marie Rognes Mark Potse Martin Alsnæs Martin Genet Molly Maleckar Nमित Gaur Pablo Lamata Rodrigo Weber dos Santos Rolf Krause Samuel Wall Sergio Alonso Simone Pezzuto Siri Kallhovd Steven Niederer Tom O'Hara Valeriya Naumova Vegard Vinje Vicente Grau Viviane Timmermann
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