



COMPSYSBIO

ADVANCED LECTURE COURSE ON
COMPUTATIONAL SYSTEMS BIOLOGY

Aussois, France
March, 19-25 2017



Monday, March 20th

Stochastic Modeling (chair : O. Gandrillon)

La Parrachée

- 08:20 **Daniel KAHN**
Course opening
- 08:30 **Pieter Rein TEN WOLDE**
Modeling noise in biochemical networks
- 10:00 **Coffee break**
- 10:30 **Ruth BAKER**
Variance reduction approaches to efficient stochastic simulation
- 12:15 **Lunch**
Early afternoon free

Parallel blackboard teaching and hands-on sessions

Le Râteau

- 16:30 **Eugenio CINQUEMANI**
Modeling of stochastic gene expression

L'Echelle

- 16:30 **Hidde DE JONG**
Dynamic models integrating metabolism and gene expression

La Norma

- 16:30 **Frank BRUGGEMAN**
Bacterial fitness maximization and phenotypic diversification strategies

- 19 :00 **Dinner**

Selected short talks (chair: J. Stelling)

La Parrachée

- 20:30 **Daan DE GROOT**
Why maximal metabolic flux requires minimal metabolic complexity
- 20:50 **Emilie ALLART**
Elementary modes refine abstract interpretation of reaction networks with partial kinetic information

Poster session 1

- 21:15-22:00 **Even number** poster presenters

Tuesday, March 21st

Network model inference (chair: J. Banga)

La Parrachée

- 08:30 **Ann BAPTIE**
Model inference and uncertainty in systems biology
- 10:00 **Coffee break**
- 10:30 **Jörg STELLING**
Identification of dynamic cellular network models under uncertainty
- 12:15 **Lunch**
Early afternoon free

Parallel blackboard teaching and hands-on sessions

Le Râteau

- 16:30 **Eugenio CINQUEMANI**
Modeling of stochastic gene expression

L'Echelle

- 16:30 **Hidde DE JONG**
Dynamic models integrating metabolism and gene expression

La Norma

- 16:30 **Frank BRUGGEMAN**
Bacterial fitness maximization and phenotypic diversification strategies

19 :00 **Dinner**

Selected short talks (chair: A. Babtie)

La Parrachée

- 20:30 **Hervé TURLIER**
Modeling of the early mammalian embryo morphogenesis
- 20:50 **Stefan BAUER**
Scalable Inference in Dynamic Systems

Poster session 2

21:15-22:00 **Odd number** poster presenters

Wednesday, March 22nd

Control Theory in Systems Biology (chair: A. Walczak)

La Parrachée

08:30 **Mustafa KHAMMASH**
On the dynamic benefits of intracellular randomness

10:00 Coffee break

Evolutionary systems (chair: A. Walczak)

La Parrachée

10:30 **Isabel GORDO**
Following evolution of commensal bacteria in real time

12:15 Lunch
Early afternoon free

Parallel blackboard teaching and hands-on sessions

Le Râteau

16:30 **Markus KRANTZ**
Scalable mechanistic modelling of cellular signal transduction

L'Echelle

16:30 **Gregory BATT**
Basics in modeling and model calibration: the toggle switch example

La Norma

16:30 **Claudine CHAUIYA**
Qualitative dynamical modelling of (multi-) cellular networks

19 :00 Dinner

Outlook Keynote (chair: D. Kahn)

La Parrachée

20:30 **Douglas KELL**
The cellular uptake of pharmaceutical drugs is mediated by proteinaceous transporters and is thus a problem not of biophysics but of systems biology

Poster session 3

21:30-22:30 Poster gathering

Thursday, March 23rd

Control Theory in Systems Biology (chair: M. Khammash)

La Parrachée

08:30 **Julio BANGA**
Optimal control in systems and synthetic biology

10:00 Coffee break

Evolutionary systems (chair: M. Khammash)

La Parrachée

10:30 **Aleksandra WALCZAK**
Diversity of immune systems

12:15 Lunch
Early afternoon free

Parallel blackboard teaching and hands-on sessions

Le Râteau

16:30 **Markus KRANTZ**
Scalable mechanistic modelling of cellular signal transduction

L'Echelle

16:30 **Gregory BATT**
Basics in modeling and model calibration: the toggle switch example

La Norma

16:30 **Claudine CHAOUIYA**
Qualitative dynamical modelling of (multi-) cellular networks

19 :00 Dinner

Selected short talks (chair: G. Batt)

La Parrachée

20:30 **Dirk BENZINGER**
Tuning multi-gene expression and cell-to-cell variability by dynamic transcription factor control

20:50 **Kirsten JENKINS**
A comparison of directly versus consecutively coupled positive feedback loops and their effect upon the cell cycle checkpoints

21:10 **Magali RICHARD**
Assigning function to natural allelic variation via dynamic modeling of a gene

21:30 **Carlos TOSCANO-OCHOA**
Single-cell analysis of gene expression dynamics in Escherichia coli upon entry into stationary phase

Friday, March 24th

Dynamical systems (chair: H. de Jong)
La Parrachée

- 08:30 **Geneviève DUPONT**
Switches, oscillations and waves in cell biology: a modeling-based approach
- 10:00 Coffee break
- 10:30 **David RAND**
Cell signaling: stochastic dynamics, information and decision-making
- 12:15 Lunch
Early afternoon free

Parallel blackboard teaching and hands-on sessions

Le Râteau

- 16:00 **Claudine CHAUIYA**
Qualitative dynamical modelling of (multi-) cellular networks

L'Echelle

- 16:00 **Gregory BATT**
Basics in modeling and model calibration: the toggle switch example

Closing session (chair: D. Kahn)
La Parrachée

- 17:00 **Hana EL-SAMAD**
Anticipators and Procrastinators, Synthetic Biology and Big Data
- 18:30 Course closure
- 19:30 Gala Course Dinner
- 21:00 Closing course party