

International Centre for Scientific Culture “E. Majorana”

School of Mathematics “G. Stampacchia”

**“OPTIMIZATION, MACHINE LEARNING AND
BIOINFORMATICS”**

PROGRAM OF LECTURES

Thursday September 9, S. ROCCO ROOM
Machine Learning, Optimization and Other Methods

9.30 – 9.45 Welcome

Chair: Elia Biganzoli

9.45–10.45 **Salvatore Gaglio**

Hybrid and Meta-Level Computational Architectures for Intelligent Systems

10.45–11.15 Coffee Break

11.15–12.30 **Roberto Tagliaferri**

Clustering, Visualization and Feature Selection in Genomic Data

12.30–14.30 Lunch

Chair: Roberto Tagliaferri

14.30–15.30 **Elia Biganzoli**

Biostatistical Methods for Bioinformatics

15.30–16.30 **Alfredo Ferro**

Exact and Inexact Subgraph Matching in Large Databases of Graphs

16.30–17.00 Coffee Break

17.00–17.10 **Carlo Morabito** (in honor of Maria Marinaro)

Maria Marinaro: How I Remember Her

17.10–17.20 **Sportelli Tecla Rossana** (in honor of Vito Di Gesù)

A Memory of Vito in Erice

17.20–18.10 **Giosué Lo Bosco**

Machine Learning Methods for Nucleosome Positioning

19.00–21.30 Dinner

Friday September 10, S. ROCCO ROOM
Chemoinformatics

Chair: Panos Pardalos

9.00–11.00 **Pierre Baldi**

Introduction to Chemoinformatics and Drug Discovery

11.00–11.30 Coffee Break

11.30–12.30 **Irene Kouskoumvekaki**

Virtual Screening Methods in Drug Discovery

12.30–14.30 Lunch

Chair: Burkhard Rost

14.30–15.30 **Pierre Baldi**

Compressing and Searching Data: from Molecules to Genomes

15.30–16.30 **Irene Kouskoumvekaki**

Systems Chemical Biology

16.30–16.50 Coffee Break

16.50–17.50 **Panos Pardalos**

Global Optimization in Biomedicine

17.50–18.50 **Carlo Vercellis**

Discrete Support Vector Machines and their Applications in Bioinformatics

19.00–21.30 Dinner

Saturday September 11, S. ROCCO ROOM

Proteomics

Chair: Pierre Baldi

- 9.00–11.00 **Burkhard Rost**
Overview: Evolution Teaches Protein Prediction
- 11.00–11.30 Coffee Break
- 11.30–12.30 **Gianluca Pollastri**
Machine Learning Methods for Protein Structure Prediction
- 12.30–14.30 Lunch

Chair: Gianluca Pollastri

- 14.30–15.30 **Piero Fariselli**
Prediction of Protein Interaction Sites from 3D Structures
- 15.30–16.30 **Panos Pardalos**
Some Recent Developments in Proteomics
- 16.30–16.50 Coffee Break
- 16.50–17.50 **Burkhard Rost**
The International Society for Computational Biology
- 18.00 – 19.00 **Joint Session in San Domenico Room**
Speaker: **Eilon Solan**
Title: *Game Theory: from Nash to Shapley*
- 19.00–21.30 Dinner

Sunday September 12: Daily Trip

Monday September 13, S. ROCCO ROOM

Genomics

Chair: Paolo Frasconi

- 9.00–11.00 **Gunnar Raetsch**
Introduction to Genomics and Predictive Sequence Analysis
- 11.00–11.30 Coffee Break
- 11.30–12.30 **Pierre Baldi**
Mapping Regulatory Networks and Immune Responses on a Genome Wide Scale
- 12.30–14.30 Lunch
- Chair: Gunnar Raetsch*
- 14.30–15.30 **Jean-Philippe Vert**
Segmentation and Classification of Genomic Profiles
- 15.30–16.30 **Gianluca Pollastri**
Functional Genomics: Ab Initio Protein Function Prediction
- 16.30–16.50 Coffee Break
- 16.50–17.50 **Paolo Frasconi**
Introduction to Statistical Relational Learning
- 18.00–19.00 **Joint Session in San Domenico Room**
Speaker: **Aldo Frediani**
Title: *New Perspective on “Variational Analysis and Aerospace Engineering”*
- 19.00–21.30 Dinner

Tuesday September 14, S. ROCCO ROOM

Systems Biology

Chair: *Jean-Philippe Vert*

- 9.00–11.00 **Søren Brunak**
Systems Biology by Data Integration
- 11.00–11.30 Coffee Break
- 11.30–12.30 **Gunnar Raetsch**
Deep Sequencing for Functional Genomics
- 12.30–14.30 Lunch

Chair: *Michal Rozen Zvi*

- 14.30–15.30 **Jean-Philippe Vert**
Reconstruction of Biological Networks
- 15.30–16.30 **Søren Brunak**
Phenotype-Specific Disease Gene Finding
- 16.30–16:50 Coffee Break
- 16.50–17.50 **Søren Brunak**
Mapping Clinical Patient Record Data from the Healthcare Sector onto Systems Biology Frameworks
- 18.00–19.00 **Joint Session in San Domenico Room**
Speaker: **Pierre Baldi**
Title: *Unsupervised Learning, Deep Architectures, and Autoencoders*
- 20.00–23.00 Social Dinner

Wednesday September 15, S. ROCCO ROOM

Systems Biology

Chair: *Paolo Frasconi*

- 9.00–11.00 **Michal Rozen Zvi**
Machine Learning Tools for Delivering Personalized, Omic-Based, Healthcare: HIV as a Case Study
- 11.00–11.30 Coffee Break
- 11.30–12.30 **Jean-Philippe Vert**
Predictive Models in Cancer Informatics
- 12.30–14.30 Lunch

Chair: *Pierre Baldi*

- 14.30–15.30 **Paolo Frasconi**
Applications of Statistical Relational Learning to the Prediction of Protein Beta Partners and Metal Binding Sites
- 15.30–16.00 **Philipp Drewe**
Statistical Tests for Detecting Differential RNA-Transcript Expression from Read Counts
- 16.00–16.30 **Susanne Balzer**
Machine Learning Approaches in Pyrosequencing
- 16.30–16:50 Coffee Break
- 16.50–17.20 **Mario Guarracino**
Mathematical Models of Supervised Learning and their Application to Medical Diagnosis
- 19.00–21.30 Dinner

Thursday September 16: Concluding Remarks and Departures