

MATHEMATICS AND MOLECULAR BIOLOGY VII: MODELING ACROSS THE SCALES — ATOMS TO ORGANISMS

January 5–10, 2002
La Fonda Hotel, Santa Fe, NM

PROGRAM

SATURDAY, JANUARY 5, 2002

- 1:00 pm - 8:00 pm Registration. Mezzanine
- 7:30 pm - 9:30 pm Welcome Reception (Registered Participants Only). La Terraza

SUNDAY, JANUARY 6, 2002

- 7:00 am - 9:00 am Breakfast. La Terraza
- 7:00 am - 5:00 pm Poster Set-up. Ballroom, Mezzanine
- 8:00 am - 8:00 pm Registration. Mezzanine
- 9:30 am - 12:30 pm Mathematics Tutorial. New Mexico Room
Speakers: Dorothy Buck, Sandrine Dudoit
- 10:45 am - 11:15 am Coffee Break. Mezzanine
- 12:30 am - 2:00 pm Lunch (Registered Participants Only). La Terraza
- 2:00 pm - 5:00 pm Biology Tutorial. New Mexico Room
Speaker: Steve Levene
- 3:15 pm - 3:45 pm Coffee Break. Mezzanine
- 6:00 pm - 9:30 pm Conference Dinner (Registered Participants Only). Ballroom
Burroughs Wellcome Lecture: Susan Taylor
- Panel Discussion: *Using your postdoctoral fellowship to launch your career*
Moderator: Tamar Schlick
Panelists: Sandrine Dudoit, Nancy Kopell, Steve Levene

MONDAY, JANUARY 7, 2002

- 7:00 am - 8:15 am Women in Science Breakfast (Registered Participants Only).
La Terraza
- 7:00 am - 8:30 am Breakfast (Registered Participants Only).
Santa Fe and New Mexico Rooms
- 6:30 am - 4:00 pm Registration. Mezzanine

- 8:30 am - 12:25 pm **Session I: *Modeling Molecules***. Ballroom
Chair: Mark Gerstein Co-chair: Michael Levitt
- 8:30 am - 9:20 am Michael Levitt: Protein folding: *A paradigm for computational solutions to biological problems*
- 9:20 am - 10:10 am Mark Gerstein: *Computational proteomics*
- 10:10 am - 10:45 am Coffee Break. Mezzanine
- 10:45 am - 11:35 am Seth Darst: *Structural studies of prokaryotic transcription*
- 11:35 am - 12:25 pm Tamar Schlick: *Polymerase beta opening motion explored by dynamic simulations*
- 12:30 pm - 2:00 pm Working Lunch — Roundtable Discussion of Career Issues (Registered Participants Only). Santa Fe and New Mexico Rooms
- 2:00 pm - 5:55 pm **Session II: *Modeling Organisms***. Ballroom
Chair: David Mumford Co-chair: De Witt Sumners
- 2:00 pm - 2:50 pm Bonnie Berger: *Mathematical Challenges in Protein Motif Recognition and Discovery*
- 2:50 pm - 3:40 pm Nancy Kopell: *Rhythms in the nervous system: themes and variations*
- 3:40 pm - 4:15 pm Coffee Break. Mezzanine
- 4:15 pm - 5:05 pm Simon Levin: *The evolution of robustness*
- 5:05 pm - 5:55 pm David Mumford: *The Brain as a computer: a flawed metaphor*
Dinner on your own.
- 7:30 pm - 9:30 pm Poster Session I. Ballroom, Mezzanine. Cash Bar.

TUESDAY, JANUARY 8, 2002

- 7:00 am - 8:30 am Breakfast (Registered Participants Only). Santa Fe and New Mexico Rooms
- 7:30 am - 4:00 pm Registration. Mezzanine
- 8:30 am - 12:25 pm **Session III: *Bioinformatics***. Ballroom
Chair: Wing Wong
Co-chair: Mike Waterman
- 8:30 am - 9:20 am Terry Gaasterland: *Evaluating metabolic pathways through gene expression data*
- 9:20 am - 10:10 am Chip Lawrence: *Computational Identification and Characterization of Regulatory Modules*

- 10:10 am - 10:45 am Coffee Break. Mezzanine
- 10:45 am - 11:35 am David Siegmund: *Statistical analysis of pairwise local sequence alignments*
- 11:35 am - 12:25 pm Gene Meyers: *On the computer-assisted forensics of mass disasters*
- 12:30 pm - 2:00 pm Lunch (Registered Participants Only). Santa Fe and New Mexico Rooms
- Free afternoon*
- Dinner on your own*
- 7:30 pm - 9:30 pm Poster Session II. Ballroom, Mezzanine. Cash Bar.

WEDNESDAY, JANUARY 9, 2002

- 7:00 am - 8:30 am Breakfast (Registered Participants Only). Santa Fe and New Mexico Rooms
- 7:30 am - 4:00 pm Registration. Mezzanine
- 8:30 am - 12:25 pm **Session IV: *Single Molecules***. Ballroom
Chair: Julio Fernandez
Co-chair: Carlos Bustamante
- 8:30 am - 9:20 am Julio Fernandez: *Single molecule studies of the mechanical stability of proteins*
- 9:20 am - 10:10 am Klaus Schulten: *Modeling the mechanical functions of proteins and DNA*
- 10:10 am - 10:45 am Coffee Break. Mezzanine
- 10:45 am - 11:35 am Steven Smith: *Reversible and irreversible unfolding of single RNA molecules by force*
- 11:35 am - 12:25 pm Sunney Xie: *Single-molecule enzymatic and conformational dynamics*
- 12:30 pm - 1:30 pm Lunch (Registered Participants Only). Santa Fe and New Mexico Rooms
- 1:40 pm - 2:10 pm Report on Monday's Working Lunch. Ballroom
- 2:10 pm - 6:05 pm **Session V: *Cellular Gene Expression***. Ballroom
Chair: Roland Stoughton Co-chair: Terry Speed
- 2:10 pm - 3:00 pm Uri Alon: *Design principles of protein networks*

- 3:00 pm - 3:50 pm Roland Stoughton: *Framework for microarray analysis methods development*
- 3:50 pm - 4:20 pm Coffee Break. Mezzanine
- 4:20 pm - 5:10 pm Wynn Walker: *DNA hybridization modeling and its application to the design of microarrays*
- 5:10 pm - 6:00 pm Wing Wong: *Some recent progress in microarray analysis: examples and lessons*
- 7:00 pm - 9:30 pm Reception (Registered Participants Only). Gerald Peters Gallery, 1011 Paseo De Peralta
- Trainee Workshop. Gerald Peters Gallery
Jonathan Alger: *Collaborating with industry: making contacts and protecting your interests*

THURSDAY, JANUARY 10, 2002

- 7:00 am - 8:30 am Breakfast (Registered Participants Only). Santa Fe and New Mexico Rooms
- 7:30 am - 11:00 am Registration (Mezzanine)
- 8:30 am - 12:25 pm **Session VI: Mesoscale Modeling.** Ballroom
Chair: David Swigon
Co-chair: Wilma Olson
- 8:30 am - 9:10 am Muhammad Zaman: *The entropic benefit of a cross-link in protein association*
- 9:10 am - 9:50 am Christopher Patil: *Genomic analysis of the unfolded protein response: prediction and discovery of novel regulatory motifs*
- 9:50 am - 10:20 am Coffee Break. Mezzanine
- 10:20 am - 11:00 am David Swigon: *Micromechanics of DNA looping*
- 11:00 am - 11:40 am Andrew Ewald: *The molecular control of cell movements in the early vertebrate embryo*
- 11:40 am - 12:20 pm Jody White: *Spontaneous calcium release in ventricular myocytes: mechanisms and implications*
- 12:30 pm - 2:00 pm Lunch (Registered Participants Only). Santa Fe and New Mexico Rooms
- 12:30 pm - 3:00 pm Poster Takedown. Ballroom, Mezzanine