

**Batsheva de Rothschild Seminar on Soft Matter
and Biophysics
Ben-Gurion University and Hod Hamidbar Hotel
The Dead Sea, 10-14 February, 2013**

DAY 0 – Saturday Feb. 9

~16:30 Transportation of foreign participants from the airport to Beer-Sheva.

~20:00 Dinner of foreign participants with the BGU organizing committee.

DAY 1 – Sun Feb. 10

Ben-Gurion University of The Negev, Ilse Katz Institute (IKI) building 51, Auditorium 015

09:30 – 10:30 Arrival, registration, coffee and refreshments.

DAY 1 morning: Biophysics of cells and tissues

Chair: Yigal Meir

| | |
|---------------|--|
| 10:30 – 11:00 | <u>Greetings:</u> BGU President – Prof. Rivka Carmi Dean of Engineering – Prof. Joseph Kost On behalf of IKI Director – Prof. Guy Makov Organizers – A. Bernheim, R. Granek, O. Krichevsky, Y. Tsori |
| 11:00 – 11:30 | Jean-Francois Joanny <i>Growth and instabilities of tissues</i> |
| 11:30 – 12:00 | Jean-Marc di Meglio <i>Mechanics of undulatory locomotion</i> |
| 12:00 – 12:30 | Samuel Safran <i>Non linear and dynamic effects in cellular mechanics</i> |

12:30 – 14:00 LUNCH BREAK

DAY 1 Afternoon: Biophysics of cells, tissues and model cellular systems**Chair: Levi Gheber**

| | |
|---------------|--|
| 14:00 – 14:30 | Francoise Brochard-Wyart <i>Collective migration of cells: role of substrate rigidity</i> |
| 14:30 – 15:00 | Kinneret Keren <i>Self-organization in actin-based motility</i> |
| 15:00 – 15:30 | Francois Amblard <i>E-cadherin mechanosensitivity, dynamic stability of epithelia, and the nucleation of instabilities</i> |
| Coffee break | |
| 16:00 – 16:30 | Jacques Prost <i>Active soft matter and Cell mechanics</i> |
| 16:30 – 17:00 | Ludwik Leibler <i>Vitrimers, a new class of organic materials</i> |

17:10 Buses to "HOD HAMIDBAR Hotel", Ein-Bokek, Dead Sea

19:00 Dinner

DAY 2 - Mon Feb. 11

07:00 – 09:00 Breakfast

DAY 2 Morning: Materials and Bio-materials

Chair: Amir Goldbourn

| | |
|---------------|--|
| 09:00 – 09:30 | Roy Bar-Ziv <i>Synthetic cellular functions on a biochip: Gene expression and protein assembly</i> |
| 09:30 – 10:00 | Uri Raviv <i>Dynamic self-assembly of biomolecular structures</i> |
| 10:00 – 10:30 | Roy Beck- Barkai <i>Order and disorder in biological self-assembled structures</i> |
| Coffee break | |
| 11:00 – 11:30 | Ashod Aradian <i>Towards self-assembled metamaterials</i> |
| 11:30 – 12:00 | Francois Tournilhac <i>Supramolecularchemistry for processes and materials</i> |
| 12:00 – 12:30 | Oleg Krichevsky <i>DNA as exemplary polymer</i> |

12:30 – 14:00 LUNCH BREAK

DAY 2 Afternoon: Biophysics of bio-molecules: RNA, DNA, proteins**Chair: Leah Gheber**

| | |
|---------------|--|
| 14:00 – 14:30 | Henri Orland <i>Folding RNA with pseudoknots</i> |
| 14:30 – 15:00 | William Gelbart <i>RNA, capsid protein, and viral assembly</i> |
| 15:00 – 15:30 | Matthias Rief <i>Conformational dynamics of single protein molecules under load</i> |
| Coffee break | |
| 16:00 – 16:30 | Jörg Langowski <i>Chromatin dynamics - live cells, single molecules and computer simulations</i> |
| 16:30 – 17:00 | Richard Lavery <i>Unlocking DNA recognition with molecular simulations</i> |
| 17:00 – 17:30 | Yariv Kafri <i>Classes of fast and specific search mechanisms for proteins on DNA</i> |
| 17:30 – 19:00 | Poster session & Informal discussions (Coffee bar open) |

19:00 Dinner

| | |
|---------------|--|
| 20:30 – 21:30 | AFTER DINNER DISCUSSION PANEL (drinks & snacks) Chair: Granek. Participants: Auvray, Bensimon, Gelbart, Krichevsky, Langowski, Lavery, Orland, Rabin, Rief, Schmidt. <i>Biological polymers: Did polymer physics help in understanding their biological function?</i> |
|---------------|--|

DAY 3 - Tue Feb. 12

| | |
|---------------|--|
| 07:00 – 09:00 | Breakfast |
| 09:00 – 12:00 | Social activity: <ul style="list-style-type: none"> a) A guided tour to Massada b) Visit to the SPA. c) Self-guided dry/wet walk in the Bokek stream. |
| 12:30 – 14:00 | LUNCH BREAK (for those staying at the hotel) |

DAY 3 Afternoon: Biophysics of Active and Passive Bio-Soft Matter

Chair: Itzhak Fishov

| | |
|---------------|---|
| 14:00 – 14:30 | Avinoam Ben-Shaul <i>Entropy, Energy, and Bending of DNA in Viral Capsids</i> |
| 14:30 – 15:00 | Erwin Frey <i>Physical Principles of Cell Polarity</i> |
| 15:00 – 15:30 | Christoph Schmidt <i>Carbon nanotubes as mechanical stealth probes in model systems and cells</i> |
| Coffee break | |
| 16:00 – 16:30 | David Bensimon <i>Do bacteria play tit-for-tat? Dynamics of a public good in bacterial micro-colony</i> |
| 16:30 – 17:00 | Didier Chatenay <i>Plasmid copy number variability in response to antibiotics stress</i> |
| 17:00-17:30 | Giovanni Cappello <i>Mechanical Stress and Tumor Growth</i> |
| 17:30 – 19:00 | Poster session & Informal discussions (Coffee bar open) |

19:00 Dinner

| | |
|---------------|---|
| 20:30 – 21:30 | AFTER DINNER DISCUSSION PANEL (drinks & snacks) Chair: Bernheim. Participants: Elbaum, Frey, Garini, Joanny, Safran, Schmidt. <i>Intra-cellular dynamics as active soft matter: What do we miss?</i> |
|---------------|---|

DAY 4 - Wed Feb. 13

07:00 – 09:00 Breakfast

DAY 4 Morning: Interfaces – Statics and Dynamics

Chair: Hanna Rapaport

| | |
|---------------|---|
| 09:00 – 09:30 | Jacob Klein <i>Origin of the long-ranged attraction between hydrophobized surfaces: Symmetry-breaking of Coulomb interactions</i> |
| 09:30 – 10:00 | Moshe Gottlieb <i>Dynamics of amphiphilic block copolymers at the water/oil interface</i> |
| 10:00 – 10:30 | Elie Raphael <i>Moving at the air-water interface</i> |
| Coffee break | |
| 11:00 – 11:30 | David Andelman <i>Domains, phase transitions and "rafts" in membranes</i> |
| 11:30 – 12:00 | Carlos Marques <i>Lipid bilayers under mechanical and chemical stress: polymer pressure and oxidation</i> |
| 12:00 – 12:30 | Michael Urbakh <i>Modeling friction: from nano- to macro-scales</i> |
| 12:30 – 14:00 | LUNCH BREAK |

DAY 4 Afternoon: Biophysics of Nano-pores and Biomolecules

Chair: Pascal Hersen

| | |
|---------------|---|
| 14:00 – 14:30 | Michael Elbaum <i>Thermodynamics and the nuclear pore</i> |
| 14:30 – 15:00 | Loic Auvray <i>The transport of proteins through nanopores</i> |
| 15:00 – 15:30 | Yitzhak Rabin <i>Effect of charge, hydrophobicity and amino-acid sequence on the organization of unfolded domains of nucleoporins in the nuclear pore complex</i> |
| Coffee break | |
| 16:00 – 16:30 | Yuval Garini <i>Genome organization in the nucleus studied by diffusion characterization</i> |
| 16:30 – 17:00 | Daniel Harries <i>Impact of confinement on the order and disorder of a viral minichromosome</i> |
| 17:00 – 19:00 | Poster session & Informal discussions (Coffee bar open) |
| 19:00 | Dinner |
| 20:30 – 24:00 | SOCIAL EVENT |

DAY 5 – Thursday, Feb. 14

07:00 – 09:00 Breakfast

| DAY 5 Morning: Materials, Biomaterials & Processes | |
|---|--|
| Chair: TBA | |
| 09:00 – 09:30 | Oren Regev <i>Nanotube-based composites: Tougher and lighter</i> |
| 09:30 – 10:00 | Yael Roichman <i>Enhanced diffusion in quasi 2d colloidal suspension</i> |
| 10:00 – 10:30 | Mario Feingold <i>Optical Tweezers assisted imaging of the Z-ring in E. coli: measuring its radial width</i> |
| Coffee break | |
| 11:00-11:30 | David Lukatsky <i>Design principles for non-consensus protein-DNA binding in eukaryotic genomes</i> |
| 11:30 – 11:50 | CONCLUDING COMMENTS AND DISCUSSION |

12:00 Bus to the airport (direct)

12:30 Bus to Beer-Sheva & Tel-Aviv