

TAU – ESPCI Summer school

September 8-12, 2019, Tel Aviv, Israel

Workshop Program- Dach Hall

| Hours | Sunday 8/9/2019 | Monday 9/9/2019 | Tuesday 10/9/2019 | Wednesday 11/9/2019 | Thursday 12/9/2019 |
|-------------|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------|
| 9.00-10.00 | A broad physics based perspective on self assembly Michael Brenner (Harvard) | Self-assembly and curvature in membrane systems Gerard Wong (UCLA) | Controlling disorder to tune light-matter interaction Remi Carminati (ESPCI) | Applications of Self Assembled Structures Lihi Adler-Abramovich (TAU) | Yitzhak Rabin Roey Amir Roy Beck |
| 10.00-11.00 | A broad physics based perspective on self assembly Michael Brenner (Harvard) | Introduction to membrane remodeling in biology Gerard Wong (UCLA) | Controlling disorder to tune light-matter interaction Remi Carminati (ESPCI) | What can nonequilibrium do for you? Gili Bisker (TAU) | Jose Bico |
| 11:00-11:30 | Coffee Break | Coffee Break | Coffee Break | Coffee Break | Coffee Break |
| 11:30-12:30 | How to make it? Synthesis of amphiphilic building blocks and polymers Roey Amir (TAU) | Autocatalytic Sets Philippe Nghe (ESPCI) | Self-assembly of actin networks in cells Olivia du Roure (ESPCI) | Applications of Self Assembled Structures Lihi Adler-Abramovich (TAU) | Gerard Wong Philippe Nghe Lihi Adler-Abramovich |
| 12:30-14:15 | Lunch | Lunch | Free Time | Lunch | Lunch |
| 14:15-14:45 | Celine Valery Cyrille Jeancolas Jordan Hervy | Juliane Klamser Prabhu Prasad Swain Gonçalo Paulo | | Pratik Mullick Agnese Curatolo Morgan Hesser | Teresa Lopez-Leon Elie Raphael |
| 14:45-15:45 | How to make it? Synthesis of amphiphilic building blocks and polymers Roey Amir (TAU) | The error thresholds Philippe Nghe (ESPCI) | | Elasto capillarity: when surface tension deforms solids Jose Bico (ESPCI) | Zorana Zeravcic |
| 15:45-16:00 | Coffee Break | Coffee Break | | Coffee Break | Coffee Break |
| 16:00-17:00 | Nanosopic structural characterisation techniques Roy Beck (TAU) | Nanosopic structural characterisation techniques Roy Beck (TAU) | | Capillary origam Jose Bico (ESPCI) | Olivia du Roure Remi Carminati |
| 17:00-18:30 | Dinner + Poster Session | | | | |



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Oral presentations by Students

1. Celine Valery (RMIT University), *Native and biomimetic peptide hormone self-assembly: biological relevance and biomedical applications*
2. Cyrille Jeancolas (ESPCI), *RNA diversification and the emergence of Darwinian evolution*
3. Jordan Hervy (Institut Jacques Monod), *Dynamic instability of microtubules with memory effect*
4. Juliane Klamsr (ESPCI), *Thermodynamic phases in two-dimensional active matter*
5. Prabhu Prasad Swain (University of Mumbai), *Using Super-Resolution Radial Fluctuations (SRRF) to study nuclear dynamics*
6. Gonçalo Paulo (University of Lisbon), *Synchronization on Binary Mixtures of Locally Coupled Brownian and Active Oscillators*
7. Pratik Mullick (University of Calcutta), *Phase transition in a biased reaction-diffusion system*
8. Agnese Curatolo (Harvard University), *Self-assembly of protein-made structures*
9. Morgan Hesser (Drexel University), *Histidine as a pH Switch for the Fibrilization and Gelation of Short Peptides in Water*



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Symposium Schedule

12 September 2019 / Tel Aviv University

- 08:30 –09:00 Gathering +Coffee
- 09:00–09:30 Yitzhak Rabin (BIU), *Dynamics of Chemically Active Droplets*
- 09:30–10:00 Roey Amir (TAU), *Designing polymeric amphiphiles with high molecular precision*
- 10:00–10:30 Roy Beck (TAU), *On Physics, Biology and Multiple Sclerosis*
- 10:30–11:00 Jose Bico (ESPCI), *Making shapes*
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- 11:00-11:30 Coffee
- 11:30–12:00 Gerard Wong (UCLA), *Self-assembly in innate immunity and autoimmunity*
- 12:00-12:30 Philippe Nghe (ESPCI), *From growth to natural selection in compartmentalized autocatalytic reactions*
- 12:30–13:00 Lihi Adler-Abramovich (TAU), *Harnessing Nature to Create New Organic Materials for Tissue Regeneration*
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- 13:00-14:00 Lunch
- 14:00–14:30 Teresa Lopez-Leon (ESPCI), *Passive and active nematics: Order emerging from confinement*
- 14:30–15:00 Elie Raphael (ESPCI), *Rearrangement of 2D aggregates of droplets under compression*
- 15:00–15:30 Zorana Zeravcic (ESPCI), *Memories in a jar*
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- 15:30-16:00 Coffee
- 16:00–16:30 Olivia du Roure (ESPCI), *Mechanics and assembly of Actin cytoskeleton networks*
- 16:30–17:00 Remi Carminati (ESPCI), *Transparency of cornea-like fibrillar structures*
- 17:00 Closing remarks



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Poster session – Shenkar Physics (Lobby)

8 September 2019

| Poster no. | Presenter | Poster title |
|-------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Priscila Cardoso | Ultrashort self-assembling peptides as antimicrobial agents: Structure-function relationship and biomedical applications |
| 2 | Aleksandr Kazakov | 3D Self-Consistent Field method for simulating polyelectrolyte hydrogel |
| 3 | Varvara Prokacheva | The analytical theory of hydrophobic weak polyelectrolyte gel |
| 4 | Martina Clairand | Exploring the coupling between active and passive nematics |
| 5 | Mengshi Wei | Collective behavior of active colloidal gels |
| 6 | Jyoti Prasad Banerjee | Chemical kinetics of a model self-replicating assembly |
| 7 | suryabrahmam buti | Effect of short chain alcohols on bending rigidity of lipid bilayer |
| 8 | Shreyas Wagle | Synthesis and Characterization of Polymeric Micelles as Nanocarriers for Bio-Orthogonal Catalysts |
| 9 | Dana Cohen Gerassi | Structural Characterization of Self-Assembled Supramolecular Hydrogel |
| 10 | Lialy Khadeja | Development of Smart Nonwoven Fabric using Bio-inspired and Biocompatible Self-Assembled Nanostructures |
| 11 | Lion Morgenstein | |
| 12 | Shahar Tevet | Synthesis and Characterization of Polymeric Micelles as Nanocarriers for Bio-Orthogonal Catalysts |
| 13 | Ofir Tal Friedman | Driving by Self-organization of macroscopic rod shaped active particles |
| 14 | Daniel Zaretsky | controlled breaking of detailed balance |
| 15 | Anton Livshits | Polarity modulations and actin re-organization in <i>Hydra</i> regeneration |
| 16 | David Azulay | Aggregation mechanism of TasA aggregation in acidic conditions |
| 17 | Lital Shani-Zerbib | The Relation between Body Axis Polarity and Mechanical Processes in Morphogenesis during Hydra Regeneration |
| 18 | Malak Abu-Hussien | An aggregative peptide derived from gamma D crystallin as a model for its amyloidogenic aggregation in cataract and its inhibition |
| 19 | Maya Molco | Fibers as Microreactors for the Growth of HKUST-1 and ZIF-8 Metal Organic Frameworks (MOFs) towards Fabrication of Active Performance Textiles |



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| Poster no. | Presenter | Poster title |
|------------|------------------------|----------------------------------------------------------------------------------------------------------------|
| 20 | Nicole Edelstein-Pardo | Spontaneous Fracturing and Self-Healing in Electrospun Microfibers of Block Copolymers |
| 21 | Roie Cohen | |
| 22 | Shiran Ziv Sharabani | Thermally Induced Shape-shifting of Micrometer Scale Polymeric Fibers and Meshes |
| 23 | Itzhak Grinberg | A Method of Protecting Enzymes From Oxygen Damage by Hydrogel Systems |
| 24 | Aman Deep | Experiemental Realization of Restart Process |
| 25 | Ashim Paul | Novel small molecules for inhibiting nano-assemblies of Alpha-Synuclein amyloids in Parkinson's disease |
| 26 | Moumita Ghosh | Injectable Alginate-Peptide Composite Hydrogel as a Scaffold for Bone Tissue Regeneration |
| 27 | Pandeewar Makam | |
| 28 | Rakesh Chatterjee | Motion of Active Tracer in 2D Lattice with Cross-shaped Particles |
| 29 | Somrita Ray | |
| 30 | Yu Chen | High-efficiency fluorescence through bioinspired supramolecular self-assembly |
| 31 | Francesca Netti | Effect of PEGylation on Fmoc-FF Hydrogels Self-Assembly |
| 32 | Noa Burshtein | Microparticles distribution in inertio-elastic vortex flow |
| 33 | Shang Zhang | Correlated rigidity percolation and colloidal gels |
| 34 | Alexander Blokhuis | Chemical evolution: Beyond the single pot |
| 35 | Cyrille Jeancolas | RNA diversification and the emergence of Darwinian evolution |
| 36 | Lucas Prevost | Dynamics of shape transition: from 2D ribbons to 3D chiral structures |
| 37 | Juliane Klamsner | Two-dimensional melting in active matter |
| 38 | Matan Yah Ben Zion | Light-Driven Fuel-Free Thermo-Capillary Micro-Swimmers |
| 39 | Maxime Ardré | Cellulose and colonisation of the air-liquid interface by pseudomonas fluorescens: hydrodynamical consequences |
| 40 | Prabhu Prasad Swain | Using Super-Resolution Radial Fluctuations (SRRF) microscopy to study nuclear dynamics |
| 41 | Ashwini Krishna | Single File Dynamics of Active Brownian Particles |
| 42 | Daniel Khaykelson | Quantifying the Hysteresis of Hepatitis B Virus-Like Particles Disassembly using Small Angle X-ray Scattering |
| 43 | Deborah Schwarcz | The Effect of Disordered Substrate on self-assembly and Crystallization in 2D |



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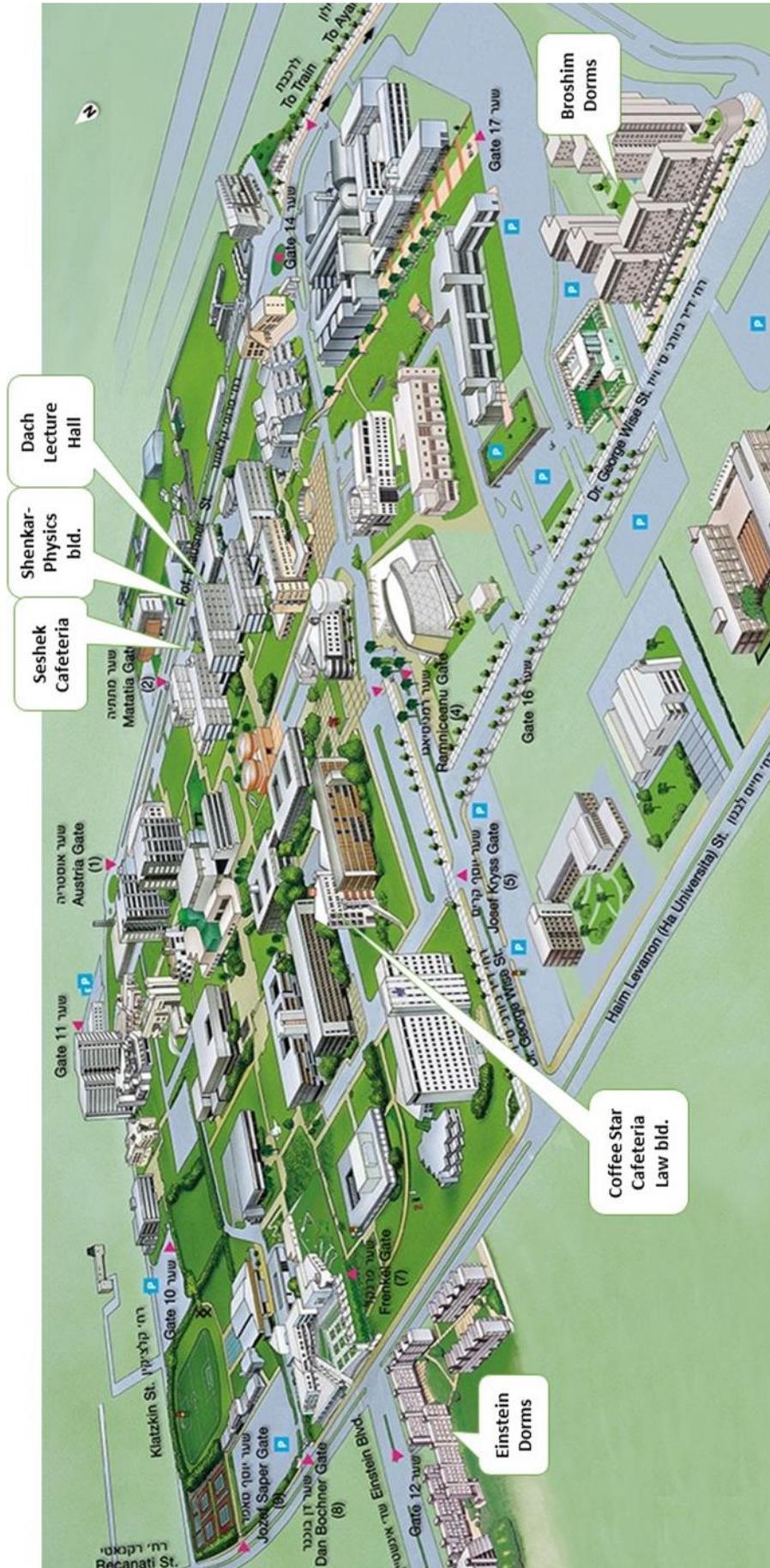
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| Poster no. | Presenter | Poster title |
|------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 44 | Michael Chasnitsky | Brownian ratchet approach explains particle engulfment and displacement at sub-critical ice front velocities |
| 45 | Niv Ierushalmi | Centering and symmetry breaking in confined contracting actomyosin networks |
| 46 | Orlando Marin | Colloidal icosahedra and other polyhedra: from synthesis to cross-sectional electron microscopy imaging |
| 47 | Oshrat Shtangel | Quantifying the Effects of Membrane Lipids on Water Proton Relaxation |
| 48 | Yonit Maroudas- Sacks | Actin organization as an active nematic and its role in morphogenesis in Hydra regeneration |
| 49 | Zohar Arnon | Structural Manipulation of Self-Assembled Supramolecular Polymers |
| 50 | Chen Bar-Haim | Surface response of a semi-infinite polymer network |
| 51 | Ankit Agrawal | Is the packing of cells important for tissue morphogenesis? |
| 52 | Sarah Kostinski | A microbial growth law from simple kinetics of ribosome self-replication |
| 53 | Naomi Oppenheimer | Hurricane dynamics in a membrane |
| 54 | Gonçalo Paulo | Synchronization on Binary Mixtures of Locally Coupled Brownian and Active Oscillators |
| 55 | Morgan Hesser | Histidine as a pH Switch for the Fibrilization and Gelation of Short Peptides in Water |
| 56 | Kai Tao | Rigid Tryptophan-Containing Aromatic Dipeptide Assemblies for Power Harvesting |
| 57 | Oindrila Halder | Spin Active Luminous Excitonic States in Ultrathin Doped Nanosheets |
| 58 | Elad Arad | Revisiting Thioflavin T (ThT) Fluorescence as a Marker of Protein Fibrillation – a Prominent and Overlooked Role of Electrostatic Interactions |
| 59 | Gal Yosefi | Macroscopic sacs and membranes of hierarchically assembled bio-polymers and peptides |



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