Physics of Life 2025

Wednesday 26 March

8:30 AM - 9:00 AM	Studio One	**Arrival Tea/Coffee and Pastries**
9:00 AM - 9:45 AM	Auditorium	**Keynote Speaker: Satyajit Mayor:** The membrane of a living cell: an ATP fuelled fabric
9:45 AM - 10:15 AM	Studio One	**Morning Break**
10:15 AM - 12:15 PM	Auditorium	**Cell Architecture and Forces** **10:15 AM - 10:45 AM Gijsje Koenderink:** A deep dive into the material world of the human body **10:45 AM - 11:00 AM Alexander Mietke:** Mechanics of asymmetric cell division **11:00 AM - 11:15 AM Margarita Staykova:** Interstitial hydrodynamic instabilities sculpt cell adhesion contacts **11:15 AM - 11:30 AM Francois Nedelec:** Refined collision statistics support a force-based model of cortical microtubule organisation **11:30 AM - 11:45 AM Lazar Novakovic:** Punching holes and pulling threads: Cell Wall, the most complex tapestry of nature **11:45 AM - 12:15 PM Matthieu Piel:** Water movements in and out of the cell nucleus
	Queen A Queen's Suite	**Emerging Areas in the Physics of Life** (Session sponsored by the British Biophysical Society) **10:15 AM - 10:45 AM Hannah Smithson:** The physics of small-scale eye movements **10:45 AM - 11:00 AM Abimbola Feyisara Adedeji-Olulana:** Alternative mode of cell division in MRSA **11:00 AM - 11:15 AM Victor Velasco Berrelleza:** TORCphysics: A physical model of supercoiling mediated regulation in synthetic gene circuits **11:15 AM - 11:30 AM Steven Quinn:** Golden signals: transforming blood-based biomarker detection with next-generation photonic biosensors **11:30 AM - 11:45 AM Mitra Rezaei:** General molecular communication model in multi-layered spherical channels **11:45 AM - 12:15 PM Aakash Basu:** Deciphering the mechanical code of DNA and its impact on DNA:protein interactions

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	Queen B Queen's Suite	**Microbes Across Length Scales** **10:15 AM - 10:45 AM Rosalind Allen:** Modelling bacterial colonisation of a urinary catheter: different factors control long-term versus short-term clinical outcomes **10:45 AM - 11:00 AM Ayantika Saha:** Phase transition induced wrinkling in Bacillus Subtilis biofilm: The role of γ-PGA and EPS **11:00 AM - 11:15 AM Klaudia Staśkiewicz:** Substrate geometry affects population dynamics in a bacterial biofilm **11:15 AM - 11:30 AM Leonardo Mancini:** Lung-like spatial limits and mechanical forces enable C. albicans survival in a pathogenic polymicrobial community **11:30 AM - 11:45 AM Hannah Ochner:** Correlated cryo-EM and cryo-FIB-SIMS enables spatial and chemical imaging of biological specimens **11:45 AM - 12:15 PM Achillefs Kapanidis:** Organising bacterial transcription via liquid-liquid phase separation of transcription factors
12:15 PM - 1:30 PM	Studio One	**Lunch**
	Auditorium	**Lunchtime Talk: Henry Royce Institute** (12:45 PM - 1:05 PM)
	Queen A Queen's Suite	**Lunchtime Talk: EPSRC** (12:30 PM - 1:10 PM)
	Queen B Queen's Suite	**Lunchtime Talk: Medical Physics and Biophysics at IOP Publishing** (12:45 PM - 1:05 PM) **Sara Bebbington** Physical Biology Publisher, Carol Clark Physics in Medicine and Biology Publisher, IOP Publishing
1:30 PM - 3:00 PM	Auditorium	**Physics of Life Roadmap Session** **1:30 PM - 2:15 PM Community Session: Guided by Alice Pyne and Raveen Tank** **2:15 PM - 3:00 PM Roadmap Discussion: Guided by Mark Leake and Jamie Hobbs**
3:00 PM - 3:30 PM	Studio One	**Afternoon Break**

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3:30 PM - 5:30 PM	Auditorium	**Tissue Growth, Mechanics and Mechanosensing** **3:30 PM - 4:00 PM Naomi Nakayama:** Predicting future biological forms through mechano-eco-evo-devo **4:00 PM - 4:15 PM Melissa Tomkins:** Rethinking stomatal mechanics: Insights from a new model of onion stomata **4:15 PM - 4:30 PM Carina Dunlop:** Active control of focal adhesions and contractility in cells and tissues: understanding the role of mechanical coupling **4:30 PM - 4:45 PM Sangwoo Kim:** A nuclear jamming transition in embryonic tissues **4:45 PM - 5:00 PM Rastko Sknepnek:** Cell-level modelling of active forces in early-stage development **5:00 PM - 5:30 PM Sonia Contera:** Nanoscale viscoelasticity of living tissues with AFM: physics of biological growth and shape across temporal and spatial scales
	Queen A Queen's Suite	**Bioelectricity Across Scales** **3:30 PM - 4:00 PM Jenny Zhang:** Photosynthesis on an electrode **4:00 PM - 4:15 PM Elisa Nerli:** Fast electrical signals trigger proliferation underlying organ regeneration **4:15 PM - 4:30PM TBC** **4:30 PM - 4:45 PM Edoardo Cianflone:** Phototaming of bacterial bioelectricity **4:45 PM - 5:00 PM TBC** **5:00 PM - 5:30 PM Ashley Nord:** Probing spatiotemportal electrochemical dynamics on single bacterial cells
	Queen B Queen's Suite	**Immunity, Resistance and Host/Pathogen Dynamics** **3:30 PM - 4:00 PM Somenath Bakshi:** Time-resolved measurement of phage infection cycles in individual cells **4:00 PM - 4:15 PM Aaron Smith:** An agent-based model of the bacteriophage lytic cycle to understand the evolutionary impact of stochasticity in life history parameters **4:15 PM - 4:30 PM Cameron Boggon:** Single-cell bacterial patterning to dissect interspecies interactions in a minimal nose microbiome that inhibits Staphylococcus aureus **4:30 PM - 4:45 PM Yael Lebel:** A simple four archetype model of infection space **4:45 PM - 5:00 PM Amy Briffa:** Engineering gene regulatory networks to design disease resistant crops **5:00 PM - 5:30 PM Jennifer Rohn:** Bladder battleground: probing host/pathogen interactions in advanced human cell-based urothelial microtissue models

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5:45 PM - 6:30 PM	Auditorium	**Keynote Speaker Otger Campàs:** Sculpting life through rigidity transitions
6:30 PM - 7:15 PM	Harrogate Convention Centre	**Coaches Depart for the Conference Dinner**
7:15 PM - 11:00 PM	Pavilions Of Harrogate,	**Drinks Reception and Conference Dinner** Pavilions Of Harrogate, Great Yorkshire Showground, Harrogate, North Yorkshire, HG2 8QZ