Physics of Life 2025

Monday 24 March

8:30 AM - 9:00 AM	Mezzanine area outside Auditorium (Level 5)	**Early Career Satellite Event (ECSE) Registration and Refreshments**
9:00 AM - 9:15 AM	Auditorium	**Welcome (ECSE)**
9:15 AM - 10:15 AM	Auditorium	**Session 1 Full Oral Talks (ECSE)** **9:15 AM - 9:35 AM Gabriel Abrahams:** Quantum spin resonance in engineered magneto-sensitive fluorescent proteins enables multi-modal sensing in living cells **9:35 AM - 9:55 AM Richard Henshaw:** How small is too small: a spatio-temporal spectroscopic quantification of single-cell exchange between marine microbes **9:55 AM - 10:15 AM Rosa Catania:** Optimising hybrid vesicles for membrane protein reconstitution: applications and insights
10:15 AM - 10:35 AM	Auditorium	**Session 2 Flash Talks (ECSE)** **10:15AM – 10:18AM Catherine Fan:** Protein capture using synthetic co-transcriptionally folded RNA condensates in mammalian cells **10:18AM – 10:21AM Luca Sesta:** Detecting epistasis from SARS-CoV-2 genomic data **10:21AM – 10:24AM Sarah Graham:** Exploring the frameshifting element in SARS-CoV-2 using smFRET **10:24AM – 10:27AM Alice Attenborough:** Using whispering gallery modes to monitor single-enzyme turnover events of NanoLuc **10:27AM – 10:30AM Zachary Sun:** Feedback between F-actin organization and active stress govern criticality and energy localization in the cell cytoskeleton
10:35 AM - 11:15 AM	Mezzanine area outside Auditorium (Level 5)	**Morning Break (ECSE)**

Physics of Life 2025

11:15 AM - 12:15 PM	Auditorium	**Session 3 Full Oral Talks (ECSE)** **11:15 AM - 11:35 AM Maria Zacharopoulou:** Designing modular DNA-protein nanostructures against hard-to-treat cancer targets **11:35 AM - 11:55 AM Lee-Ya Chu:** Microtubule tip-generated forces drive bipolar spindle organization and chromosome segregation **11:55 AM - 12:15 PM Shunsuke Ichii:** Enhanced enzyme diffusion as Maxwell's Demon: Selective increase of exothermal reaction
12:15 PM - 12:35 PM	Auditorium	**Session 4 Flash Talks (ECSE)** **12:15PM – 12:18PM Douglas Brown:** Friction controls spatial patterning in active fluids **12:18PM – 12:21PM Avishuman Ray:** Mechanics of force sensing in Piezo ion channels **12:21PM – 12:24PM Ryota Orii:** Structural response of microtubule and actin cytoskeletons to direct intracellular loads **12:24PM – 12:27PM Qi Zhou:** Transport dynamics of red blood cells in the microcirculation **12:27PM – 12:30PM Jan Kocka:** Topological states in out-of-equilibrium allosteric molecular assemblies
12:35 PM - 1:10 PM	Mezzanine area outside Auditorium (Level 5)	**Lunch (ECSE)**
1:05 PM - 2:00 PM	Mezzanine area outside Auditorium (Level 5)	**Conference Registration and Arrival Tea/Coffee and Cake**
1:30 PM - 2:00 PM	Queen B Queen's Suite	**Lunchtime Talk: From Great Science to Great Business** **Neville Young,** Director of Enterprise and Innovation, Health Innovation Yorkshire and Humber
2:10 PM - 2:15 PM	Auditorium	**Welcome**
2:15 PM - 3:00 PM	Auditorium	**Keynote Speaker Lorna Dougan:** Hierarchical biomechanics: understanding and exploiting the physics of protein networks
3:00 PM - 3:30 PM	Mezzanine area outside Auditorium (Level 5)	**Afternoon Break 1**

Physics of Life 2025

3:30 PM - 5:30 PM	Auditorium	**Protein Structure, Dynamics and Interactions** **3:30 PM - 4:00 PM Laura Itzhaki:** Engineering the folding and function of tandem-repeat proteins: Teaching old proteins new tricks **4:00 PM - 4:15 PM Matteo Degiacomi:** Learning (from) protein dynamics **4:15 PM - 4:30 PM Charlotte Dodson:** Direct experimental measurement of conformational interconversion in protein kinases and its modification by phosphorylation and ligand binding **4:30 PM - 4:45 PM Charley Schaefer:** Self-assembly of topological networks of intrinsically disordered proteins **4:45 PM - 5:00 PM James Garnett:** Legionella regulation of biofilm growth through a unique protein conformational switching mechanism **5:00 PM – 5:30PM Ehmke Pohl:** Structural biology of the Virosphere
	Queen A Queen's Suite	**Differentiation and Development** **3:30 PM - 4:00 PM Takashi Hiiragi:** Optimality for developmental robustness **4:00 PM - 4:15 PM Olivier Witteveen:** Optimising information transmission in the canonical Wnt pathway **4:15 PM - 4:30 PM Tom Hiscock:** How does a finger get its knuckles? Reaction diffusion models in the tetrapod limb and beyond **4:30 PM - 4:45 PM Joel Hochstetter:** Stem cell density regulation in mouse skin homeostasis **4:45 PM - 5:00 PM Blanca Pijuan-Sala:** Visualizing chromatin accessibility spatially during early stages of embryogenesis **5:00 PM - 5:30 PM Ewa Paluch:** Cross-talk between cell mechanics, cell shape and cell state

	Queen B Queen's Suite	**Evolution, Ecology and Epidemiology** **3:30 PM - 4:00 PM Zena Hadjivasiliou:** Chance and constraints in the evolution of GRN-driven developmental patterning **4:00 PM - 4:15 PM Paula García-Galindo:** RNA plasticity emerges as an evolutionary response to fluctuating environments **4:15 PM - 4:30 PM Réka Borbély:** Evolutionary optimization of gene regulation **4:30 PM - 4:45 PM Hassan Alam:** A general framework for designing evolutionary experiments to select specific phage phenotypes using neural networks, statistical simulations, and symbolic regression **4:45 PM - 5:00 PM Mike Evans:** Modelling evolution of risk-aversion and extreme altruism **5:00 PM - 5:30 PM Richard Neher:** Mutation, purifying selection, and adaptive evolution of SARS-CoV-2
5:30 PM - 7:30 PM	Studio One	**Poster Session 1, Drinks Reception and Exhibition Commences**
7:30 PM - 10:00 PM	Cold Bath Brew Co.	**Early Career Drinks Reception (ECSE)** This session is oversubscribed. To accommodate everyone who has registered, there will be two sittings: 7:30 pm to 9:00 pm and 9:00 pm to 11:00 pm. Places will be allocated on a first-come, first-served basis upon arrival. Cold Bath Brewing Co. 44-46 King's Road, Harrogate, HG1 5JW