# Cambridge Mathematics Placements Presentation Day

**Thursday 15th August 2019**  
Centre for Mathematical Sciences, University of Cambridge

<table>
<thead>
<tr>
<th>From 10:30 am</th>
<th>Tea and coffee (Central Core)</th>
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<tbody>
<tr>
<td>11:00 am</td>
<td>Meeting Room 4</td>
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</table>
| **Optimisation approaches to be used with simulation of bioprocess chromatography**  
*Raafay Younus, GSK* | **Machine Learning for Security Technologies**  
*Maisie Muir, Iconal Technology* |
| 11:20 am | **Lessons from Failure: Overcoming the Survivorship Bias**  
*Quinten Tupker, GSK* | **Microswimmers in an obstacle lattice**  
*Rosie Cates, Cavendish Laboratory* |
| 11:40 am | **Likelihood-free inference for stochastic models of bacterial infection dynamics**  
*Callum McLean, Dept. of Veterinary Medicine* | **Bacteria, Scattering and Machine Learning**  
*Zechen Zhang, Cavendish Laboratory* |
| 12:00 pm | **Data Release Automation**  
*Roan Talbut, Health Data Insight* | **Quantum Computing for Chemistry on Noisy Devices**  
*Shirui Lu, Riverlane* |
| **12:30 pm** | Lunch (Central Core) |
| 2:00 pm | **Implantation of dopants in Silicon Carbide**  
*Georgios Aliatimis, Silvaco Europe, UK* | **Mathematical Finance in the Energy Sector**  
*Alex Partridge, Centrica* |
| 2:20 pm | **Ambient Oxidation of Semiconductor Devices**  
*Jimmy Liu, Silvaco Europe, UK* | **Predicting the Lifetime of Flowers**  
*Nathoël Da Costa, M&M Flowers* |
| 2:40 pm | **Exploring Lossless Compression Using Normalising Flow**  
*Yu Pan, Cavendish Laboratory* | **Hedging Wind Power Production using Forecast Data**  
*Suraj Shah, BP* |
| 3:00 pm | **Lightning Location**  
*Jamie Meacham, The Met Office* | **Crowded Trades**  
*Oscar Donlan, Oxford Asset Management* |
| **3:30 pm** | Tea and coffee (Central Core) |
| 4:00 pm | **Characterisation of beating heart cell oscillations**  
*Bill Xuan, GSK* | **Measuring the impact of prior distributions on pharmacological model parameters**  
*Qing Chang, GSK* |
| 4:20 pm | **Tracking the beat in heart cell videos**  
*James Bayliss, GSK* | **Effects of Sampling Bias on Continuous Phylogeography**  
*Antanas Kalkauskas, EMBL-EBI* |
| 4:40 pm | **Cell tracking with light sheet fluorescence microscopy**  
*Tim Graute, Cambridge Advanced Imaging Centre* | **Investigation into the performance of fragment selection strategies for DNA sequencing**  
*Charlotte Manser, EMBL-EBI* |
| 5:00 pm | **Causal Inference Methods for Gene Regulatory Networks**  
*Ben Norman, GSK* | **Optimisation on Matrix Manifolds**  
*Graham Van Goffrier, Dept. of Engineering* |
| **5:30 pm** | CMP programme review and feedback seminar (Meeting Room 4) |
| **7:00 pm** | CMP Presentation Day Dinner (Downing College)  
*Drinks from 7:00 pm for dinner at 7:30 pm* |
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Organisations with projects presented today

BP
We are a global energy business with wide reach across the world’s energy system. We have operations in Europe, North and South America, Australasia, Asia and Africa. We find and produce oil and gas on land and offshore. We move energy around the globe. We manufacture and market fuels and raw materials used in thousands of everyday products, from mobile phones to food packaging.

Cavendish Laboratory
The Cavendish Laboratory is the Department of Physics at the University of Cambridge. Two CMP students are undertaking projects in the Croze Group, which investigates the biophysics of microorganisms, specialising in the experimental and theoretical study of swimming microbes and microbial symbiosis. Austen Lamacraft is supervising a third CMP project in the Theory of Condensed Matter group.

Centrica
Centrica is a leading international energy services and solutions provider focused on satisfying the changing needs of our customers and enabling the transition to a lower carbon future. We supply energy and services to over 26 million customer accounts mainly in the UK, Ireland and North America through strong brands such as British Gas, supported by around 13,000 engineers and technicians.

Department of Engineering
The Department of Engineering is the largest department in the University of Cambridge. The research portfolio develops pinnacles of world-class excellence, which adapt and combine to address a vast array of engineering challenges. Across research, teaching and graduate study, the Department of Engineering offers all its staff, students and industry partners a highly networked community for sharing and developing engineering knowledge.

Cambridge Advanced Imaging Centre (CAIC)
Many powerful modern imaging techniques have recently been developed, yet their exploitation in biology and biomedical research has largely been prevented by the high cost of their translation into widely available instruments and the specialist skills required for their use. Instruments developed in laboratories within specific Cambridge research programmes are often not available to the University’s wider biomedical research community. The Cambridge Advanced Imaging Centre aims to overcome this barrier by forming a network that draws together imaging activity across the whole University to serve the biomedical community.

Department of Veterinary Medicine
The Department of Veterinary Medicine at Cambridge is at the forefront of veterinary science and education and is a centre of excellence for teaching and research. Our mission is to improve the prevention and treatment of diseases of animals by defining and applying best clinical practice, by understanding and developing the science underpinning best practice, and by embedding an education programme in the veterinary sciences that delivers the best veterinary practitioners, academics and research scientists.

European Molecular Biology Laboratory - European Bioinformatics Institute (EMBL-EBI)
At EMBL-EBI, we make the world’s public biological data freely available to the scientific community via a range of services and tools, perform basic research and provide professional training in bioinformatics. We are part of the European Molecular Biology Laboratory (EMBL), an international, innovative and interdisciplinary research organisation funded by 26 member states and two associate member states.

GlaxoSmithKline (GSK)
We have three global businesses that research, develop and manufacture innovative pharmaceutical medicines, vaccines and consumer healthcare products. Our goal is to be one of the world’s most innovative, best performing and trusted healthcare companies.

Health Data Insight
Health Data Insight is a social enterprise overseen by the Office of the Regulator of Community Interest Companies, which ensures we meet our social purpose and that the value we create is protected and used for social good.
Our aim is to:
- create value for public sector organisations by finding new knowledge from both existing and new sources of information
- provide a data management and linkage service that allows partners to access information in safe-havens that guarantee the privacy of each individual patient.
- create visual, internet-based information services and applications that can be easily accessed, used and understood
- supply organisations with information and services that they can use to understand and help improve their services
- deliver information to patients in accessible ways to help them improve the ways they choose, access and use services and understand their clinical condition and care.

Our strategic objectives are aligned to NHS and wider government policy to improve transparency and access to data, encourage self-management, enable choice and foster the use of social enterprises to deliver public services.

Iconal Technology
Iconal Technology is an independent contract research and consultancy company, not affiliated with any product manufacturer or systems vendor. Iconal carries out research and consultancy exclusively for government departments and agencies involved in homeland security and defence, and offers impartial, independent, science-based advice.

The Met Office
The Met Office is the UK’s National Meteorological Service. We operate 24/7 and employ more than 1,700 at 60 locations throughout the world. We are recognised as one of the world’s most accurate forecasters, using more than 10 million weather observations a day, an advanced atmospheric model and a high-performance supercomputer to create 3,000 tailored forecasts and briefings a day. These are delivered to a huge range of customers from the Government, to businesses, the general public, armed forces, and other organisations.

MM Flowers Ltd
MM Flowers, established 11 years ago, is the UK’s leading, integrated cut flower supplier, with a unique ownership model and innovative practices. We supply leading supermarkets with a range of cut flower products into both retail stores and online platforms. In addition, our R and D activity is at the cutting edge of scientific and varietal developments, which facilitates strategic relationships with our supply base. MM Flowers is owned by the Munoz Group, a leading breeder, grower and distributor of citrus and grapes; Vegpro, East Africa’s largest flower and vegetable producer; and Elite, the leading flower grower and breeder in South America.

Oxford Asset Management
Oxford Asset Management is an investment manager based in Oxford, UK. We launched in 2004, and are a committed team who focus on exceptional research and technological implementation. We apply computational models to financial markets, analysing a range of data and information, and exploiting relationships among financial instruments such as stocks, futures, and currencies. Most of the fund’s trading is managed automatically by our proprietary algorithms and software. Our team works with the latest technologies to develop these algorithms and tools to navigate a wide range of markets.

Riverlane
Our Mission is to transform the discovery of new materials and drugs using our world-leading quantum simulation engine. We are building a simulation engine for microscopic systems, one that accurately accounts for quantum effects. We will bring the discovery of materials and drugs into a new computational era, one where the physical laboratory is used only sparingly to validate results, fundamentally accelerating the pace of discovery.

Silvaco Europe, UK
Silvaco, Inc. is a leading EDA provider of software tools used for process and device development and for analog/mixed-signal, power IC and memory design. The portfolio also includes tools for power integrity sign off, reduction of extracted netlist, variation analysis and also production-proven intellectual property (IP) cores. The company is headquartered in Santa Clara, California, and has a global presence with offices located in North America, Europe, Japan and Asia. For over 30 years, Silvaco has enabled its customers to bring superior products to market in the shortest time with reduced cost. Semiconductor fabs and design houses from around the globe have relied on Silvaco’s expertise to help develop the “technology behind the chip”. Silvaco’s mission is to help our customers accelerate the pace of technological innovation and their time to market while reducing their costs in developing the next-generation chips.

All of the information on this sheet has been drawn directly from organisational websites.