

FACULTY NEWS BULLETIN

17 March 2021

ANNOUNCEMENTS



The Faculty would like to welcome Amy Dolben, who joins us as a Project Manager and Administrator, and Navneet Gidda, who will join us as a Communications Manager, both in the Cambridge Centre for AI in Medicine (CCAIME). A belated welcome also to Ciara Dangerfield who has joined DAMTP as a Senior Scientific Programme Manager with the JUNIPER consortium.

PhD Approvals

Many congratulations to the following students who have recently completed their PhD's:

Nils Prigge	DPMMS	On tautological classes of fibre bundles and self-embedding calculus
Elliot Lynch	DAMTP	On the Dynamics of Noncircular Accretion Discs

John Polkinghorne 1930-2021

John Polkinghorne, who held the Chair of Mathematical Physics in DAMTP from 1968 until 1979, has died.

John made significant contributions to several areas of elementary particle theory, including the analytic structure of the S-matrix in quantum field theory, the covariant parton model and proton scattering at high momentum transfer. His work on the first topic provided the theoretical foundations of the bootstrap approach to the strong interactions. This seeks to constrain the scattering matrix of elementary particles by directly imposing properties such as unitarity, causality and crossing symmetry which in turn follow from the basic principles of quantum mechanics and relativity. Importantly, it does not rely on a specific dynamical model but rather seeks a unique or minimal solution of these consistency conditions. With Richard Eden, Peter Landshoff and David Olive he authored "The Analytic S-matrix" (1966), which remains a crucial text on this approach and has enjoyed very many citations in recent times. Although the bootstrap fell out of favour in phenomenological particle physics with the advent of the Standard Model, it has remained highly influential in mathematical physics where similar ideas were applied with great success to integrable field theories in two dimensions. The S-matrix bootstrap was instrumental to the development of string theory and, in recent years, has also been revived in the development of new methods for calculating QCD scattering amplitudes and exploring the space of possible S-Matrices in two and higher dimensions.

John was a founding member and head of the DAMTP High Energy Physics group. During his time in the department he supervised many outstanding PhD students who, along with many other members of the DAMTP group at that time, went on to make significant contributions to particle physics. His PhD students include several DAMTP faculty (emeritus): Ian Drummond, Peter Goddard and Peter Landshoff, as well as James Stirling (Durham, Cavendish, Imperial).

John had a friendly and outgoing personality, and offered encouragement to all the PhD students in the group, not just those working in his own research areas. He also initiated the practice of group members meeting each day for coffee at 11 am in the HEP common room on the first floor of the old DAMTP building in Silver Street. This evolved into the current successful morning coffee gatherings of the HEP and GR groups in the Potter Room at CMS (sadly interrupted by the Covid lockdowns).

John was elected as a Fellow of the Royal Society in 1974. He chose to resign from his professorship in 1979 to train for ordination and became an Anglican priest in 1982. After serving as a parish priest, he became Dean of Trinity Hall in 1986 and then President of Queens' College in 1986 until 1996. He was knighted in 1997 although the title Sir was not used as he was a priest. He wrote many books on science and theology and was awarded the Templeton prize in 2002. He remained active in retirement and continued to be an influential thinker on the relationship between science and religion.

The Emmy Noether Society

Last week to celebrate International Women's Day, the ENS Committee shared biographies of female mathematicians. To see the biographies in full, please see the [ENS Facebook page](#).



DEMON Network

Data science and AI for dementia

Deep Dementia Phenotyping (DEMON) Network, is a global network for the application of data science and AI to dementia research. It connects academics, clinicians and industry partners. Their vision is to revolutionise dementia research and healthcare by bringing innovators together and harnessing the power of data science and AI. For more information about the network, please see [here](#).

Benefits of joining the Network are:

- Opportunity to join 8 Working Groups for collaborative research papers and funding applications
- Access to a Clinical Advisory Panel of experienced clinicians offering clinical input to research
- Access to a Patient Public Involvement Group offering lay input to research
- Supportive framework with opportunities for members at all career stages
- Members-only Slack Channels for discussion, networking and collaboration
- Early Career Development support with two dedicated ECR Leads
- Research initiatives including training, networking, seminars and workshops
- Monthly email bulletin with relevant news, events and opportunities
- Monthly lecture series on topics of interest chosen by Network members

Smith-Knight and Rayleigh-Knight Prizes 2020

The adjudicators consider that the following essays submitted for the Smith-Knight and Rayleigh-Knight Prizes for 2020 are of distinction, and have classed them in groups of equal merit.

Group 1

- * Guillem Garcia i Tarrach of Wolfson College, ' p -Arithmetic Homology of Some Locally Analytic Representations, Eigenvarieties and Galois Representations'
- * Campbell McLaughlan of Pembroke College, 'Quantum Computing with Majorana Fermions'

Group 2

- * Hannah Banks of Newnham College, 'Charting the Fifth Force Landscape'
- * Sam Bradford of Churchill College, 'Analytic solution for aerodynamic noise generated by a cylinder with an azimuthally-varying serrated edge'
- * Vojtech Dvorak of Trinity College, 'Graph Theory: Extremal Problems and Games'
- * Callum Fairburn of Christ's College, 'Nonlinear dynamics of hydrodynamic tori as a model of waves and oscillations in astrophysical discs'
- * Sam Lewin of Downing College, 'Turbulent mixing in linearly stratified shear layers'
- * Ismael Sierra del Río of Trinity College, ' E_2 -cells, spin mapping class groups and quadratic symplectic groups'
- * Andreas Stavrou of Churchill College, 'A non-symplectic representation from configuration spaces of surfaces'
- * Fan Ye of Churchill College, 'Invariants of Balanced Sutured Manifolds and $(1, 1)$ Knots via Floer Theory'

Group 3

- * Edward Beaty of Trinity College, 'Drop Coalescence with Van Der Waals Attraction'
- * Georgia Ioannou of St Edmund's College, 'Investigation of impact cratering transient dynamics with materials that mimic planetary impact processes'
- * Harvey Klyne of Emmanuel College, 'Average Derivatives as Generalised Linear Coefficients with Plug-in Machine Learning Estimation'
- * Anton Rask Lundborg of Hughes Hall, 'Conditional Independence Testing in Hilbert Spaces with Applications to Functional Data Analysis'
- * Laurence Mayther of St John's College, 'Obstructions to the Long-Time Convergence of the Laplacian (Co) Flow and New Invariants of Holonomy G_2 Metrics'
- * Andjela Sarkovic of Trinity College, 'Cutoff for random walk on two communities random graph'
- * Sophie Tobin of Jesus College, 'Routing of Water Beneath the Greenland Ice Sheet Following Supraglacial Lake Drainage'

Group 4

- * David Baker of Trinity Hall, 'Transient effects in Dark Matter N-Body simulations'
- * Jason Joykutty of Gonville & Caius College, 'Existence of Zero-damped Modes for Nearly Extremal Horizons'
- * Yijie Li of Gonville & Caius College, 'Optimisation of scalar mixing via boundary manipulations in three-dimensional Poiseuille flow'
- * Mohammed Rifath Khan Shafi of Wolfson College, 'Holographic Wheeler-DeWitt Quantum Gravity'
- * Jan Stanczuk of Clare College, 'Trying to make sense of Wasserstein GANs'

EVENTS

Pandemic - a year on!

Friday 19 March, 2pm

The School of the Physical Sciences invite all **staff** to a Zoom event, Pandemic - a year on!, on Friday 19 March at 2pm. Please join for an opportunity to reflect on some of the difficulties staff have been experiencing, as well as the support available, potential concerns about returning to the workplace and to consider what a return to the workplace might look like. The School would also like to capture some of the positive aspects of working from home, for example in relation to new and more flexible ways of working.

The session will be introduced by Professor Nigel Peake and the following guests have been invited to speak:

Dr Martin Vinnell - "It's ok to not be ok"

Dr James Keeler/Professor Bhaskar Vira - From a Department perspective

Dr Miriam Lynn - Support for Wellbeing

Mr James Hope / Dr Sohini Kar Narayan - Wellbeing Advocates

Professor Val Gibson - University Gender Equality Champion - Career Support

There will also be an opportunity for questions and discussion.

In addition to this session, an email address will be set up via which staff can provide feedback, comments and suggestions. The resources available are also being updated on the School's webpages and details of both of these will be launched shortly.

To join, please register [here](#). The session will also be recorded for those unable to join due to other commitments.

Cambridge Festival 2021

26 March – 4 April

The new, interdisciplinary Cambridge Festival (replacing the Cambridge Science Festival and the Cambridge Festival of Ideas) will take place from 26 March to 4 April 2021. The festival will primarily be digital in 2021, to enable wide-reaching engagement during the COVID-19 pandemic.

There will still be strong and distinct platforms for the Sciences and the Arts, Humanities and Social Sciences. And the new Festival will include a uniquely Cambridge eclectic mixture of over 350 events and activities: from panel discussions, film premieres, and self-guided walking tours, to 'try this at home' activities for the whole family. Topics cover the breadth of Cambridge research and will be presented across the Festival's four themes: Society, Health, Environment and Explore!

View the programme [here](#).

Know Moore About: Sharing your Research Online

Tuesday 23 March, 1pm-2pm

Completing your research project is no longer the final step in the research lifecycle. It's important to ensure that those both within and outside academia see your work and this means thinking strategically about how you promote both yourself and your work online. This session will look at how you can build a promotional strategy tailored to your work, things to think about when building your online presence and how to maximise and measure your impact. Book a place [here](#).
