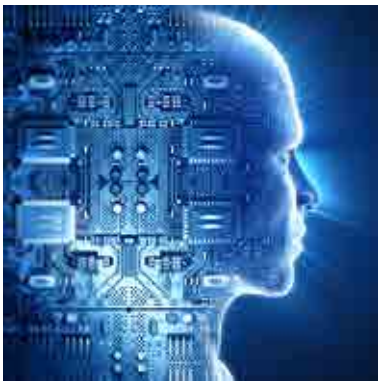
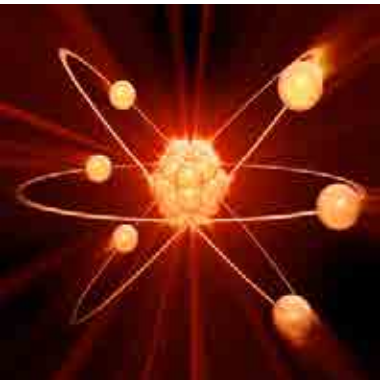
Keynote Forum
August 23, 2018

Physics 2018





3rd International Conference on

Applied Physics

August 23-24, 2018 | London, UK

Louis Lyons

Oxford University, UK

What is Probability? Bayes and frequentist approaches

Probability is a concept widely used in conversation. We look at various ideas of what probability is, and in particular the Bayesian and Frequentist approaches. Most of the examples used are from everyday life. We also consider how these ideas affect statistical techniques used in analyzing data. This lecture should be accessible to people with little or no experience of statistical analysis.

Speaker Biography

Louis Lyons is an experimental particle physicist working on the CMS experiment at CERN's Large Hadron Collider. His specialty is the use of advanced statistical techniques for analyzing data. He has written two books on this subject, and has numerous published papers. He initiated the PHYSTAT series of workshops on statistical techniques for particle physics, and has lectured at many international Laboratories and Universities around the world.

e: l.lyons@physics.ox.ac.uk

Notes:

Koen Bertels

Delft University of Technology, The Netherlands

A full stack implementation of a superconducting qubit processor

In this presentation, we will describe the work we currently do in QuTech in collaboration with Intel. We are working on the full stack implementation of the system design of a superconducting quantum processor. This processor will be used as an accelerator connected to a classical computer. We also use this design to steer the semiconducting quantum processor. In addition, we investigate the long term and scalable challenges that we need to solve to make any kind of quantum co-processor.

Speaker Biography

Koen Bertels is professor and head of the newly created Quantum and Computer Engineering department in the faculty of Electrical Engineering, Mathematics and Computer Science. His research focuses on hardware/software co-design for heterogeneous multi-core platform and he investigates alternative computing architectures and technologies. Since 4 years, he is heavily focusing on quantum computing. In that sense, he started a new section called Quantum Computer Architecture Lab and is currently a principal investigator for architectural design in the TUDelft quantum research lab, QuTech.

e: k.l.m.bertels@tudelft.nl

Wolfgang Kautek

University of Vienna, Austria

Femtosecond laser matter interaction in the optical far and near field

High intensity laser pulses can generate high densities of electrons in matter by avalanche processes and by deterministic multiphoton-electron coupling. The dependence of irreversible modification thresholds on the number of pulses, the so-called incubation, could be quantified by a new model combining the spot size and pulse number dependence of ablation thresholds based on optically active high-density defects with a separation below the laser wavelength. This is successfully demonstrated with organic and inorganic materials. Optical lithography resolution is limited by light diffraction. Apertureless scanning near-field optical lithography (NFOL) can overcome this barrier. There, a scanning probe microscope tip brought down to a few nanometres from a substrate is illuminated by a focused femtosecond laser beam. The laser electromagnetic field is strongly enhanced at the tip-substrate gap, producing modifications on the substrate. Thermal contributions are discussed on the basis of heat accumulation. Sub-wavelength structuring at the nanoscale is observed, with lateral resolution of about 10 nm and thus surpassing the light diffraction limit.

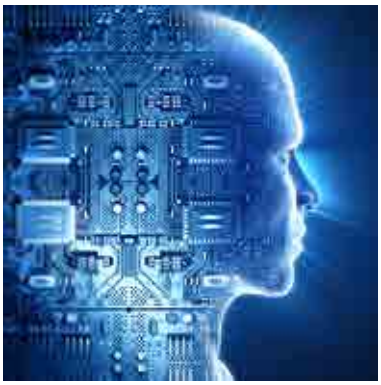
Speaker Biography

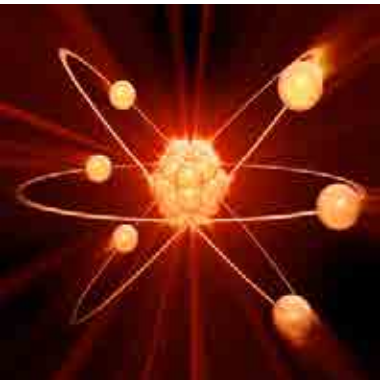
Wolfgang Kautek holds a diploma in chemical engineering from the Vienna University of Technology, Austria, and a doctoral degree from the University of Technology Berlin, Germany. He spent many years, as a research scientist at the University of Kentucky, USA, at the Fritz-Haber-Institute of the Max-Planck-Society, Berlin, at the IBM San Jose Research Laboratory, California, USA, and the Siemens Research Centre, Erlangen, Germany. In 1981, he was awarded the Otto-Hahn-Medal of the Max-Planck-Society. From 1988 until 2004, he was head of the Laboratory for Thin Film Technology of the Federal Institute for Materials Research and Testing, Berlin, Germany. In 2003, Wolfgang Kautek was installed as adjunct professor at the Institute of Chemistry of the Free University Berlin, Germany. In 2004, Wolfgang Kautek followed a call as full-professor for Physical Chemistry at the University of Vienna.

e: wolfgang.kautek@univie.ac.at

Keynote Forum
August 24, 2018

Physics 2018





3rd International Conference on

Applied Physics

August 23-24, 2018 | London, UK

Elemer Elad Rosinger

University of Pretoria, South Africa

What if Quantum theory violates all Mathematics?

It is shown by using a rather elementary argument in Mathematical Logic that if indeed, quantum theory does violate the famous Bell Inequalities, then quantum theory must inevitably also violate all valid mathematical statements, and in particular, such basic algebraic relations like 0=0, 1=1, 2=2, 3=3,... and so on.

An interest in that result is due to the following three alternatives which it imposes upon both Physics and Mathematics:

- Quantum Theory is inconsistent
- Quantum Theory together with Mathematics are inconsistent.
- Mathematics is inconsistent.

In this regard one should recall that, up until now, it is not known whether Mathematics is indeed consistent.

Speaker Biography

Elemer Elad Rosinger obtained his Doctorate of Science in 1972 at the University of Bucharest, Romania. He has over 200 research papers published in mathematics and physics, as well as over a dozen research monographs. During 1983-2002 he was at the University of Pretoria, where after retirement he continues to be Emeritus Professor. Recently, he opened the Gottfried Wilhelm Leibniz Basic Research Institute, GWL-BRI (Public Benefit Organization, PBO), Johannesburg, South Africa

e: eerosinger@hotmail.com

Notes:

Alessandra Toncelli

University of Pisa, Italy

MID and FAR-IR spectroscopy of rare earth ions

The mid-infrared region (MID-IR) is an extremely interesting region to study roto-vibrational transitions of molecules. Possible applications comprise material analysis, quality control, dynamic measurements, environmental and medical monitoring applications, forensic testing, analysis of art objects. Available sources in this region (such as quantum cascade lasers and lead-salt diode lasers) need cryogenic operation and/or suffer from strong limitations as for output peak power, tunability and beam quality. A completely different approach for MID-IR quantum light generation is the use of doped insulating crystals as active media. Transition metals like Cr2+ and Fe+2 have already been used as dopant agents for broadly tunable pulsed emission, but the use of rare earths can widen the emission wavelength regions available and could permit cw emission with excellent beam quality. A key role, in this case is played by the host crystal which must have low phonon energy to prevent non-radiative quenching of the emission at this wavelength. For this reason, new types of host crystals must be investigated and their growth optimized. A brief review of the state of the art and recent developments in this field will be given.

Speaker Biography

Alessandra Toncelli has obtained her PhD in Physics in 1998 at the University of Pisa. Since 2017, she is an associate professor at the Physics Department of Pisa. Her scientific interest was initially aimed to the growth and spectroscopy of crystalline materials for photonic applications in visible and near infrared regions. In particular, she studied and characterized the optical and spectroscopic properties of oxide and fluoride crystals with rare earths for laser applications. She has published more than 160 articles on International journals. She currently holds an h-index of 41 both in Scopus and in ISI web of knowledge.

e: alessandra.toncelli@unipi.it

Notes:

allied academies

3rd International Conference on

Applied Physics

August 23-24, 2018 | London, UK

Constanza Rubio Michavila

Polytechnic University of Valencia, Spain

An open acoustic barrier: Design and characterization

Nowadays, due to the problems that exist in terms of noise pollution and its impact on health, it is common to use acoustic barriers. Traditionally, these barriers consisted of rigid and continuous materials that are interposed between the source and the receiver. However, there are situations in which the characteristics of the problem necessitate the use of new noise shielding systems. The design and characterization of open acoustic barriers is presented in this work. These are tunable acoustic barriers based on periodic arrays of subwavelength slits. The acoustic response of periodically arranged rectangular scatters with a subwavelength separation between them and embedded in air is discuss. The results point out that these systems can be tuned to attenuate specific band noise and can be used instead of classical barriers.

Speaker Biography

Constanza Rubio Michavila was born in Spain. Her research line has been developed in the area of Applied Acoustics. Throughout his research career, she has participated in 14 research projects subsidized in public calls. She has published 30 articles in journals included in the JCR, of which 2 articles are published in Physical Review Letters, 3 Applied Physics Letters, 1 Physical Review B, 2 Physical Review E, 2 Applied Physics Express and 1 Europhysics Letters, among others. All of them located in relevant positions in their category. She is also co-author of 25 papers presented at international congresses, several of which are invited talks. She has been chairman in several international congresses. In the technological field, she is co-author of 3 patents. In addition, in the teaching field is author and teacher of several MOOCs that are on the edX platform. She is also a conventional teacher in undergraduate and master's subjects. She is also the director of 6 final master's thesis projects, some of them international and co-director of several doctoral theses.

e: constanzarubio67@gmail.com

Notes: