Professor Clive Speake PhD CPhys

Professor of Experimental Physics

School of Physics and Astronomy (/schools/physics/index.aspx)

Contact details

Telephone +44 (0) 121 414 4679 (tel:+44 121 414 4679)

Fax +44 (0) 121 414 3772

Email c.c.speake@bham.ac.uk (mailto:c.c.speake@bham.ac.uk)

School of Physics and Astronomy
University of Birmingham
Edgbaston
Birmingham
B15 2TT
UK

About

Clive Speake is Professor of Experimental Physics in the School of Physics and Astronomy.
Clive's main research interests are in experimental tests of gravitation. He has published work on testing the equivalence principle, measurements of Newton's constant of gravity, testing the inverse square law at μm and geophysical scales.

He and his research group has pioneered the use of superconducting suspensions for use as sensors of weak forces and also developed novel interferometers for use in cryogenic torsion balances. This has lead to a patent on the design of an interferometer that is insensitive to mirror tilt-misalignment. These devices are now commercially available.

Qualifications

- BSc University of Birmingham 1979
- PhD University of Cambridge 1983

Biography

Clive started his research career at University of Cambridge when he performed a measurement of Newton's constant of gravitation using a beam balance. After a short spell in industry as an acoustics engineer working in the oil exploration industry in France he was appointed as a research fellow and later a staff member at the International Bureau of Weights and Measures (BIPM) near Paris.

Whilst at BIPM, Clive and Terry Quinn developed a beam balance for mass comparisons of 1 kg mass standards which worked with an unprecedented level of accuracy (a few parts in 1011) and also used the balance to perform a test of the equivalence principle using a range of materials. Clive spent a year at JILA in Boulder USA, where he co-led and completed a test of the inverse square law of gravity on a 320 m weather tower in Erie Colorado.

Returning to Birmingham as a Lecturer in 1989, he worked with George Isaak on Solar and Stellar oscillations. In the meantime the continued collaboration with Terry Quinn at BIPM led to a precision measurement of Newton's constant of gravity in 2001. This work is still continuing.

In 1996, still in Birmingham, he founded the Experimental Gravitational Physics group and has been working on searches for violations of the inverse square law at short ranges and violations of the equivalence principle using room temperature and cryogenic torsion balances.

Teaching

Teaching Programmes

- Photonics Group Study yr 3
- Relativistic astrophysics and black holes yr 3
- Yr 2 tutorials
- Post graduate lectures on Fourier techniques.

Postgraduate supervision

I am supervising one research student at present: Hasnain Panjwani. Starting in Oct 2011 I will be supervising Miranda Bradshaw as a CASE student with Astrium.

Research

RESEARCH THEMES

Tests of the inverse square law of gravity. Measurement of Newton's constant of gravitation, development of superconducting levitation systems for detection of weak forces, development of novel tilt insensitive interferometers for commercial and research applications

Other activities

• Member of the editorial board of Classical and Quantum gravity.
• Development and commercialisation of novel interferometers that are tolerant of mirror misalignment

Publications

Selected:

T.J.Quinn, C.C.Speake, S.J.Richman, R.S.Davis and A.Picard. 'A new determination of G using two methods'. Phys. Rev. Letts. 87, 111101 2001.

G.D.Hammond, C.C.Speake, C.Trenkel and A. Pulido Paton 'New Constraints on short-range forces coupling mass to intrinsic spin'. Physical Review Letters 98, 081101 (2007).

C.C.Speake and C.Trenkel 'Forces between conducting surfaces due variations of surface potential'. Phys. Rev. Letts 16, 160403 2003.