University of Birmingham

Dr Mark Colclough BSc, PhD

Lecturer
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About

Mark Colclough is a lecturer in physics and is the director of laboratory learning and teaching. He is co-author of over 50 research papers in scientific journals, primarily in the field of superconductivity. He specialises in sensitive electrical measurements at cryogenic temperatures and is an author of widely-used software for instrumentation.

Qualifications

- PhD in low temperature physics (Nuclear ordering) University of Birmingham, 1986
- Bsc Hons in Physics, University of Birmingham, 1981

Biography

Mark Colclough obtained his PhD for studies on the nuclear magnetic ordering of the rare earth metals neodymium and praseodymium at very low temperatures, as revealed by specific heat measurements. Since then, his work has focused on superconductivity, both as an academic researcher and in industry. In 1989 he became an early member of a silicon valley startup company which commercialised superconducting devices, in which he managed the SQUID programme. He was awarded an EPSRC Advanced Fellowship in 1994, and joined the permanent staff of the school of Physics and Astronomy in 1999.

Teaching

- Responsible for all teaching laboratories
- Yr 2 Laboratory
- Yr 2 Projects
- Yr 3 C++
- Yr 3 critique

Postgraduate supervision

- Supervision of research PhDs in superconducting quantum devices

Research

RESEARCH THEMES

- Quantum effects in coupled superconducting resonators
- Spin injection into superconductors
- SQUID magnetometers using low and high temperature superconductors
- Novel Josephson junctions

Other activities

- Consultant on SQUID systems and precision instrumentation

Publications

- T. Lindstroem et al., Properties of superconducting planar resonators at millikelvin temperatures, Physical Review B 80, 132501 (2009)
- J. E. Healey et al., Magnetic field tuning of coplanar waveguide resonators Applied Physics Letters 93, 043513 (2008)
- X. Deng et al., Search for spin-polarisation effects in La0.7Mn0.3Ca3O3/YBa2Cu3O7-delta thimn film bilayers, Physical Review B 77, 144528 (2008)

- T. Lindstroem et al., Circuit QED with a flux qubit strongly coupled to a coplanar transmission line resonator, Superconductor science and technology 20, 814 (2007)
- LP Lee et al., Monolithic 77K DC SQUID magnetometer, Applied Physics Letters 59, 3051 (1991)
- K Char et al., Bi-epitaxial grain boundary junctions in Yba2Cu3O7, Applied Physics Letters 59, 733 (1991)
- M.S. Colclough, C.E. Gough et al, Radiofrequency SQUID operation usinga ceramic high temperature superconductor, Nature 328, 47 (1987)
- C.E. Gough, M.S.Colclough, et al; Nature 326, 855 Flux quantization in a high temperature superconductor (1987)

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