



PHYSIKALISCHES KOLLOQUIUM

Referent: **Prof. Dr. Stephen Lee**
University of St. Andrews



Thema: **μ SR Studies of Novel Proximity Effects in Magnetic-Superconducting Thin Films**

Zeit und Ort: Dienstag, 20.06.2017, 16:40 Uhr
Recknagel-Bau, Hörsaal REC/C213, Haeckelstr. 3

Leiter: Prof. Dr. Hans-Henning Klauss

Kurzfassung: It is well known that conventional superconducting (S) and ferromagnetic (F) order are frequently antagonistic due to the pair breaking influence of the ferromagnetic exchange on the superconducting state. When superconducting and magnetic materials are juxtaposed in artificial thin film structures, however, novel effects can arise in the vicinity of the interfaces. The generation of long-range equal-spin triplet correlations within non-collinear ferromagnetic layers is now firmly established both theoretically and experimentally, which in future may find application in superconducting spintronics. Much less is known about the influence of magnetism on the superconducting elements of such devices. We have used the unique low-energy muon spin rotation (LEM) technique to probe the local magnetisation within the superconducting layers of S-F structures, including superconducting spin valves where the degree of magnetic non-collinearity can be carefully controlled. By using LEM to probe the spatial dependence of the local magnetisation, we find some intriguing results, which on the whole cannot yet be readily understood within the quasi-classical Usadel framework frequently used to address these problems. We also find some interesting results on proximitising normal non-magnetic metals, which although known theoretically have not been much explored experimentally in thin film architectures.

Biographie: Stephen Lee has been a Professor at the University of St Andrews since 2001, where he was also Head of Physics 2003-2009. After his BSc he worked for several years in industry and subsequently obtained his PhD in the field of rare earth magnetism, before moving on to work on superconducting materials in Birmingham and Zürich. On receiving a 5-year EPSRC Fellowship he moved to St Andrews in 1996. Since 2004 he has been a Fellow of the Royal Society of Edinburgh. Much of his research involves the use of central research facilities and covers a wide range of topics.

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