



Oxfordshire Branch

We are very pleased to announce that this month's speaker is Dr James Anderson Chair of the Berkshire Branch of the BCS.

This month as it is summer to accompany James's talk we plan to lay on special refreshments to go with what is hopefully the good weather; Strawberries, cream and chocolate and white wine. Please come along to enjoy the strawberries and wine before the talk for what we think will be a relaxing and fascinating evening.

The evening is free. Members and non-members are very welcome.

Refreshments will be served from 7:00pm.

Extreme Parallel Computing

The Man, Machine and the Maths behind it

Speaker: **Dr James Anderson**, Lecturer in Computing, Reading University

Thursday 16th June 2011 – 7:30pm

Venue: Oxford e-Research Centre, 6 Keble Road, Oxford, OX1 3QG

Abstract: The operations of a total arithmetic can be applied to any numbers with the result being a number. Such arithmetics have no arithmetical exceptions so they can be executed in a pipeline without stalling. If a program's inner loops can be unrolled to an inline program then that program can be executed in a pipeline with a number of program runs completing each clock tick. In a practical molecular dynamics problem, 500 atom-atom interactions were computed each clock tick in a simulated 2M core machine.

The talk will begin with an introduction to transreal arithmetic and show how it can be implemented in both integer and floating-point arithmetic, with special emphasis on IEEE floating-point arithmetic. Transcomplex arithmetic, and its application to the solution of physical problems, will be discussed very briefly, before showing how to exploit the arithmetics in a massively pipelined machine.

Biography: Dr James Anderson is a lecturer in Computer Science at Reading University where he teaches discrete mathematics and compiler theory and practice. He is Chair of the Berkshire Branch of the BCS.