Investigating and enhancing students' problem-solving strategies

15 May 2013

School of Physics and Astronomy

The University of Edinburgh

Programme

10:30-10:45: Coffee and arrival

10:45-10:50: Welcome

10:50-11:00: Paul Yates (Discipline Lead for the Physical Sciences, Higher Education Academy)

11:00-11:30: *Dr. Strangecourse or: How I learned to stop worrying and love open book exams* Ross Galloway (University of Edinburgh) and Bruce Sinclair (University of St Andrews)

11:30-12:00: *Problem solving literature to pedagogy: Designing online material for an honours level physics skills course* Marsali Wallace (University of Edinburgh)

12:00-12:30: *Problem solving: does one size fit all?* Tina Overton (University of Hull)

12:30-13:30: Lunch

13:30-14:00: *Teaching problem solving skills throughout a physics degree* Peter Sneddon (University of Glasgow)

14:00-14:30: Discussion

14:30-15:00 Coffee

15:00-16:00: *Problem solving in upper-division physics: Student use of mathematics and computation* Danny Caballero (University of Colorado Boulder), via videoconference

Developing students' problem-solving ability is one of the key goals of physics courses. Substantial research has been done on elucidating expert-novice differences in problem-solving in terms of their organization of knowledge, categorization of problems, planning of solutions and metacognitive abilities. In recent years, progress has been made in teaching problem solving skills through the use of structured multi-step problem-solving strategies, collaborative group work and context-rich problems , qualitative strategies that discuss the use and application of physics principles and concepts, and a focus on particular elements of problem-solving. Progress has also been made in the assessment of student problem-solving processes using rubrics that define attainment criteria in general problem-solving areas.

This workshop will give an overview of recent developments and outcomes of physics education research into problem-solving in the UK and overseas, focusing on results that have direct relevance to physics teaching. The workshop will highlight resources available to instructors to assess and enhance students' problem-solving abilities.