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PSYCHOLOGY OF EXPERIMENTAL MATHEMATICS

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Computers provide an environment in which mathematicians can experiment. The webpage linked to this discussion paper provides some examples of that, with the aim to provoke discussion about the need for proof and the conjectural nature of experimental mathematics, and the implications that would come from classroom sessions in experimental mathematics. The relevance for the study of the psychology of mathematics education is the possibility to record and analyse the creative and social aspects of students and teachers in their engagement with unsolved mathematical problems.

The two conference sessions are structured as follows:

FIRST 60 MINUTE SESSION

- Demonstration of the ways in which computer programs allow students to generate data relevant to unsolved, but elementary, mathematical problems.
- Discussion by the participants of these examples, and others suggested by them.

SECOND 60 MINUTE SESSION:

- Discussion of issues relating to classroom experiences with experimental mathematics: positive and negative aspects of experimental mathematics; proof and explanation in experimental mathematics; how would experimental mathematics sessions run? as science prac labs, or in some other way? How could the mathematics education community provide a resource for teachers who want to run experimental mathematics sessions? (For example, like the Web Access Excellence site for biological science).
- Discussion of the cognitive and social aspects of experimental mathematics: effect on teachers and students of the authenticity of gathering and organising data on unsolved mathematical problems; development of students' language to record and describe their data and experiences; development of small group explaining.

The plan is to video tape both sessions so that the video tapes could be made available to the PME committee for distribution to the mathematics education community. In preparation for the sessions, prepared examples are available on the University of Southampton's Mathematics Education Research Group web page:

<http://www.crme.soton.ac.uk/research/expmath>