46th European Study Group with Industry, University of Bristol, 31st March – 4th April 2003

Background

The European Study Group with Industry is the UK's premier industrial mathematics problem-solving workshop, and is supported by the Smith Institute Faraday partnership and the mathematics programme of the Engineering and Physical Sciences Research Council. The Study Group was started by a group of Applied Mathematicians in Oxford over 30 years ago and at that time was unique, but today has grown to become the inspiration of many similar workshops all over the world.

Format

- First day, morning: There is a sequence of about 6 to 8 short presentations by scientists and engineers working in industry. Each of these speakers discusses an unsolved technological problem of importance to their company.
- First day (Monday) afternoon: The 60-70 university mathematician attendees break-up into teams. The academics are free to choose which problem they want to work on: many of the old hands work on several problems simultaneously! The first afternoon is mainly a brainstorming exercise plus the opportunity to grill the industrials for further details.
- Middle days, Tuesday-Thursday inclusive: Intense group-work on each of the industrial problems. Once mathematical models of each problem are written down, attempts are made at their solution by combinations of analytical and computational techniques. The practical consequences of results are always considered, and models are updated cyclically to obtain the best balance between their simplicity and completeness of description. During the middle days there are also tutorial training lectures on topical areas of industrial and applied mathematics.
- Last day (Friday) morning: Each problem team presents its results, and the industrialists are invited to comment on the progress achieved.
- Aftermath: Each team produces a short report and these are bound together in a proceedings volume.

Deliverables

The following are the minimum concrete deliverables:

- Exposure of company / problem to a network of high quality mathematical modellers.
- The production of a report outlining the problem and any progress made. This usually occurs within two months of the end of the workshop.

It is not possible to *guarantee* any outcomes beyond those listed above. Since the academics are free to work on whichever problem they choose, it is possible that some problem groups will be heavily populated and others less so. However, the organisers undertake to invite academics with a balance of skills so that in principle there is adequate expertise for each problem present at the workshop.

If a problem proves to be successful, the following may be regarded as typical "maximum outcomes":

- There may be up to 10 world experts working on the problem full time for 3 days, not including time spent in report writing.
- Novel mathematical insights may result which lead to new engineering design solutions.
- Working computer code may be produced.
- A large body of people may become interested in the problem following the conference itself, leading to e.g. new PhD sponsorship and contract research opportunities.

What is required from industrial problem presenters

- Correspondence / meetings with organisers in the lead up to the conference so that a problem area may be identified and developed into a one or two page problem description.
- Payment of a £1500 fee for each problem brought. If the problem-bringer is an SME, this fee may be substantially reduced / waived by negotiation. The problem fee does not include any accommodation costs, however, the organisers are happy to assist in finding hotels for industrial participants.
- The company must send a representative on the first day (Monday 31st March) of the workshop to present the problem and to answer questions. Rough timings: 20 minutes talk, 10 minutes questions.
- It is not necessary for the industrialist to attend the middle days (Tuesday, Wednesday, Thursday) of the workshop, although many do. However, it is preferable that the industrialist leaves email / phone contact details, in order that any further technical queries may be answered.
- It is preferable for the industrialist to return for the final morning of the workshop (on Friday 4th April) to listen to the academics speak about their results, and to make comments concerning practical applications which may help steer further work.

Intellectual property

It is not possible to bind all academic attendees at the Study Group with a single IP agreement. Therefore, the contents of industrialists' problem presentations must be considered as public domain. The problem reports produced by the academics will also be publicly circulated.

It is possible to discussions leading up to the workshop to be covered by an IP agreement. Thus the industrialist and Study Group organisers may develop together a public domain problem description which does not endanger commercial secrets.

The Study Group organisation itself lays no claim to IP which is subsquently developed from the public domain results derived at the workshop. Thus after the workshop, companies are free to negotiate IP agreements with individual academic participants.

Organiser contact details

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