

Report on the ICMS Workshop: Mathematical Population Genetics 26-31 March 2006

The emphasis of the workshop was on discussion and so we limited the number of formal lectures to three per day and focussed instead on (structured) discussion sessions. Each such session had a designated theme and was opened by an expert whose main job was to lay out some of the open problems relating to the theme. The lecture preceding the session was also devoted to the same theme. Wherever possible we ensured that the discussion leader and the lecturer comprised one biologist and one mathematician. The themes were Muller's ratchet -interpreted much more broadly as the effects of interference between many linked selective loci - (Rouzine/Chareslworth), spatially distributed populations (Law/Etheridge), sweeps versus demography (Kim/Stephan), fluctuating selection (Barton/Taylor) and genome rearrangement (Berestycki/Johnson). The remaining talks were given by Baake, Champagnat, Fearnhead, Griffiths, Brunet, Roze, Wakolbinger/Pfaffelhuber, Hermisson and Evans. There are electronic versions of almost all the talks linked to the programme of the meeting on the ICMS web page. We were delighted that participants of all ages were so generous in sharing their ideas and perspectives. We are in the process of writing a summary of the discussion sessions which we will publish as quickly as we can in an open access journal.

The aim of the workshop was to bring together mathematicians and biologists working in population genetics and ecology in an environment which would foster a lively exchange of ideas and open problems. We were particularly anxious to facilitate the communication between quantitative biologists and mathematicians. This kind of meeting can degenerate into two distinct strands, one mathematical and one biological, and as one safeguard against this we decided to limit the number of participants to forty. This also meant that we would be able to use the India Street building where the relaxed atmosphere proved especially beneficial to discussions. (One

participant remarked that ‘they felt as though they were being welcomed to our private home’.) In the event there were exactly forty participants, split almost exactly half and half between mathematicians and biologists. Just over half were young people (graduate students or postdocs) with the remainder more senior researchers.

A measure of the success of the meeting is the extremely positive responses to the questionnaires. In particular it seems that for many participants the structured discussion sessions were a real highlight. Here is a small selection of the comments:

“The workshop’s overall academic value was excellent. The choice of invitees apparently has been made with great care, but also with the courage of a high diversity, ranging from theoretical ecology and population genetics to stochastic analysis and combinatorial probability. The effort of the lecturers to present problems and to discuss the strengths and shortcomings of various techniques in a language accessible over the disciplines’ frontiers was remarkable.”

“I have attended workshops on topics similar to this before at places such as the American Institute of Mathematics in Palo Alto, California (which is run like ICMS). This workshop seemed to do a much better job of building a bridge between biologists and mathematicians and making sure that the talks and discussions were pitched at a level which could inform/inspire post-docs and graduate students who might be thinking of moving into the area.”

“Workshops like this are very important to focus mathematicians on relevant applied problems.”

“Excellent communication between people in disparate fields, which I hope will be the beginning of new collaborations.”

This hope was justified as several questionnaires did indeed report new collaborations.

Facilities and Organisational issues. The facilities at India Street were excellent and as one participant remarked “... and administration was so smooth that one did not even notice it”. The organisers would like to reiterate that point. The burden of administration fell entirely onto the ICMS staff. We are deeply indebted to them for their hard work, patience and support. There were only two criticisms of the facilities. The first was that many participants would have liked to have been able to continue their discussions in India Street later into the evening. However, they fully accepted the difficulties associated with keeping the building open and it was generally accepted that the atmosphere of the building made a great contribution to the success of the meeting. We certainly do not regret our decision to

hold the meeting in India Street. The other criticism was associated with a recurrent technical difficulty that we had with the data projector which flickered when used with some participants' laptops. When this happened we were grateful for the use of the ICMS laptop, which worked without problems. Overall, the lecture room works very well, especially in view of the historic nature of the building.

In summary, ICMS was an excellent venue for a meeting of this type and we are very grateful for the support (financial and administrative) that made this meeting possible.

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