

PROBLEMS IN GEOMETRIC GROUP THEORY

organized by

Mladen Bestvina, Tadeusz Januszkiewicz, and Richard Scott

Workshop Summary

The workshop on open problems in geometric group theory took place April 23 to April 27, 2007 at the American Institute of Mathematics. It was organized by Tadeusz Januszkiewicz, Richard Scott and Mladen Bestvina. The main goal of the workshop was to compile a list of open problems covering most aspects of geometric group theory. One of the organizers (Bestvina) has been collecting open problems for about 10 years, but as the field grew it became clear that a collective effort was required. A group of 17 leading geometric group theorists was contacted well in advance and each was asked to compile a list of problems in a particular subfield. At the workshop itself this list of subfields was modified and currently includes 23 topics.

An important feature of the problem list is that it is going to be rather dynamic and will involve participation from the whole community. To that end, a wiki form of the problem list is in the making. This effort is led by Richard Scott and a preliminary version is at <http://schubert.scu.edu/pggt>. At the moment, only the contributors and workshop participants have access to the wiki, but in its stable state the access will be much broader.

Aside from the wiki, the contributors are planning to publish a book with the problem list. It is anticipated that the wiki will probably be a more useful format for mathematicians in the field, but a book will provide a certain amount of publicity for the field.

Most of the time at the workshop the participants were divided into 2–3 groups, each of which discussed a particular topic. Each group was instructed to try to agree on a relatively short list of 4–5 problems that should be regarded as key problems in that area, and whose solutions would lead to significant progress. Each group had an appointed “leader” and a “scribe”. The notes made by the scribe were TeXed and made available to the author of the corresponding section. In the afternoons the groups reported back to the entire workshop.

This format was somewhat unusual: there were practically no lectures. Discussion sessions had fairly flexible time frames, but some sessions even ran over the allotted time. Almost everybody in each group was involved in every discussion, and as a result participants got exhausted much sooner than they would have during a regular conference. We would suggest taking Wednesday afternoons off for any similar workshops in the future.

During the group meetings and the reports, not only were new problems proposed, but some of the original problems were solved. Of course complete write ups of results may take some time.

In addition, at the end of the workshop there was a wiki session, with participants discussing the details of the wiki. It was agreed that the desirable format would be to emulate Kirby’s list of problems in low dimensional topology. This means that each section would start with a few pages of introductory material (basic definitions, references to expository

articles and standard textbooks) followed by the problems themselves. Each problem would be stated first, and this would be followed by a remark outlining the motivation, partial results and relevant references.

In the Fall 2007 there will be a program at MSRI in geometric group theory, where many of the contributors intend to continue work on the list. It is anticipated that by the end of the year the wiki will be up and running and material for the book will be ready.

Before making the wiki public, the organizers plan to give access to other experts who express interest in contributing to the project.