Combinatorial Optimization

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Abstract. This report summarizes the meeting on Combinatorial Optimization where new and promising developments in the field were discussed. The lectures show the many connections to other branches in Mathematics, like Combinatorics, Graph Theory, Geometry and Integer Programming. Furthermore, there are important connections to Theoretical Computer Science, Operations Research and an ever-growing number of application areas. Differing research directions in Combinatorial Optimization, current hot topics as well as classical streams were present in the talks. As can be seen from the table of contents, we strived for a balanced mixture of basic theoretical advancements and some selected practical applications.

Mathematics Subject Classification (2000): 90C27, 90C10, 90C11, 90C22, 90C06.

Introduction by the Organisers

For more than 30 years, meetings on Combinatorial Optimization have established a long and successful tradition at Oberwolfach. In fact, Combinatorial Optimization is a particularly active research area with links to many other areas in mathematics, e.g., to Combinatorics, Graph Theory, Geometry and Integer Programming. Furthermore, there are important connections to Theoretical Computer Science, Operations Research and many application areas. Therefore, it is not surprising that each of the meetings had its own format reflecting the most important recent developments within this scope and focusing on differing topics chosen by the respective organizers. In order to encourage such changes, a consensus emerged in the community that the organizers should vary from meeting to meeting.

Conceptually, we followed the outline of the last meeting in 2002, organized by Tom Liebling, Rolf Möhring and Uwe Zimmermann. Oberwolfach meetings are
planned a long time ahead and this one was no exception. In six focus talks, the state of the art in selected areas of high interest was demonstrated. For these presentations some internationally leading experts were approached about two months before the meeting. As was our intention, we put together a mix of senior scientists with broad experience as well as young scientists successfully pushing lines of core research with fresh ideas. In additional, we organized a series of sessions containing short talks not exceeding 25 minutes, which presented recent results. Here, we particularly encouraged young researchers to take advantage of this opportunity to present and discuss ongoing work with a broad international audience. Of course, the total number of talks had to be severely limited in order make room for the many vivid discussions within the sessions and between the sessions. We are very grateful to those who volunteered to pass on this opportunity to give a presentation. Their understanding was of great help in organizing the sessions. Furthermore, everybody had the opportunity to place a current research abstract at an appropriate message board in order to stimulate discussions.

The extended abstracts included in this report show that many differing research directions in Combinatorial Optimization, current hot topics as well as classical streams were present in the talks. In particular, the balanced mixture of basic theoretical advancements and some selected practical applications was very much welcomed by the participants.

At this point we wish to emphasize the special value which this meeting has for the Combinatorial Optimization community. The number of international conferences on Combinatorial Optimization and related topics is growing from year to year. Very attractive locations all around the world compete for such meetings. On the other hand, Oberwolfach offers the single and very well known opportunity to meet at a place optimally prepared for exchange of most recent results, for discussions of ongoing work and for joint work between the sessions. Combined with the friendly and relaxed atmosphere, these features are the basis for the success of the Combinatorial Optimization meetings at Oberwolfach. The long list of participants of this meeting and its predecessors reads as a guide to the international community of researchers in Combinatorial Optimization. Therefore, it is no surprise that many breakthrough results were initially spread at one of these meetings. Many participants arrive at the meeting well-prepared to discuss important steps in joint work with other participants. We are convinced that this meeting is one of the most important international meetings in Combinatorial Optimization.

In particular, for this particular meeting, we had a rather hard time to reduce the number of participants to the Oberwolfach meeting size. Moreover, there were surprisingly few rejections of the invitations. Nevertheless, with the help of Oberwolfach and supported by the European community, we succeeded in inviting a particularly large number of young researchers.

In our own view, and as expressed by many of the participants, the Oberwolfach workshop on “Combinatorial Optimization” was indeed a great success. This is mainly due to the excellent lectures prepared at a very high standard as well as to the many spontaneous questions and remarks discussed within the sessions. In
part, this may be seen from the included extended abstracts. We are very happy that we had the opportunity to organize this workshop at Oberwolfach. We think that Combinatorial Optimization as a central, lively research area should and will continue to be present at Oberwolfach.