

CIMPA Report

Introduction - The workshop on Recent Progress in Geometric Analysis was convened at the Institute for Studies in Theoretical Physics and Mathematics (IPM), Tehran, Iran, from May 21, 2006 to June 2, 2006. This meeting was sponsored by CIMPA with additional funding by ICTP and IMU. IPM provided local accommodations.

The idea of this meeting emerged during a meeting on nonlinear partial differential equation at IPM in December 2004. Professor El Soufi and M. Shahshahani subsequently submitted a proposal to CIMPA which was favorably received.

The workshop was structured around courses given by Gilles Carron (*Cohomology and harmonic forms on non-compact manifolds*), Bruno Colbois (*Spectrum of the Hodge-de Rham Laplacian*), Thierry Coulhon (*Heat kernels and Riesz transform*), Eaman Eftekhary (*Heegard-Floer homology; Gromov-Witten invariants*), Ahmad El Soufi (*Spectral Geometry*), Hossein Movasati (*Moduli of polarized Hodge structures*), Frank Pacard (*Singular Yamabe problem*), Alireza Ranjbar-Motlagh (*Isoperimetric inequalities, Sobolev constants and heat kernels*), Zafar Turakulov (*Singularities in General Relativity*). In additions to the courses, presentations were made on the last two days of the meeting on current research of a number of the participants. A complete schedule of the meeting is attached to this report as Appendix A.

The lectures at the meeting were given by mathematicians from Armenia (1), France (5), Iran (4), Japan (1), Switzerland (1), United States (1) and Uzbekistan (2). There were also participants from India, Iraq, Lebanon, Malaysia, Sri Lanka, and Tunisia in addition to Iran.

Rationale - While there is interest in Iran in differential geometry and partial differential equations, credible research programs in this area have not yet taken shape. This seems to be due to the lack of contact between young mathematicians in Tehran and abroad. The was expected to be a positive step in rectifying this problem by precisely isolating areas and problems which are reasonably expected to lead to fruitful research. In this way a working relationship with specialists in Europe and elsewhere will be established.

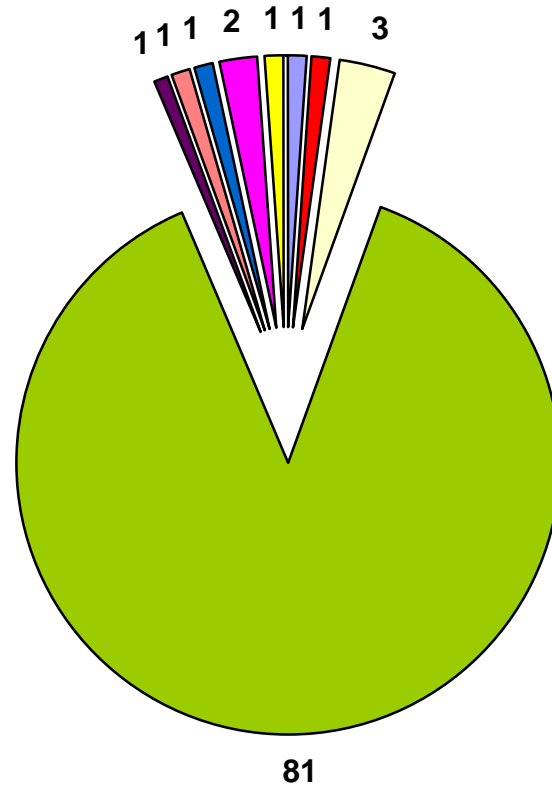
The main objectives of the school were:

1. To provide an introduction to some current problems in Geometric Analysis for young researchers and postgraduate students and present recent advances and perspectives in these topics for more specialized researchers
2. To promote exchanges and collaborations between mathematicians from Iran and those from neighboring countries and to encourage the establishment of professional relationships and collaborative research between mathematicians from the region and experts from Europe.

Future Activities - An important component of a successful research program is the participation of advanced students. Because of isolation of Iran from the international mathematical community and since interaction with a large spectrum of mathematical activity is essential for successful research in geometry and partial differential equations, it has been difficult to encourage students to participate in research in this field. The ingredients for creating an environment conducive to international participation are in place now. Following the Geometric Analysis meeting, Dr. Bahraini decided to teach an advanced one year course on Differential Geometry at Sharif University. In this course he intends to discuss various topics that were discussed at the meeting with special emphasis on analytical methods. The purpose of the course is to introduce graduate students to some current areas of research. M. Shahshahani and some members of the department of mathematics at Sharif will/are expected to cooperate in the instruction and organization of this course.

In addition to geometric analysis a major meeting on Automorphic Forms and Number Theory is scheduled for December 2006 at IPM. A number of distinguished mathematicians have already accepted the invitation to attend this meeting. The development of this area of research is especially important in Iran because a number of Iranian mathematicians who reside in the United States or Europe specialize in various aspects of this field and cooperation with them should have a very significant impact on Iranian mathematics.

Répartition par nationalité des participants à l'école
"Progrès récents en Analyse Géométrique", Teheran (Iran), 20 mai -2 juin 2006



ALGERIE	1
INDE	1
IRAK	3
IRAN	81
LIBAN	1
MALAISIE	1
MAROC	1
TUNISIE	2
SRI LANKA	1
TOTAL = 92	