ICTP – The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy

smr1312/Announcement

UNITED NATIONS EDUCATIONAL SCIENTIFIC AND CULTURAL ORGANIZATION
and
INTERNATIONAL ATOMIC ENERGY AGENCY

THE ABDUS SALAM INTERNATIONAL CENTRE FOR THEORETICAL PHYSICS

Strada Costiera 11 Telephone: +39-040-2240111
I-34014 Trieste Telex: 460392 ICTP I
Italy Telefax: +39-040-224163

SCHOOL ON HIGH-DIMENSIONAL MANIFOLD TOPOLOGY

21 May - 8 June 2001

Miramare, Trieste, Italy

Supported by the European Commission, Research DG, Human Potential Programme,
High Level Scientific Conferences HPCF-CT-2000-00342

Co-sponsored by the U.S. National Science Foundation

The Abdus Salam International Centre for Theoretical Physics (ICTP), in conjunction with its mathematical theme of the year 2001, Topology and Dynamical Systems, is organizing a School on High-Dimensional Manifold Topology from 21 May to 8 June 2001. It will be directed by F.T. Farrell (State University of New York at Binghamton, USA) and W. Lueck (Westfaelische Wilhelms-Universitaet Muenster, Germany).

The classification of manifolds has been one of the most important reseach areas in mathematics in the last four decades. The aim of this School is both to give young mathematicians the possibility to learn the basic results and most important techniques which come from various areas such as topology, geometry, K-theory and operator theory, and to present the most recent developments and results.

In the fifties and sixties a good understanding of simply-connected high-dimensional manifolds was achieved. The key obstacle in the non-simply connected case is the calculation of certain algebraic invariants in K- and L-theory. In the last decade significant progress has been made. In particular the Farrell-Jones Isomorphism Conjecture in algebraic K-theory and L-theory and the related Borel Conjecture have led to a better understanding of the case of aspherical manifolds of dimension >= 5. They have been proven for a large class of groups arising from geometry. The aim of this School is to present this exciting development, including the latest spectacular results.

PROGRAMME

The first two weeks of the School will consist of a series of

lectures which are addressed to both young mathematicians wishing to enter this research area, and to established mathematicians whose field of interest is not identical but connected to the topic of the School. All these lectures will be given by outstanding representatives of the field.

Topics to be covered will include:

- Surgery theory
- Algebraic K- and L-theory
- Homotopy groups of the group of diffeomorphisms resp. homeomorphisms of a closed manifold
- Controlled topology
- Isomorphism Conjecture in algebraic K- and L-theory, Borel Conjecture, Novikov Conjecture, Baum-Connes Conjecture
- Exotic aspherical manifolds

The lecturers for the School of the first two weeks will include:

M. Davis (Ohio State University, Columbus, USA)
F.T. Farrell (SUNY Binghamton, USA)
T. Goodwillie (Brown University, USA)
I. Hambleton (McMaster University, Canada)
L. Jones (SUNY Stony Brook, USA)
W. Lueck (Universitaet Muenster, Germany)
F. Quinn (Virginia State University, Blacksburg, USA)
A. Ranicki (University of Edinburgh, UK)
T. Schick (Universitaet Muenster, Germany)
S. Stolz (University of Notre Dame, USA)

The following lectures are planned:

1. Exotic aspherical manifolds (M. Davis)
(a) Davis' construction of closed aspherical manifolds using Coxeter groups, where M is not triangulable and the universal cover of M is not R^n
(b) Reduction of the Novikov and Borel Conjectures for aspherical complexes to aspherical manifolds
(c) Gromov's hyperbolization technique and the relation of piecewise flat CAT(0)-manifolds to non-positively curved Riemannian manifolds

2. The Borel Conjecture (F.T. Farrell)
(a) Introduction to high-dimensional manifold topology
(b) Asymptotic and focal transfer
(c) The vanishing of Wh(π_1(M)) for non-positively curved manifolds using the geodesic flow
(d) Proof of the Borel Conjecture for non-positively curved manifolds
(e) Stable calculation of π_n(Top(M)) and π_n(Diff(M)) for non-positively curved manifolds

3. Homeomorphism and diffeomorphism groups (T. Goodwillie)
(a) Construction of A-theory and the Additivity Lemma
(b) Relation of A-theory to pseudo isotopy spaces, Quillen's higher K-theory and diffeomorphism groups, Igusa's stability theorem for pseudo isotopy spaces
(c) Calculations of pseudo isotopy spaces of simply-connected manifolds
(d) Survey on the proof of the Novikov Conjecture in K-theory for finite aspherical complexes by Boekstedt, Hsiang and Madsen

4. Classical algebraic K- and L-theory and relations to topology (I. Hambleton)
(a) Survey of computations of K_n(ZG) for n =<1 and L_n(ZG) for finite G
(b) The assembly map for finite fundamental groups and surgery obstructions

on closed manifolds
(c) A survey of the spherical space form problem
(d) Introduction to bounded K− and L−theory: Finite group actions on spheres and non−linear similarity

5. Foliated control theory (L. Jones)
(a) Foliated control theory for pseudo−isotopies and h−cobordisms
(b) Surgery theory in the controlled setting
(c) The relation of the structure set of M and the one of M x D^4 and the δ−approach to surgery theory
(d) Open manifolds with bounded curvature assumptions

6. Surgery theory (W. Lueck)
(a) The s−cobordism theorem, Whitehead torsion and Whitehead group
(b) Normal maps, the π−π−theorem and the geometric formulation of the exact surgery sequence
(c) Algebraic description of L−groups and the homotopy theoretic interpretation of normal maps in terms of G/O
(d) Classification of homotopy spheres
(e) Assembly maps in K− and L−theory, Formulations of Isomorphism Conjectures, Connections to the Borel Conjecture
(f) Computations of K− and L−groups of group rings of certain classes of groups

7. Pseudo−isotopy spectrum and controlled theory (F. Quinn)
(a) Geometric modules
(b) Local contractibility of homeomorphism groups and the thin h−cobordism theorem
(c) Atiyah−Hirzebruch type spectral sequence for the controlled pseudo isotopy spectrum
(d) Homology manifolds

8. Algebraic surgery (A. Ranicki)
(a) Foundations of algebraic surgery
(b) The structure set of arbitrary spaces, the algebraic surgery sequence and the total surgery obstruction
(c) Circle−valued Morse theory and Novikov homology

9. Operator algebras and topology (T. Schick)
(a) Index theory and C*−algebras and the Baum−Connes Conjecture
(b) A counterexample to the unstable Gromov−Lawson−Rosenberg Conjecture
(c) L^2−cohomology and the conjectures of Atiyah, Singer and Hopf

10. Manifolds with positive scalar curvature (S. Stolz)
(a) Survey on the problem of finding a positive scalar curvature metric on a closed Riemannian manifold
(b) Stolz' proof of the Gromov−Lawson Conjecture in the simply connected case
(c) The Gromov−Lawson−Rosenberg conjecture and its relation to the Baum−Connes conjecture
(d) Survey on the problem of finding a positive Ricci curvature metric on a closed Riemannian manifold

The highlight of the event will be a high−level Conference during the third week, where current research and latest new results and developments in the field will be presented by experts. The material of the first two weeks is designed to have prepared participants for the Conference. The speakers and lectures for this Conference will be chosen shortly before it takes place, in order to be able to take the most recent developments into account.

PARTICIPATION

Mathematicians from all countries that are members of the UN, UNESCO or IAEA can attend the School. The main purpose of the Centre is to help research workers from developing countries through a programme of training activities within a framework of international cooperation. However, students and post−doctoral scientists from developed countries are also welcome to attend. As the School will be conducted in English, participants should have an adequate working knowledge of that language. Participants should preferably have completed some years of study and research after a first degree.

As a rule, all expenses of the participants should be borne by the home institution. However, a limited number of financial grants are available for participants from developing countries, as well as some for young researchers of the European Union (see over). As scarcity of funds allows travel to be granted only in few exceptional cases, every effort should be made by candidates to secure support for their fares (or at least half of their fares) from their home country.

There is no registration fee for participation in the School.

Graduate and doctoral students should include with their application two letters of recommendation.

****

EC GRANTS FOR YOUNG RESEARCHERS FROM THE EUROPEAN UNION ASSOCIATED STATES

A generous contribution from the European Commission, within the framework of its Human Potential Programme (High−Level Scientific Conferences), will make it possible to provide financial support (subsistence and/or travel) for some young researchers working in or from the European Union* or Associated States** who both qualify for the School and satisfy the Age and Residence Criteria.

Age Criterion
Young researchers are researchers up to an age limit of 35 years at the time of the event. Allowance will be made for compulsory military or civil service (actual time spent in military or civil service) and childcare (maximum 2 years per child for the actual time spent off work).

Residence Criterion
Young researchers who are nationals of a Member State of the European Union or an Associated State, including those who at the time of the event are active in institutions outside Member States and Associated States.

Nationals of third countries (i.e. neither Member States nor Associated States) are eligible if they have been residing in a Member State of the European Union for at least the last 5 years prior to the starting date of this activity.

Eligible young researchers who wish to apply for a grant should complete and return the attached Request for Participation form by 31 December 2000.

*Member States of the European Union
Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

**Associated States
Bulgaria, Republic of Cyprus, Czech Republic, Estonia, Hungary, Iceland, Israel, Latvia, Liechtenstein, Lithuania, Norway, Poland, Romania, Slovakia

and Slovenia. (Subject to its final conclusion, the Association Agreement signed with the Swiss Federation is expected to enter into force on 1 January 2001.) Latest information on entry into force of agreements is available on www.cordis.lu/fp5/src/3rdcountries.htm.)
****

The closing date for submitting requests for participation is 31 December 2000. The decision of the organizers will be communicated to all candidates as soon as possible thereafter.

The "Request for Participation" form, to be found appended to the Bulletin (obtainable also via electronic mail: smr1312@ictp.trieste.it, using as Subject: get announcement, or via WWW server: http://www.ictp.trieste.it/) should be completed, signed, photocopied twice and mailed − in triplicate − to:

The Abdus Salam International Centre for Theoretical Physics
School on High−Dimensional Manifold Topology
(c/o Ms. A. Bergamo)
Strada Costiera 11
I−34014 Trieste
Italy

Telephone: +39 − 040 − 2240201
Telefax: +39 − 040 − 2240490
e−mail: smr1312@ictp.trieste.it

==========end of bulletin==========

PLEASE DETACH HERE

NOTE: Better resolution if printed using Courier 10

==========

UNITED NATIONS EDUCATIONAL SCIENTIFIC AND CULTURAL ORGANIZATION
and
INTERNATIONAL ATOMIC ENERGY AGENCY

THE ABDUS SALAM INTERNATIONAL CENTRE FOR THEORETICAL PHYSICS

Strada Costiera 11 Telephone: +39−040−2240111
I−34014 Trieste Telex: 460392 ICTP I
Italy Telefax: +39−040−224163

REQUEST FOR PARTICIPATION

School on High−Dimensional Manifold Topology

21 May − 8 June 2001

e−mail: smr1312@ictp.trieste.it

INSTRUCTIONS

Each question must be answered clearly and completely. Type or print in ink. If more space is required, attach additional pages. The completed application form AND 2 photocopies of it should be sent to:

The Abdus Salam International Centre for Theoretical Physics
School on High−Dimensional Manifold Topology

(c/o Ms. A. Bergamo)
Strada Costiera 11
I−34014, Trieste, Italy
to arrive no later than 31 December 2000.

==========

GRADUATE AND DOCTORAL STUDENTS SHOULD INCLUDE TWO LETTERS OF RECOMMENDATION.

IMPORTANT: Application forms sent via e−mail will be accepted ONLY when the deadline is imminent. The file should be sent as attachment, in RTF format. In any case, a signed hard copy must follow by post.

A recent photograph
of the candidate should
be attached here,signed
legibly on the reverse.

NOTE: This request will be processed only if the permanent address (and present address, if different) is clearly indicated. The ICTP cannot process any visa request, unless all requested personal data are provided.

P E R S O N A L D A T A

For women only
(if applicable)
SURNAME/FAMILY Name: MAIDEN Name: First Name: Middle Name(s): Sex:

IMPORTANT: PLEASE ALSO COMPLETE THIS SECTION, IF YOUR NAMES IN YOUR PASSPORT ARE SPELT DIFFERENTLY FROM THE ABOVE.

For women only
(if applicable)
SURNAME/FAMILY Name: MAIDEN Name: First Name: Middle Name(s):

Place of birth (City and Country):

Present nationality:

Date of birth: Year − Month − Day

Full address of permanent Institution:

Institute: Tel. No.:
Telex/Cable:
Telefax:

Your Office: Tel. No.:
Telefax:
e-mail *:

Full address of present Institution (if different from permanent):

Institute: Tel. No.:
Telex/Cable:
Telefax:

Your Office: Tel. No.:
Telefax:
e-mail *:

until: Date .....

(*) My e-mail address(es) may be made public on the ICTP WWW pages:

YES /__/ NO /__/

Home address: Tel. No.

Mailing address - please indicate whether:

Permanent /__/ Present /__/ Home /__/

Name and address of person to notify in case of emergency - Relationship:

Tel. No.:

EDUCATION (higher degrees)

University or equivalent Name and place	Years attended From	to	Degrees

---

Seminars, summer schools, conferences or research

Name and place Year

SCIENTIFIC EMPLOYMENT AND ACADEMIC RESPONSIBILITY

Research Institution or University Name and place	Period of duty From	to	Academic responsibilities

Present employment and duties, and foreseen employment upon return to home country after the activity:

Have you participated in past ICTP activities? If yes, which?

YES /__/ NO /__/

Are you applying to any other 2001 ICTP activities? If yes, which?

YES /__/ NO /__/

Mention briefly your previous research experience, and explain your reasons for wishing to participate in this activity:

NB: Our Scientific Information System keeps track of all applications made by the candidate to earlier ICTP activities. As a consequence, when the subject of the present activity is far from your previous applications, an explanation (not more than 200 words) of your change of interest should be included.

PRESENT FIELD OF INTEREST (please indicate on the list below your TWO primary fields of interest, in order of priority, 1 and 2).

10. PHYSICS OF CONDENSED MATTER

- 11. Solid State Physics
- 12. Atomic and Molecular Physics
- 13. Materials Science
- 14. Surfaces and Interfaces
- 15. Statistical Physics
- 16. Computational Physics in Condensed Matter

20. PHYSICS OF HIGH AND INTERMEDIATE ENERGIES

- 21. High Energy and Particle Physics
- 22. Relativity, Cosmology Astrophysics
- 23. Plasma Physics
- 24. Nuclear Physics

30. MATHEMATICS

- 31. Applicable Mathematics including:
  - Mathematical Ecology,
  - Systems Analysis,
  - Mathematical Economy
  - Mathematics in Industry
- 33. Algebra
- 34. Geometry
- 35. Topology
- 36. Differential Equations
- 37. Analysis
- 38. Mathematical Physics

40. PHYSICS AND ENERGY

- 41. Physics of Nuclear Reactors
- 42. Physics of Controlled Fusion
- 43. Non-Conventional Energy (Solar, Wind and others)
- 44. Nuclear Energy related technologies

50. PHYSICS AND ENVIRONMENT

- 51. Solid Earth Geophysics
- 52. Soil Physics
- 53. Climatology and Meteorology
- 54. Physics of the Oceans
- 55. Physics of Desertification
- 56. Physics of the Atmosphere, Troposphere Magnetosphere, Aeronomy
- 57. Environmental Monitoring and Remote Sensing

60. PHYSICS TEACHING

- 61. English
- 62. French
- 63. Spanish
- 64. Arab

80. MISCELLANEOUS

- 81. Others
- 82. Digital Communications Computer Networking

90. PHYSICS OF THE LIVING STATE

- 91. Neurophysics
- 92. Biophysics
- 93. Medical Physics

AO. APPLIED PHYSICS

- A1. Physics in Industry
- A2. Microelectronics
- A3. Fibre Optics for Communications
- A4. Instrumentation
- A5. Synchrotron Radiation
- A6. Non-destructive Evaluation
- A7. Lasers
- AA. Applied Superconductivity

B1. SPACE PHYSICS

Kindly supply a keyword description of your current scientific activities, as

follows (strictly within indicated lengths) :

1) Area of research: (e.g. TOPOLOGY)

/_____/
(no more than 15 characters)

2) Specific topic of interest: (e.g. SURGERY THEORY)

/_____/
(no more than 30 characters)

List your scientific publications including books and articles
(authors, title, Journal) in the period 1993−2000:

Kindly state any positions you hold in the scientific administration of
your Institution or any of the national scientific Institutions.

Indicate below your proficiency in the English language

Reading: Good /__/ Average /__/ Poor /__/

Writing: Good /__/ Average /__/ Poor /__/

Speaking: Good /__/ Average /__/ Poor /__/

APPLICABLE ONLY FOR CANDIDATES FROM DEVELOPING COUNTRIES

(Important: Owing to limited funds, support for travel will be granted
only in exceptional cases. Therefore, every effort should be made by
applicants to secure support for their fare (or at least a partial
contribution) from their home country).

Request for Financial Assistance: (Please tick ONE box only)

/__/ Full Travel + Subsistence /__/ Subsistence only

/__/ Half Travel + Subsistence /__/ No financial support requested

I certify that if granted funds by ICTP for my travel, I shall attend the whole activity

.....
Signature

I certify that the statements made by me above are true and complete. If accepted, I undertake to refrain from engaging in any political or other activities which would reflect unfavourably on the international status of the ICTP. I understand that any breach of this undertaking may result in the termination of the arrangements relating to my visit at the Centre.

_____ _____
Signature of applicant Date

==========

TO BE COMPLETED ONLY BY ELIGIBLE YOUNG RESEARCHERS OF THE EUROPEAN UNION OR ASSOCIATED STATES WISHING TO APPLY FOR A EUROPEAN COMMISSION GRANT

Do you or your research group hold a grant from which participation in the event could be funded?

Yes /__/ No /__/

Have you applied for a grant for this purpose from any other body?

Yes /__/ No /__/

If yes, what was the outcome of your application?

I wish to apply for a European Commission grant to attend the event.

I am requesting support for:

(Please tick ONE box only)

- Half Travel + Subsistence /__/
- Full Travel + Subsistence /__/
- Subsistence only /__/

If requesting support for travel expenses, please also provide the information requested below.

Estimated costs of travel to Trieste (using the most economical air or second class rail fare):

From	To	Means of Transport	Return/Single	Cost

I declare the above statements to be truthful and sincere. I do not expect to be funded for participation in the event from other sources except as specified above, and that if awarded a grant by the organizers of the event, I will not cover any expenses from more than one funding source.

Signed: ..... Date: .....

I certify that the statements made by me above are true and complete. If accepted, I undertake to refrain from engaging in any political or other activities which would reflect unfavourably on the international status of the ICTP. I understand that any breach of this undertaking may result in the termination of the arrangements relating to my visit at the Centre.

_____ _____

Signature of applicant Date

==========end of application==========

BACK to ICTP smr1312