

ICTP – [The Abdus Salam International Centre for Theoretical Physics](#), Trieste, Italy

smr1327/Announcement

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

THE ABDUS SALAM INTERNATIONAL CENTRE FOR THEORETICAL PHYSICS

Strada Costiera 11
I-34014 Trieste
Italy

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Telex: 460392 ICTP I
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SUMMER SCHOOL ON MATHEMATICAL CONTROL THEORY

3 - 28 September 2001

Miramare, Trieste, Italy

Co-sponsored by Conselho Nacional de Desenvolvimento Científico
e Tecnológico (CNPq), Brazil

Directors:

- A. Agrachev (SISSA, Trieste and Steklov Institute, Moscow)
- B. Jakubczyk (Polish Academy of Sciences, Warsaw)
- C. Lobry (Institut National de Recherche Agronomique, Montpellier)

The Abdus Salam International Centre for Theoretical Physics (ICTP) is organizing a Summer School on Mathematical Control Theory from 3 to 28 September 2001. It is intended to be the first of a series of schools on this topic.

Mathematical Control Theory is a rapidly growing field which provides strict theoretical and computational tools for dealing with problems arising in electrical and aerospace engineering, automatics, robotics, applied chemistry, biology etc.

It is well known that automatic control is very useful for the regulation of many industrial processes, especially in "high-tech" industries such as aeronautics or robotics. Less known is the fact that control methods are involved in questions pertaining to the development of countries in the South, such as wastewater treatment, agronomy, epidemiology, population dynamics, control of industrial and natural bio-reactors. Since most of these natural processes are highly nonlinear, the tools of nonlinear control are essential for the modelling and control of such processes.

At present regular courses in Mathematical Control Theory are rarely included in the curricula of universities, and very few researchers receive enough background in this field. It therefore seems useful to organize specific activities in the form of schools to provide the necessary background for those embarking on research in this field.

PROGRAMME

The first of this planned series of schools will consist of several courses and minicourses intended to provide an introduction to topics of Mathematical Control Theory. It will include introductory courses on Linear Control Theory (finite and infinite-dimensional), Nonlinear Control Theory, and Optimal Control.

The topics to be covered by these courses and minicourses will include:

- Controllability and motion planning
- Observability and observers
- Stabilization and feedback equivalence
- Optimal control problems
- Control of hydrodynamical systems

The last week will concentrate on applications of Control Theory, especially those which are important for the development of non-industrialized countries.

Preliminary list of speakers:

- A. Agrachev (SISSA, Trieste and Steklov Institute, Moscow)
- A. Bacciotti (Politecnico di Torino)
- G. Bastin (CESAME, Louvain-la-Neuve)
- O. Bernard (INRIA, Sophia Antipolis)
- M. Coron (Universite' Paris Sud, Orsay)
- G. Da Prato (Scuola Normale Superiore, Pisa)
- H. Frankowska (CEREMADE, Paris)
- J.-P. Gauthier (Universite' de Bourgogne, Dijon)
- B. Jakubczyk (Polish Academy of Sciences, Warsaw)
- M. Kawski (University of Arizona, Tempe)
- C. Lobry (Institut National de Recherche Agronomique, Montpellier)
- R. Montgomery (University of California, Santa Cruz)
- W. Respondek (INSA, Rouen)
- P. Rouchon (Ecole des Mines, Paris)
- G. Sallet (University of Metz INRIA, France)
- J.-P. Steyer (Institut National de Recherche Agronomique, Narbonne)
- J. Zabczyk (Polish Academy of Sciences, Warsaw).

The School is intended primarily for mathematicians and mathematically oriented engineers at the beginning of their career. The typical participant is expected to be a graduate student or young post-doctoral researcher interested in Mathematical Control Theory. It will be assumed that the participants have sufficient background in Ordinary Differential Equations and Advanced Calculus.

Before returning to their home countries participants will receive appropriate material for further study.

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

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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 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.

POSSIBLE EUROPEAN COMMISSION GRANTS FOR YOUNG EUROPEAN RESEARCHERS

There may be a possibility to provide support for young researchers (max. 35 years) who are nationals of a Member State of the European Union* or an Associated State**.

Eligible young researchers who are interested in applying for such support, in the event that this is possible, should complete and return - by 31 March 2001 - the attached Request for Participation form.

*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. 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 March 2001. 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 this Bulletin (obtainable also via electronic mail: smr1327@ictp.trieste.it, using as Subject: get announcement, or via WWW server: <http://www.ictp.trieste.it/>) should be completed, signed, and mailed to:

The Abdus Salam International Centre for Theoretical Physics
Summer School on Mathematical Control Theory
(c/o Ms. A. Bergamo)
Strada Costiera 11
I-34014 Trieste
Italy

Telephone: +39 - 040 - 2240201
Telefax: +39 - 040 - 2240490
e-mail: smr1327@ictp.trieste.it

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PLEASE DETACH HERE

NOTE: Better resolution if printed using Courier 10

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REQUEST FOR PARTICIPATION

Summer School on Mathematical Control Theory

3 - 28 September 2001

e-mail: smr1327@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 should be sent to:

The Abdus Salam International Centre for Theoretical Physics
Summer School on Mathematical Control Theory
(c/o Ms. A. Bergamo)
Strada Costiera 11
I-34014, Trieste, Italy
to arrive no later than 31 March 2001.

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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

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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 /___/

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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 | 60. PHYSICS TEACHING |
| 11. Solid State Physics | 61. English |
| 12. Atomic and Molecular Physics | 62. French |
| 13. Materials Science | 63. Spanish |
| 14. Surfaces and Interfaces | 64. Arab |
| 15. Statistical Physics | |
| 16. Computational Physics in Condensed Matter | 80. MISCELLANEOUS |
| 20. PHYSICS OF HIGH AND INTERMEDIATE ENERGIES | 81. Others |
| 21. High Energy and Particle Physics | 82. Digital Communications Computer Networking |
| 22. Relativity, Cosmology Astrophysics | |
| 23. Plasma Physics | |
| 24. Nuclear Physics | 90. PHYSICS OF THE LIVING STATE |
| | 91. Neurophysics |
| | 92. Biophysics |
| | 93. Medical 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
- 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. DIFFERENTIAL EQUATIONS)

/_____/

(no more than 15 characters)

2) Specific topic of interest: (e.g. CONTROL 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

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

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):

Table with 5 columns: From, To, Means of Transport, Return/Single, Cost. The table body is mostly empty with dashed lines.

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=====

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