

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

## **smr1325/Announcement**

WORKSHOP ON

HYBRID NUCLEAR SYSTEMS FOR ENERGY PRODUCTION, UTILISATION  
OF ACTNIDES TRANSMUTATION OF LONG-LIVED RADIOACTIVE WASTE

3 - 7 September 2001

followed by

WORKSHOP ON

NUCLEAR DATA FOR SCIENCE TECHNOLOGY: ACCELERATOR  
DRIVEN WASTE INCINERATION

10 - 21 September 2001

Miramare - Trieste, Italy

Two consecutive Workshops will be organized by the Abdus Salam International Centre for Theoretical Physics (ICTP) and the International Atomic Energy Agency (IAEA) from 3 to 21 September 2000. The organizers of the Workshop will be Dr. Michal Herman (IAEA, Vienna, Austria), Dr. Alberto Mengoni (ENEA, Bologna, Italy) and Dr. Alexander Stanculescu (IAEA, Vienna, Austria). The local organiser is Dr. N. Paver (Istituto Nazionale di Fisica Nucleare and ICTP Trieste).

Significant efforts to develop high-power accelerator driven systems are under way in many countries including China, the European Union, India, Japan, Russia, and the US. One important application of this type is a sub-critical reactor in which the reaction chain is sustained by external neutrons from a spallation source. For such a reactor intrinsic safety features are claimed. This system would be able to transmute long-lived radioactive waste nuclides into harmless or shorter-lived products. This would relax requirements for the waste disposal that is a major concern in the current application of nuclear energy.

The objective of the Workshops is to familiarize the students with the status of the research and development activities regarding accelerator driven systems and to stimulate nuclear data activities by training young scientists in the understanding, production and use of the relevant nuclear data. The Workshops will consist of lectures, computer demonstrations and 'hands-on' exercises with computer codes and on-line retrieval of nuclear data. Time will be provided for seminars and panel discussions. The participants are invited to prepare half-page abstracts of their intended oral presentations. The selection of the presentations will be done during the Workshop.

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WORKSHOP ON NUCLEAR DATA FOR SCIENCE AND TECHNOLOGY:

ACCELERATOR DRIVEN WASTE INCINERATION

Design of the accelerator driven system (ADS) requires knowledge of nuclear data for simulation of the spallation process, radiation heating and damage, criticality and transmutation rates. The data are needed also for energies above 20 MeV - a typical limit for standard nuclear-reactor oriented data libraries. Development of the appropriate libraries has started only recently. Many ADS-related measurements of nuclear reaction cross sections are being performed or planned for the near future. Results of recent experiments will have to be stored, evaluated, formatted and processed to be useful for technical design. Theoretical modelling of nuclear reactions will be essential in the evaluation phase. Existing nuclear data evaluation activities are limited in comparison with the actual needs, especially in the energy range between 20 and 200 MeV, which remains relatively unexplored. The participants will be familiarized with the modern theoretical models used to predict nuclear reaction cross sections. They will learn principles of evaluation methodology and become acquainted with the existing data libraries and highlights of data processing. The programme of the Workshop will cover the following topics:

Nuclear data in ADS design

Impact of data uncertainties on core performance, structure  
damage and shielding

Experimental activities related to nuclear data development

Theory of nuclear reactions below 200 MeV (statistical and  
preequilibrium models, level densities)

Theory of nuclear reactions above 200 MeV

Nuclear data libraries

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WORKSHOP ON HYBRID NUCLEAR SYSTEMS FOR ENERGY PRODUCTION, UTILIZATION  
OF ACTINIDES AND TRANSMUTATION OF LONG-LIVED RADIOACTIVE WASTE

Important research and development (R)programmes are being undertaken by various institutions in many countries to substantiate the claims made with regard to the advantages of the ADS (i.e., intrinsic low waste production, high transmutation capability, enhanced safety characteristics and better long-term resources utilization [e.g. with thorium fuels]) and to advance the basic knowledge in this innovative area of nuclear energy development. While long-term objectives for developing novel nuclear systems for energy production and transmutation may not be unanimously agreed upon by the different groups participating in this effort, it is clear that the short-term goals are similar. The ongoing RDwork reflects these shared short term objectives geared towards "road-mapping" activities that will substantiate the overall technological claims made for the ADS and eventually provide the basis for the decision whether to embark or not on national or co-ordinated "ADS Demonstrator" projects. The RDtopics involved can be categori

the following RDareas:

General concept and system studies

Accelerator

Target

Sub-critical core

Fuel development

Fuel cycle studies

A review of the ADS designs presently under consideration will be given. The participants will study the theoretical foundation of ADS design work, identify the most problematic areas, as well as the limitations of the simulation methods presently used. Based on the discussion of the impact of the present uncertainties on the performance of the ADS, the needs for data and methods development and validation work will be identified.

### III. PARTICIPATION

Scientists and students from all countries that are members of the UN, UNESCO or IAEA can attend both Workshops. Participants should hold a university degree in nuclear physics, nuclear chemistry, nuclear

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engineering or related subjects and have several years of professional experience related to applications of nuclear technology. They are expected to apply acquired knowledge through teaching and working in their home countries. 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 this activity will be conducted in English, participants should have an adequate working knowledge of that language.

As a rule, travel and subsistence expenses of the participants should be borne by the home institutions. Limited funds are available for some scientists 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-fare) from their home country. It is stressed that participants whose travel expenses are paid by the ICTP are required to attend both Workshops. There is no registration fee for attending the Workshops.

The closing date for requesting participation is 16 March 2001. The "Request for Participation" form, (also obtainable via e-mail: smr1325@ictp.trieste.it and/or smr1326@ictp.trieste.it and by typing on the subject line "get Announcement", or via the ICTP Web Server: <http://www.ictp.trieste.it/>),

should be completed, signed and sent to:

Workshops on Nuclear Waste

(c/o Ms. E. Brancaccio)

Strada Costiera 11

I-34014 Trieste

Italy

Telephone: +39-040-2240284 e-mail: SMR1325@ictp.trieste.it

Telefax: +39-040-224163 e-mail: SMR1326@ictp.trieste.it

<http://www.ictp.trieste.it/>

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UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION

and

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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  
E-mail: SMR1325@ictp.trieste.it  
E-mail: SMR1326@ictp.trieste.it

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REQUEST FOR  
PARTICIPATION

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WORKSHOP ON HYBRID NUCLEAR SYSTEMS FOR ENERGY PRODUCTION,  
UTILISATION OF ACTNIDES TRANSMUTATION OF LONG-LIVED RADIOACTIVE  
WASTE

and

WORKSHOP ON NUCLEAR DATA FOR SCIENCE TECHNOLOGY:  
ACCELERATOR DRIVEN WASTE INCINERATION

3 - 21 September 2001

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INSTRUCTIONS

Each question must be answered clearly and completely. Type or print in ink. If more space is required, attach additional pages. This form should be forwarded to: the Abdus Salam International Centre for Theoretical Physics, Workshops on Nuclear Waste (c/o Ms. E. Brancaccio)

Strada Costiera 11, I-34014, Trieste, Italy,

to arrive no later than 16 March 2001.

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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.

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P E R S O N A L   D A T A

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SURNAME/FAMILY Name:      MAIDEN Name:      First name:      Middle  
name(s):

For women only  
(if applicable)

Sex:

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IMPORTANT: PLEASE ALSO COMPLETE THIS SECTION, IF YOUR NAME(S) IN YOUR  
PASSPORT ARE SPELT DIFFERENTLY FROM THE ABOVE.

SURNAME/FAMILY Name:      MAIDEN Name:      First name:      Middle  
name(s):

For women only  
(if applicable)

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Place of birth (City and Country):      Present nationality:

Date of birth:

Year - Month - Day

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Full name/address of permanent Institution:

Institute: Tel. No.  
Telex/Cable  
Telefax  
Your Office: Tel. No.  
Telefax  
E-mail\*:

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

Institute: Tel. No.  
Telex/Cable  
Telefax  
Your Office: Tel. No.  
Telefax:  
E-mail\*:  
until: Date .....

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Home address: Tel. No.

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Mailing address - please indicate whether:  
Permanent ( ) Present ( ) Home ( )

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Name and address of person to notify in case of emergency -  
Relationship: Tel. No.

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\* I agree that my e-mail address(es) may be made public on the ICTP WWW





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Have you participated in past ICTP activities:      Yes \_\_\_                      No  
—

If yes, which?

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 his/her previous applications,

an explanation (not more than 200 words) of his/her change of interest should be included.

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Present field of interest:

(please indicate on the list below - up to 5 fields - underlining primary field)

- |   |                     |
|---|---------------------|
| 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<br>Condensed Matter | 80.MISCELLANEOUS    |
|   | 81.Others .....     |

20. PHYSICS OF HIGH AND INTERMEDIATE ENERGIES
21. High Energy and Particle Physics
22. Relativity, Cosmology and Astrophysics STATE
23. Plasma Physics
24. Nuclear Physics
30. MATHEMATICS
31. Applicable Mathematics including:  
Mathematical Ecology  
System 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)
50. PHYSICS AND ENVIRONMENT
82. Digital Communications  
and Computer Networking
90. PHYSICS OF THE LIVING
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

- 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
- 

Kindly supply a keyword description of your current scientific activities,

as follows (strictly within indicated lengths):

1) Area of research:

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(no more than 15 characters)

2) Specific topic of interest:

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(no more than 30 characters)

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List your recent scientific publications including books and articles  
(authors, title, Journal) in the period 1996-2000:

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

If appropriate, especially for junior physicists, it would be of assistance to the Selection Committee if this request for participation were accompanied by a letter of recommendation.

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Indicate below your proficiency in the English language

Reading:Good	___	Writing:Good	___	Speaking:Good	___
Average	___	Average	___	Average	___
Poor	___	Poor	___	Poor	___

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APPLICABLE ONLY FOR CANDIDATES FROM DEVELOPING COUNTRIES (Important:

Please note that very few travel grants are available, and preference in

selecting participants will be given to eligible candidates who can guarantee travel

coverage by own local sources).

Please tick as appropriate:

- I can definitely find complete travel funds from local sources

\_\_\_

or

- I can definitely find half my travel funds from local sources

\_\_\_

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- I am requesting financial support from the ICTP for:

- Half travel \_\_\_ - Full travel \_\_\_ - Living allowance \_\_\_

I am NOT requesting financial support from the ICTP \_\_\_

I certify that if granted funds for my travel

I will attend the whole activity

.....

Signature

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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 Centre. I understand that any breach of this undertaking may result in the termination of the arrangements relating to my visit at the Centre.

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