The Abdus Salam
International Centre for Theoretical Physics

United Nations
Educational, Scientific and
Cultural Organization

IAEA
International Atomic Energy Agency

2245-27

Joint ICTP-IAEA Advanced School on the Role of Nuclear Technology in Hydrogen-Based Energy Systems

13 - 18 June 2011

Neutron access

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IFE Institute for Energy Technology

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Neutron sources

North America

Spallation Neutron Source, Oak Ridge

Los Alamos Neutron Science Center (LANSCE)

University of Missouri Research Reactor Center

High Flux Isotope Reactor, Oak Ridge

Canadian Neutron Beam Centre, Chalk River, Canada

Indiana University Cyclotron Facility

http://www.ncnr.nist.gov/nsources.html

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Neutron sources

Asia and Australia

ISSP Neutron Scattering Laboratory, Tokai, Japan

JAEA Research Reactors, Tokai,Japan

KENS Neutron Scattering Facility, Tsukuba, Japan

Hi-Flux Advanced Neutron Application Reactor, Korea

Bragg Institute, ANSTO, Australia

Neutron sources

Europe

ISIS-Rutherford-Appleton Laboratories, United Kingdom

Institut Laue-Langevin, Grenoble, France

Leon Brillouin Laboratory, Saclay, France

Berlin Neutron Scattering Center, Germany

GEMS at Helmholtz-Zentrum Geesthacht, Germany

Juelich Center for Neutron Science, Germany

FRM-II, Munich, Germany

Budapest Neutron Centre, Hungary

RID, Delft, The Netherlands

SINQ, Paul Scherrer Institut (PSI), Switzerland

Frank Laboratory of Neutron Physics, Dubna, Russia

St. Petersburg Neutron Physics Institute, Gatchina, Russia

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Nuclear techniques

You will use sophisticated, expensive and rare equipments

You have a privilege of using state of the art technique

It should be used in a responsible way for the advancement of knowledge

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Do you have something to measure with neutron?

- New sample
- New experiment
- New theory

Characterize your sample

- Do as many measurements and tests of your sample as necessary
- Know it as much as possible
- Do you still have questions?
- Could it be answered by neutron?

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Is it really new and worthwhile to do neutron?

Make a case that you need neutron (and only neutron) to answer a specific question.

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Contact a person that performed a similar neutron experiment.

Ask him if what you are planning make sense and is worthwhile.

Where is the best place I could do it?

Select the neutron source.

- Depends on the specifics of your experiment
- Availability
- Maybe your country has some privilege access to some equipment
- Deadlines (many facilities are operating in cycles)
- Plan well in advance

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Get in touch with the local contact

- Tell him what you think (you do not have to know exactly what you intend to do. The local conatct could help you on this.)

- See if it is possible on his apparatus

- Beam time availability (shut down, priorities, etc)

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Write the proposal

•Be honest and realistic (beam time, type of experiment, etc)

• Make the case that this is new and worthwhile from a scientific point of view.

Prepare the experiment

- Be sure you have the right sample and in enough quantity

- Prepare back-ups!

- Get a lot of sleep before because during the experiment you won't get much!

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