The Abdus Salam International Centre for Theoretical Physics

United Nations Educational, Scientific and Cultural Organization

IAEA International Atomic Energy Agency

1964 40th anniversary 2004

Workshop on Nuclear Reaction Data and Nuclear Reactors: Physics, Design and Safety

Organizer(s): A.L. Nichols, A. Trkov, J. Kupitz, A. Gandini and B. Stewart
Trieste - Italy, 16 February 2004 - 12 March 2004

Final programme

WEEK 1: 16 - 20 February (Room:Adriatico Guest House Kastler Lecture Hall)
Chairperson: A.L. NICHOLS (I.A.E.A., Vienna, Austria)

16 February 2004

08:30 - 10:00	(Room: Adriatico Guest House (Lower Level 1)) **REGISTRATION / ADMINISTRATIVE FORMALITIES**
10:00 - 10:20	(Room: Adriatico Guest House (Lower Level 1)) --- COFFEE BREAK ---
10:20 - 10:30	**A.L. NICHOLS** / *I.A.E.A., Vienna, Austria* **OPENING CEREMONY**
10:30 - 10:45	**J. GRASSBERGER** / *Scientific Computer Section, ICTP* **Introduction to ICTP Computer System**
10:45 - 12:00	**P. McLAUGHLIN** / *I.A.E.A., Vienna, Austria* **Introduction to Computer System**
12:00 - 14:00	(Room: Adriatico Guest House Cafeteria) --- LUNCH BREAK ---
14:00 - 15:30	**A.L. NICHOLS** / *I.A.E.A., Vienna, Austria* **Workshop overview**
15:30 - 16:00	(Room: Adriatico Guest House (Lower Level 1)) --- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
P. MCLAUGHLIN / *I.A.E.A., Vienna, Austria*
Computer exercises

17 February 2004

08:30 - 10:00 **B. CARLSON** / *Centro Tecnico Aerospacial, Sao Jose dos Campos, Brazil*
Overview of reaction theory

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **M. HERMAN** / *Brookhaven National Laboratory, Upton, New York, U.S.A.*
Introduction to EMPIRE

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 (Room: Adriatico Guest House Informatics Lab.)
M. HERMAN / *Brookhaven National Laboratory, Upton, New York, U.S.A.*
EMPIRE exercises

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
M. HERMAN / *Brookhaven National Laboratory, Upton, New York, U.S.A.*
EMPIRE exercises

18 February 2004

08:30 - 10:00 **B. CARLSON** / *Centro Tecnico Aerospacial, Sao Jose dos Campos, Brazil*
Optical model

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **R. CAPOTE** / *Center for Applied Studies for Nuclear Development, Havana, Cuba*
Coupled-Channels

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 (Room: Adriatico Guest House Informatics Lab.)
R. CAPOTE / *Center of Applied Studies for Nuclear Development, Havana, Cuba*
EMPIRE/ECIS exercises

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
R. CAPOTE / *Center of Applied Studies for Nuclear Development, Havana, Cuba*
EMPIRE/ECIS exercises

19 February 2004

08:30 - 10:00 **N. LARSON** / *Oak Ridge National Laboratory, U.S.A.*
Resonance theory

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **N. LARSON** / *Oak Ridge National Laboratory, U.S.A.*
Introduction to SAMMY

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 (Room: Adriatico Guest House Informatics Lab.)
N. LARSON / *Oak Ridge National Laboratory, U.S.A.*
SAMMY exercises

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
N. LARSON / *Oak Ridge National Laboratory, U.S.A.*
SAMMY exercises

20 February 2004

08:30 - 09:50 **N. LARSON** / *Oak Ridge National Laboratory, U.S.A.*
Further on SAMMY

09:50 - 10:00 **N. CAUCHY** / *TWAS, Trieste, Italy*
TWAS (Third World Academy of Sciences)

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **N. LARSON** / *Oak Ridge National Laboratory, U.S.A.*
Further on SAMMY

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 (Room: Adriatico Guest House Informatics Lab.)
N. LARSON / *Oak Ridge National Laboratory, U.S.A.*
SAMMY exercises

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
N. LARSON / *Oak Ridge National Laboratory, U.S.A.*
SAMMY exercises

WEEK 2: 23 - 27 February (Room:Adriatico Guest House Kastler Lecture Hall)
Chairperson: A. TRKOV (I.A.E.A., Vienna, Austria)

23 February 2004

08:30 - 10:00 **M. HERMAN** / *Brookhaven National Laboratory, Upton, New York, U.S.A.*
RIPL database + Statistical model of nuclear reactions

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **M. SIN** / *University of Bucharest, Romania*
Models for nuclear fission

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 (Room: Adriatico Guest House Informatics Lab.)
M. SIN / *University of Bucharest, Romania*
EMPIRE/fission exercises

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
M. SIN / *University of Bucharest, Romania*
EMPIRE/fission exercises

24 February 2004

08:30 - 10:00 **R. CAPOTE** / *Center of Applied Studies for Nuclear Development, Havana, Cuba*
Pre-equilibrium models of nuclear reactions

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **M. HERMAN** / *Brookhaven National Laboratory, Upton, New York, U.S.A.*
Level densities

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 (Room: Adriatico Guest House Informatics Lab.)
R. CAPOTE / *Center of Applied Studies for Nuclear Development, Havana, Cuba*
EMPIRE/pre-equilibrium exercises

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
R. CAPOTE / *Center of Applied Studies for Nuclear Development, Havana, Cuba*
EMPIRE/pre-equilibrium exercises

25 February 2004

08:30 - 10:00 **M. HERMAN** / *Brookhaven National Laboratory, Upton, New York, U.S.A.*
EMPIRE tips & tricks

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **M. SIN** / *University of Bucharest, Romania*
Nuclear data evaluation

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 **PRESENTATIONS BY PARTICIPANTS**

14:00 - 14:20 **I.O.B. EWA** / *Ahmadu Bello University, Zaria, Nigeria*
Reactor channel input-data for k0-standardization neutron activation analysis in low power research reactors

14:20 - 14:40 **A.M. SANCHEZ-BENITEZ** / *University of Huelva, Spain*
Experimental study of the elastic scattering of 6He+208Pb around the Coulomb barrier

14:40 - 15:00 **V. SEMKOVA** / *Institute for Nuclear Research and Nuclear Energy, Sofia, Bulgaria*
Measurements of neutron-induced reaction cross section on different isotopes of Co, Ni, Cu, Zr and Pb from the threshold up to 20 MeV

15:00 - 15:20 **F. CANTARGI** / *CNEA, Buenos Aires, Argentina*
Cold moderators: preliminary study on mesitylene

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 **PRESENTATIONS BY PARTICIPANTS**

16:00 - 16:20 **M.M.H. MIAH** / *University of Chittagong, Bangladesh*
The study of 105Pd(n, y)106Pd reaction with thermal neutrons

16:20 - 16:40 **A.K.M. HARUN-AR-RASHID** / *University of Chittagong, Bangladesh*
Neutron cross section of Er Isotopes

16:40 - 17:00 **P. ELE ABIAMA** / *Universite de Yaounde I, Cameroon*
Investigation of radiation levels at the Yaounde General Hospital, Cameroon

17:00 - 17:20 **Y. YEGOROV** / *National Ukrainian Academy of Sciences, Chernobyl, Ukraine*
New Safety Confiment

26 February 2004

08:30 - 10:00 **A. TRKOV** / *I.A.E.A., Vienna, Austria*
Introduction to nuclear data

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **O. SCHWERER** / *I.A.E.A., Vienna, Austria*
IAEA-NDS nuclear data services

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 (Room: Adriatico Guest House Informatics Lab.)
O. SCHWERER / *I.A.E.A., Vienna, Austria*
Exercises on data retrieval

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
O. SCHWERER / *I.A.E.A., Vienna, Austria*
Exercises on data retrieval

27 February 2004

08:30 - 10:00 **A. TRKOV** / *I.A.E.A., Vienna, Austria*
Evaluated nuclear data formats

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **A. TRKOV** / *I.A.E.A., Vienna, Austria*
Introduction to NJOY

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 (Room: Adriatico Guest House Informatics Lab.)
A. TRKOV / *I.A.E.A., Vienna, Austria*
NJOY exercises

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
A. TRKOV / *I.A.E.A., Vienna, Austria*
NJOY exercises

WEEK 3: 1 - 5 March (Room:Adriatico Guest House Kastler Lecture Hall)
Chairperson: J. KUPITZ / A. BADULESCU (I.A.E.A., Vienna, Austri

1 March 2004

08:30 - 10:00 **A. TRKOV** / *I.A.E.A., Vienna, Austria*
Data processing for applications

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **L. HUTTON** / *SERCO Assurance, Dorset, U.K.*
Introduction to WIMS

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 (Room: Adriatico Guest House Informatics Lab.)
A. TRKOV / *I.A.E.A., Vienna, Austria*
NJOY exercises

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
L. HUTTON / *SERCO Assurance, Dorset, U.K.*
WIMS Exercises

2 March 2004

08:30 - 10:00 **L. HUTTON** / *SERCO Assurance, Dorset, U.K.*
WIMS

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **L. HUTTON** / *SERCO Assurance, Dorset, U.K.*
Lattice transport theory of WIMS

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 (Room: Adriatico Guest House Informatics Lab.)
L. HUTTON / *SERCO Assurance, Dorset, U.K.*
WIMS exercises

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
L. HUTTON / *SERCO Assurance, Dorset, U.K.*
WIMS exercises

3 March 2004

08:30 - 10:00 **J. KUPITZ** / *I.A.E.A, Vienna, Austria*
Nuclear power: Current status and new developments

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **B. MISRA** / *I.A.E.A., Vienna, Austria*
Status and prospects for nuclear desalination

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 **A. STANCULESCU** / *I.A.E.A., Vienna, Austria*
Status of fast reactor and accelerator driven systems technology (Part I)

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 **A. STANCULESCU** / *I.A.E.A., Vienna, Austria*
Status of fast reactor and accelerator driven systems technology (Part II)

4 March 2004

08:30 - 10:00 **J. KUPITZ** / *I.A.E.A., Vienna, Austria*
International project on Innovative Nuclear Reactors and Fuel Cycles (INPRO)

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **J. KUPITZ** / *I.A.E.A., Vienna, Austria*
Status of high temperature gas cooled reactors and their applications

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 **A. BADULESCU** / *I.A.E.A., Vienna, Austria*
Heavy water reactor for simulators for education

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
A. BADULESCU / *I.A.E.A., Vienna, Austria*
Computer exercises

5 March 2004

08:30 - 10:00 (Room: Adriatico Guest House Informatics Lab.)
A. BADULESCU / *I.A.E.A., Vienna, Austria*
Computer Exercises

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **I. KODELI** / *Organization for Economic Cooperation and Development (OECD), Issy Les Moulineaux, France*
Services of the NEA Data Bank

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 (Room: Adriatico Guest House Informatics Lab.)
A. BADULESCU / *I.A.E.A., Vienna, Austria*
Computer exercises

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
A. BADULESCU / *I.A.E.A, Vienna, Austria*
Computer exercises

WEEK 4: 8 - 12 March (Room:Adriatico Guest House Kastler Lecture Hall)
Chairperson: A. GANDINI (E.N.E.A., Rome, Italy)

8 March 2004

08:30 - 10:00 **V. KAGRAMANIAN** / *I.A.E.A, Vienna, Austria*
Comparative assessment of different energy sources and their potential role in a sustainable energy mix

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **M. SZIKSZAINE-TABORI** / *I.A.E.A., Vienna, Austria*
Operational performance of nuclear power information system (PRIS)

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 **PARTICIPANTS / A. BADULESCU** / *I.A.E.A, Vienna, Austria*
Workshop papers presented by participants on advanced reactors

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 **PARTICIPANTS / A. BADULESCU** / *I.A.E.A., Vienna, Austria*
Workshop papers presented by participants on advanced reactors

9 March 2004

08:30 - 10:00 **M. CUMO** / *Universita' di Roma "La Sapienza", Italy*
Principles of nuclear safety (1)

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **M. CUMO** / *Universita' di Roma "La Sapienza", Italy*
Principles of nuclear safety (2)

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 **A. GANDINI** / *E.N.E.A., Rome, Italy*
Sensitivity theory methods for nuclear reactor analysis

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
N. BURGIO / *E.N.E.A., Rome, Italy*
Monte Carlo method: Theory and exercises (1)

10 March 2004

08:30 - 10:00 **R. JACQMIN** / *Commissariat a l'Energie Atomique, St. Paul les Durance, France*
Analysis and correlation of experimental data (1)

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **A. GANDINI** / *E.N.E.A., Rome, Italy*
Innovative reactors: Role and physical aspects

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 **G. BRUNA** / *Framatome, Paris, France*
Reactivity & power: Principles of control of PWR - NNPs

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
N. BURGIO / *E.N.E.A., Rome, Italy*
Monte Carlo method: Theory & exercises (2)

11 March 2004

08:30 - 10:00 **R. JACQMIN** / *Commissariat a l'Energie Atomique, St. Paul lez Durance, France*
Analysis and correlation of experimental data (2)

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **G. BRUNA** / *Framatome, Paris, France*
Aspects of Plutonium recycling in French PWRs

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 **G. BRUNA** / *Framatome, Paris, France*
Reactivity & power: Principles of control of PWR - NNPs (calculation aspects)

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
N. BURGIO / *E.N.E.A., Rome, Italy*
Monte Carlo method: Theory and exercises (3)

12 March 2004

08:30 - 10:00 **P. RAVETTO** / *Politecnico di Torino, Italy*
Reactor dynamics (1)

10:00 - 10:30 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

10:30 - 12:00 **G. BRUNA** / *Framatome, Paris, France*
Monte Carlo calculation in reactor design

12:00 - 14:00 (Room: Adriatico Guest House Cafeteria)
--- LUNCH BREAK ---

14:00 - 15:30 **P. RAVETTO** / *Politecnico di Torino, Italy*
Reactor dynamics (2)

15:30 - 16:00 (Room: Adriatico Guest House (Lower Level 1))
--- COFFEE BREAK ---

16:00 - 17:30 (Room: Adriatico Guest House Informatics Lab.)
N. BURGIO / *E.N.E.A., Rome, Italy*
Monte Carlo method: Theory and exercises (4)