CHERNE
A network to promote the interest of younger generations in radiation protection in radiological and nuclear engineering

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on behalf of the CHERNE Network
CONTENTS

- Motivations
- CHERNE network organisation
- Members
- Activities
- Supports and Sponsors
PROBLEMS

- The educational capacity of many European Institutions of Higher Education in Radiological and Nuclear Engineering has decreased in the last decades
- Less interest
  - among students and
  - among academic and political authorities
- Financial restrictions
  - difficult to maintain and develop facilities, equipment and academic staff needed for practical training of students
- Each university and country presents a different situation
- Many departments had to reduce their offer and to concentrate it on a few specialities
POSSIBLE SOLUTION

An increased cooperation at the international level on the educational efforts in Radiological and Nuclear Science and Engineering

Several networks have been developed

- focused on specific domains
- concentrated on high level professional training
- strongly structured or not
**CHERNE network**

- First steps in 2002, formal creation in 2005
- Mostly EU institutions (16), open to other (2)
- Mainly focussed on **teaching and learning activities**
- A wide-scope open academic network
- To **enhance cooperation**, competence and equipment sharing between partners
- A **declaration**, signed by all partners, contains details concerning organisation, membership and activities

www.upv.es/cherne/
Cooperation for Higher Education on Radiological and Nuclear Engineering

..... Name of a fish in Portugal and Canary Islands
CHERNE organisation

- A minimal administrative organisation
- Secretary elected at the annual meeting
- Web page through which the activities of the network are communicated: www.upv.es/cherne/
- Annual Meeting to evaluate the activities of the network and discuss new proposals
- Annual Workshop open to non-members
- For the moment no fee is asked for CHERNE membership.
CHERNE workshop 2006, Valencia
**CHERNE membership**

- Academic institutions, research institutions, companies or individuals are accepted as members on presentation by two members, including at least one European academic member.

- Documents for this presentation as well as a detailed list of partners can be found at the official Web site [www.upv.es/cherne/](http://www.upv.es/cherne/).
MEMBERS

- Belgium: U. Hasselt, HE Spaak Brussels
- Czech Republic: CVUT Prague
- Germany: FH Aachen
- Greece: NTUA Athens, Aristotle U. Thessaloniki
- Portugal: U. Coimbra, UT Lisboa
- Spain: UPV Valencia, U. Salamanca, UPC Barcelona
- Other: Kansas SU, Cadi Ayyad U. Marrakech
The scope of CHERNE is not limited and any activity related to Higher Education in Radiological and/or Nuclear Engineering can be proposed.

A priority is given to teaching activities for the students of the member institutions (mostly at the Master level).

Other types of cooperation may be also developed.
CHERNE intensive courses

- Strong attention to practical training, including when possible an access to large facilities
- Low fee, cheap accommodation
- The language used in CHERNE activities is English

SPARROW, training reactor of CVUT, Prague
ERASMUS INTENSIVE PROGRAMMES 1

PAN - Practical Approach to Nuclear techniques
2 week Erasmus IP, 2002-2005

SPERANSA - Stimulation of Practical Expertise in Radiation and Nuclear Safety
2 week Erasmus IP, 2006-2008

ICARO - Intensive Course on Accelerator and Reactor Operation and Applications
2 week Erasmus IP, 2009-2011
ERASMUS INTENSIVE PROGRAMMES 2

JUNCSS - Jülich Nuclear Chemistry Summer School  
2-week Erasmus IP, 2007-2011

SARA - Safe Application of Radiation and Radionuclides  
2 week Erasmus IP, 2012-2014

SEE POSTER SESSION

Submitted for 2014

MANTRA - Medical applications of nuclear techniques and radiation

Exercise at SCK-CEN

BVS-ABR 2013 - BRUSSELS
OTHER INTENSIVE COURSES

Radiation protection and nuclear measurements in non conventional sectors
ISIB Brussels / XIOS Diepenbeek (Belgium), 2007-2008

Measurement of Environmental Radioactivity
XIOS / ISIB, 2009-2013

Probabilistic Risk Assessment
UPV, Valencia (Spain), 2011

Monte Carlo methods in radiological and nuclear engineering
ISIB, Brussels, 2010

Natural dose rate measurement
Student exchanges

- Mainly: one Erasmus semester for the Master thesis
- Possibility to follow courses abroad
- CHERNE helps to establish contacts for ERASMUS PLACEMENT: internship in a foreign company or laboratory
- PhD organised abroad or co-organised
Simulation of detector calibration using MCNP
X-Ray photon spectroscopy calculations
Introduction to plasma physics
Protection against Natural Radiation
Gamma spectrometry: simulation, deconvolution, applications
Methods and applications in radiochemistry
Advanced signal analysis in nuclear medicine
Radiation detection
Dark matter
NORM
Monte Carlo techniques
Introduction to the methods of soft computing in engineering
Introduction to particle accelerators and linear beam dynamics
Neutron detection and measurement

..................and more
Visits

- Visit to Chernobyl, June 2011
- Visit to Zwentendorf BWR in Austria, 2012
- During Erasmus IP’s:
  - Temelin PWR (CZR)
  - INP Rez (CZR)
  - LNS Catania
  - ITN Lisboa
  - Belgoprocess
  - SCK-CEN Mol: Hades – LHMA
  - FZ Jülich
- During CHERNE workshops
  - Cofrentes BWR
  - SCK-CEN Mol: Guinevere
  - NRC Demokritos Athens
Supports and sponsors

- Support of research centres in the organisation of the intensive programmes
  - SCK-CEN Mol, JRC-IRMM Geel, FANC, INP-CAS Prague, NRPI Prague, INFN-LNS Catania, ITN Lisboa, several medical centres

- Sponsorship for workshops or intensive courses
  - In particular: BVS-ABR, Suez, IRE, SCK-CEN, Prince Philippe foundation, Canberra, ECS, Belgoprocess
  - But also: Ministerio de Educación y Ciencia, Bancaja, Iberdrola, Generalitat Valenciana, Banca di San Cataldo, Radius, Greek Atomic Energy Commission, ...

- Warm thanks to all of them

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A CHERNE student story

Giorgia Cinelli
student in Bologna
Master thesis in ISIB-Brussels (Erasmus)
took part to two CHERNE intensive courses
« da studente ho potuto apprezzare i corsi organizzati dal CHERNE e per me sono state bellissime esperienze sia da un punto di vista didattico che umano, e vi ringrazio molto molto per questo »
Involved in a CHERNE research collaboration with ISIB on radon risk mapping
Participant to two CHERNE workshops
Radiation protection expert level II in Italy
Now working in radiation protection at Protex, Italy
Thank you for your attention