

CHERNEws

Internal information bulletin of the CHERNE network

#5 - December 4, 2015
Editors: I. Gerardy, F. Tondeur

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1. CHERNE activities of the next semester (Jan.-May 2016)

Details about the organization of these courses are given in annexes 1 to 3. Please disseminate this information among your students.

Monte Carlo Method and MCNP

This 3-day intensive course will be organized twice, first in Jülich (Germany) 5-7 January 2016, repeated in Brussels (Belgium) 15-17 February 2016, for students at master level or last year of bachelor level.

Deadline for registration :

Jülich session: 18 December 2015

Brussels session: 1 February 2016

XIMER – Measurement of Environmental Radioactivity

2-week intensive course organized in Diepenbeek and Brussels (Belgium) for students at master level or last year of bachelor level, 11-22 April 2016.

Deadline for registration: 18 January 2016

WATER ISSUES AT NP PLANTS

This intensive course will be organized at BSU Minsk (Belarus), March, 15-26, 2016.

Deadline for registration: 25 January 2016.

2. Organization of the ERASMUS strategic partnership in Radiation Protection

The kick off meeting of the ERASMUS strategic partnership in Radiation Protection was held in Brussels the 23th of November 2015.

List of participants:

Name	Institution
Ales Fronka	National Radiation Protection Institute-SURO
Friedrich Hoyler	Fachhochschule Aachen
Hélène Stiévenart	Haute Ecole Paul-Henri Spaak (HESpaak)
Isabel Lopes	University of Coimbra
Isabelle Gerardy	Haute Ecole Paul-Henri Spaak (HESpaak)
Caroline Licour	Haute Ecole Paul-Henri Spaak (HESpaak)
José Ródenas	Polytechnic University, Valencia (UPV)
Konstantinos Karfopoulos	Greek Atomic Energy Council (EEAE)
Lenka Thinova	Czech Technical University (CTU)
Marios Anagnostakis	National Technical University, Athens (NTUA)
Sonja Schreurs	University of Hasselt
Els Wieers	University of Hasselt

Aim of the meeting

The goal of the kick off meeting was mainly:

- To confirm the role of “Work package leader” for the different tasks defined in the strategic partnership program,
- to establish a work group for each teaching and training activity and to identify its coordinator,
- to obtain a first tentative schedule and identify activities to be organized during the academic year 2015-2016

Work package and leader

Different task were identified and for each of them, an institution was defined as leader:

O1: Analyze of the present situation in radiation protection and radioecology within the European countries

UHasselt is leading this task. They will first make an evaluation of already existing surveys. Afterward, a survey specifically focused on the course modules we want to develop will be created and sent to all partners who will distribute it within their list of contacts. UHasselt will perform an analysis of the result and create a report not later than May 2016.

O2: Implementation of course modules on an e-learning platform

EEAE is leading the development of the platform on MOODLE and NTUA will coordinate the continuity of the contents between the 6 different modules. The table below gives the repartition of the different tasks (coordinator, partner) for each module. The module 1, 2 and 5 need to be ready for a first use in May 2016 and will be used as pre-requisite for the training module organised during this academic year.

	Title	ECTS	Leader	Co-workers	Ready by
1	Basic nuclear and radiation physics	2	CTU	SURO UCoimbra	May 2016
2	Basics of measurements and dosimetry	2	Aachen	NTUA CTU	May 2016
3	Radiation protection	2	SURO	UPV EEAE	Oct. 2016
4	General safety principles	2	UPV	HESpaak	Oct.2016
5	Basic radio-chemistry	2	HESpaak	FHAachen UHasselt	May 2016
6	Medical applications	2	UCoimbra	NTUA EEAE (UniBo, FHAachen)	Oct. 2016

O3: Training in Radiation Protection and Radioecology

CTU is leading this work package and will have the duty of coordinating the dates of each module but also to ensure the transmission of all the documents needed for administrative purpose. The table below summarizes the different training modules and the proposed period for some activities.

	Title	ECTS	Organizer	Place	Date	Contributors
1	Probability risk assessment	2	UPV	Valencia	Jan. 2017	HESpaak
2	Environmental measurements	2				HESpaak,SURO Hasselt,NTUA
3	Safe industrial applications of radiation and radionuclides	2	CTU	Prague	May 2016	SURO,Coimbra Aachen,NTUA
4	Radio-chemistry	2	Aachen HESpaak	Jülich	May 2016	EEAE, UPV
5	Radioactive waste management	2	Hasselt Aachen	Hasselt Jülich		HESpaak
6	Practical radiation protection in medical field	2	UniBo	Bologna		Coimbra CTU, EEAE

Modules 3 and 5 should be organised during this academic year.

Other work packages:

1. Administration: HESpaak

As coordinator of the project, the tasks of HESpaak are listed below:

- Project monitoring
- Budget control
- Sending in due time correct data, information and documentation to the Agency
- Informing the Agency if significant changes arise in the program
- Reporting in Mobility Tool+
- Submitting the reports; the first in May 2016 and the second at the end of the project
- Paying the partners in due time

2. Quality: UNIBO

The assessment of the effectiveness of the program will be based on 3 achievement indicators:

- The number of participants along with the gross average mark will be communicated after each teaching activity
- the level of proficiency gained by the participant students/trainees in the studied subject
- the increased marketability of their skills that can be assessed with the help of the non-educational partners

A survey can be organized by the UNIBO to analyze if the teaching and training program ensures the completion of skills needed in the industry. Companies will be chosen at random in all the fields covered by the teaching and training program to evaluate the matching between the needs and the present offer.

Each module (e-learning and training) can also be evaluated by the students and by the professors by means of a questionnaire. The answers will be analyzed at the end of the 1st year by Unibo. According to the results modifications of the contents could be implemented in the 2nd year of the project.

3. Dissemination: NTUA

A first tool to disseminate the information can be the CHERNE platform. In the first year, we have to ensure that the students of partner institutions are aware of the possibility offered to them. In a second phase we have also to ensure that we are properly responding the job market and participants needs. It is important to give visibility to the results obtained and the project added value and to ensure the project sustainability.

Different actions can be undertaken:

- Visibility at student fairs, "open campus days", "international days" or/and "international staff training weeks" of each institution.
- Participating in meetings, congresses and workshops devoted to education or related to radiation protection or radioecology at European level.
- Encourage each partner to disseminate the information to their contacts in industries, research institutions and public bodies (i.e. representatives of the labor market).

- ***Use social networking: Facebook to communicate to students, alumni and LinkedIn/ Tweeter to professionals (through discussion groups for instance)***

3. *Recent CHERNE intensive courses*

XIMER 2015

XIMER is a 2-week intensive course organized in Belgium by the University of Hasselt and ISIB, Haute Ecole Spaak, Brussels. This course is focusing on the measurement of radioactivity in the environment.

In 2015, it was held from the 16th to the 27th of March. The first week was organized in Hasselt and the second one in Brussels. 13 students in nuclear engineering participated in this program, seven from the third year of bachelor in UHasselt, six from the first year of master in ISIB, including an Erasmus student of the University of Bologna. This course was also open to students from other CHERNE partners.

The program included lectures, practical sessions, field trips, laboratory work and an evaluation part.

During the first week, the students, hosted by the University of Hasselt, had lectures about NORM's in building materials and their measurement. They received information about various types of detectors to be used on the field and trained with them. The first field trip was organized in Demerbroeken where an historical radioactive contamination by the phosphate industry can be highlighted. Gamma spectrometry was performed in situ and assessed the contamination of the area. Some soil samples were collected to be measured in the laboratory. The second field trip was held in Visé, near Liège. The soil over there is qualified as "Devonian-Carboniferous" and previous analyzes showed relatively high concentration of Uranium and Radium-226. Hotspots were highlighted. Finally, some measurements of dose rate were performed on different types of building rocks in the city of Hasselt. Granite showed the highest values.

The second week in Brussels began at ISIB with lectures about sampling and measurement of radioactivity in collected samples, and about the Radon in our living environment. A field trip was organized in Saint-Hubert, in the south of Belgium, an area known to be affected by indoor Radon pollution and also by the fallout of the Chernobyl accident. Soil samples were collected, to be analyzed in the laboratory. The students also the measured the permeability of the soil and they collected samples of soil gas. The activity of Rn

4. *CHERNE*s is your bulletin



Field trip Demerbroeken

in those samples was measured in the laboratory.

Back at ISIB, we measured the samples from Demerbroeken and Saint-Hubert. We quantified the different radionuclides detected in them.

The activity in radon in the air of dwellings was measured with charcoal canisters during this second week.

The students spent two intensive weeks in Hasselt and Brussels. They had the opportunity to discover a new application of the nuclear measurements: the environment. Taking care of our environment is not incompatible with the interest in nuclear sciences!

As reported by the students themselves, the cooperation between the students of UHasselt and ISIB was great, there was a nice atmosphere with also group activities after work.

To be continued in 2016!

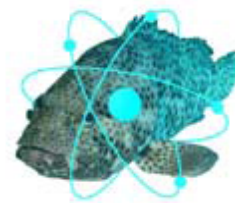
All CHERNE members are invited to send short communications, related to the CHERNE objectives, which they believe interesting for the other members. CHERNE objectives are described in the CHERNE declaration on www.upv.es/cherne .

Here you can announce conferences, job offers, call for partners for your projects ...

Send your text to both editors gerardy@isib.be, tondeur@isib.be .



CHERNE 2015-16

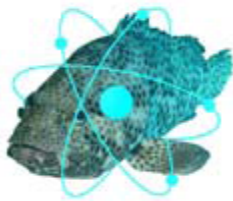


Project Plan for CHERNE activities and other actions proposed to the network

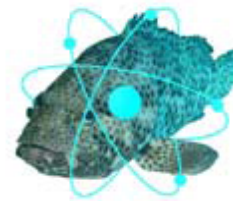
Monte Carlo Method and MCNP

Title of the project and acronym (if applicable)	Monte Carlo Method and MCNP
Type of the project	Shared course
Main objective of the project	Introduction to Monte Carlo codes: <ul style="list-style-type: none"> - Mathematical aspects (5h) - Presentation of the MCNP4C2 codes
Short description of the project	The course will provides a mathematical introduction to MC methods and a first introduction to one existing code: MCNP4C2. After some explanation about the input file and output results, a personal exercise about a (nearly) real situation will be proposed to the students
Expected learning outcomes (if applicable)	To be able to realize a simple MCNP input and to analyze an output file
Date of the project	5 th to 7 th of January 2016 15 th to 17 th February 2016
Place(s) of the project	FH Aachen (Julich) for the first period an ISIB (Brussels) for the second period
Coordinator(s)	F.Hoyler, FH Aachen <hoyler@fh-aachen.de> I.Gerardy, ISIB gerardy@isib.be
Other partners	U Hasselt
Is the partnership still open to more partners?	open
Intended participants Expected present studying level of participants and their specialisation (if relevant)	students of 3Ba, Ma the activity is organized for the own students, and is open for students of CHERNE partners
Prerequisites Expected initial knowledge	Statistics, basics on particle transport
Intended or maximal number of participants	

Working method, time schedule and deadlines for the organisation and for the task force	<p>3 days: Day 1, AM: Mathematical aspects PM: introduction to MCNP code Day 2, AM: Mathematical aspects PM: introduction to MCNP code Day 3: personal exercise</p> <p>Deadline for registration: Jülich session: 18 December 2015 , send e-mail to hoyler@fh-aachen.de Brussels session: 1 February 2016, send e-mail to gerardy@isib.be</p>
Evaluation (of participants, by participants, by organisers, ...)	Evaluation of participants by organisers
Is the project part of an Erasmus program?	no
ECTS or ECVET credits applicable? How many?	1 ECTS
Are any other industrial or research non CHERNE partners involved?	no
Terminology	CHERNE: Cooperation for Higher Education on Radiological and Nuclear Engineering
Practical organisation	Accommodation : not organized
Costs for the students (if applicable)	Travel : not covered Accommodation: not covered Tuition fee: no



CHERNE 2015-16



XIMER - Measurement of Environmental Radioactivity

Title of the project and acronym (if applicable)	XI-MER Measurements of Environmental Radioactivity
Type of the project	Intensive course
Main objective of the project	The goal of the XI-MER course is to involve the students in radioactivity measurements in the environment. Both artificial and natural contamination will be examined. While the activity itself will focus on the measurement techniques, the output will also be a better understanding of our radioactive environment and a better evaluation on what can be harmful and what has to be accepted.
Short description of the project	ISIB (Brussels) and UHasselt-NuTeC (Diepenbeek) organize a 10-day course to confront the participants with possible problems regarding radioactivity in our environment. The course will mix, approximately in 40/60 proportion, lectures and practical exercises (laboratory work and in situ measurements). It will include an evaluation part. Different field trips are foreseen. The course will include an evaluation part.
Date of the project	April 11 th to April 22 th 2016
Place(s) of the project	Diepenbeek (UHasselt-NuTeC) and Brussels (ISIB), Belgium
Coordinator(s)	Caroline Licour, ISIB, licour@isib.be Luc Lievens, UHasselt, luc.lievens@uhasselt.be
Contact person (if different)	Caroline Licour, ISIB, licour@isib.be
Other partners	UHasselt
Is the partnership still open to more partners?	closed
Intended participants Expected present studying level of participants and their specialisation (if relevant)	The course is intended for ISIB and UHasselt students studying in the field of nuclear technology. Individual students from CHERNE institutions are welcome.
Prerequisites Expected initial knowledge	Elementary knowledge about nuclear and radiation physics and radiation measurements is expected. Students in the last year of the Bachelor level, or at the Master level, are the target audience, but other students may be accepted.
Intended or maximal number of participants	The total number of participants is limited to 14 due to constraints in the organization of practical exercises.

Working method, time schedule and deadlines for the organisation and for the task force	The students from the institutions of the CHERNE network should apply to Caroline Licour (licour@isib.be) before January 18, 2016 . If less than 14 students have applied at that date, the recruitment will be open to other institutions.
Evaluation (of participants, by participants, by organisers, ...)	The basis of the evaluation of the participants will be: <ul style="list-style-type: none"> - laboratory reports - short oral presentation of a defined aspect of the measurement campaign.
Is the project part of an Erasmus program?	No
ECTS or ECVET credits applicable? How many?	4 ECTS credits.
Are any other industrial or research non CHERNE partners involved?	No
Terminology	CHERNE: Cooperation for Higher Education on Radiological and Nuclear Engineering
Practical organisation	Accommodation of non-local students is organized in Hasselt during the first week and in Brussels during the second week and the intermediate week-end.
Costs for the students (if applicable)	The fee is fixed at 200€ and covers the tuition fee as well as: <ul style="list-style-type: none"> -The accommodation for the non-local students -The farewell drink, and other social activities. -The travel from Hasselt to Brussels between week 1 and week 2. <p>Travel: Foreign students are expected to organize their travel to Brussels airport and to Hasselt/Diepenbeek (first week) themselves at their own cost, as well as their return trip from Brussels at the end of the course.</p>

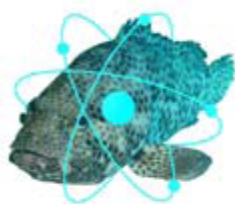
Annex 2.2 : Preliminary program

First week in UHasselt Diepenbeek

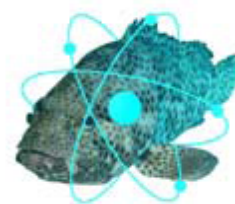
Monday 11/04	Tuesday 12/04	Wednesday 13/04	Thursday 14/04	Friday 15/04
<p>10h30</p> <p>Introduction to program</p> <p>Lecture</p> <ul style="list-style-type: none"> ▪ NORM projects ▪ Introduction field trips ▪ Canisters <p>Explaining E-learning tool</p>	<p>9h00</p> <p>Lecture: measurements of NORM and building materials</p> <ul style="list-style-type: none"> ▪ Introduction Fieldspec en CANBERRA apparatus for field trip ▪ NORM lab samples 	<p>8h30</p> <p>Field trip Demerbroeken in partnership with SCK.CEN</p> <p>By bus to Demerbroeken</p>	<p>8h30</p> <p>Group work</p> <p>Preparing framework and assigning tasks to prepare the written report</p> <p>Evaluation of E-learning tool : Description of the actions taken during the XIMER activities, including recommendations for future improvements</p>	<p>Students by train to Brussels</p> <p>soil sampling equipment and canisters in Brussels</p>
<p>12h00 Lunch UHasselt</p>	<p>12h30 Lunch UHasselt</p>	<p>Lunch at field trip</p>	<p>10h30</p> <p>Field trip Antwerpen MegaPorts</p>	<p>Lunch Brussels (at FANC?)</p>
<ul style="list-style-type: none"> ▪ 13h00 Soil sampling introduction lecture <p>practical exercises</p> <ul style="list-style-type: none"> ▪ 14h00 per group : Introduction soil sampling equipment ▪ 14h00 other groups : E-learning tool 	<p>13h30</p> <ul style="list-style-type: none"> ▪ preparation field trip (set up of equipment) ▪ equipment ready for transport <p>15h00 E-learning tool</p>	<p>16h00 By bus to Diepenbeek</p> <p>17h00 Cleaning tools!</p>		<p>Federal Agency of Nuclear Control</p> <ul style="list-style-type: none"> ▪ presentation FANC ▪ reception FANC

Second week in ISIB Brussels

Day	Sun	Mon	Tue	Wed	Thu	Fri
Morning	Free in Brussels	Lecture: Environmental radioactivity, sampling and measurement methods	Field trip in Ardenne	Laboratory work	Laboratory work Discussion of results	Preparation of reports and of oral presentations
		Lunch in ISIB	Picnic in the field	Social activity	Lunch in ISIB	Lunch in ISIB
Afternoon	Free in Brussels	Lecture: radon, sampling and measurement methods	Field trip in Ardenne	Laboratory work	Discussion of results Preparation of reports	Oral Presentations Farewell drink
Evening						



CHERNE 2015-16



Spring school “WATER ISSUES AT NPP”

Title of the project and acronym (if applicable)	WATER ISSUES AT NPP
Type of the project	Intensive course (spring school)
Main objective of the project	This course plans to give an overview of issues of the water chemistry support at operating NPP. The aim of this course is to introduce participants on water related safety issues at NPP. It attempts to provide basic knowledge on water pollution and treatment to students and give them hand experience of water treatment.
Short description of the project	The course combines lectures, labs, extracurricular activity CONTENTS 1. Water at NPP 2. Methods of waste water treatment 3. Measurement techniques and analysis of Chernobyl samples 4. Corrosion issues of NPP 5. Intercultural communication skills
Expected learning outcomes (if applicable)	Different aspects of water chemistry are considered (e.g. technologies of waste water treatment, measurement techniques of model and real water samples, corrosion at NPP). 36 hours of laboratory are scheduled within the course. The participants realize measurements of real samples contaminated as a result of Chernobyl catastrophe, modeling of waste water treatment.
Date of the project	15-26 March 2016
Place(s) of the project	Belarusian State University (Belarus)
Coordinator(s)	PhD Tatsiana Savitskaya, BSU, savitskayata@bsu.by PhD Iryna Kimlenka, BSU, kimlenka@bsu.by
Other partners	Prof. Dr. Dzmitry Hrynshpan, Research Institute for Physical and Chemical Problems, Belarus
Is the partnership still open to more partners?	closed
Intended participants Expected present studying level of participants and their specialisation (if relevant)	The activity is organized for the own students and all CHERNE partners
Prerequisites Expected initial knowledge	The participants must have a basic knowledge in chemistry
Intended or maximal number	12 (two teams)

of participants	
Task force (if applicable)	Research Institute for Physical and Chemical Problems, Belarus
Working method, time schedule and deadlines for the organisation and for the task force	26-30 hours /1 week, See Annex 3.1 Deadline for registration: 25 January 2016 Communication of admittance: 8 February 2016 The educational strategy of this course is active learning based on the principles of cooperative learning and peer-lead team learning (one or two Belarusian student as a tutor of international students in each team).
Evaluation (of participants, by participants, by organisers, ...)	Assessment of the student is on the basis of oral presentation of individual work
Is the project part of an Erasmus program?	No
ECTS or ECVET credits applicable? How many?	4 ECTS credits
Are any other industrial or research non CHERNE partners involved?	No
Terminology	CHERNE: Cooperation for Higher Education on Radiological and Nuclear Engineering BSU: Belarusian State University
Practical organisation	Accommodation is planning at the BSU campus
Costs for the students (if applicable)	Travel : not covered Accommodation: not covered Social events Tuition fee TOTAL FEE: 45€/credit

Annex 3.2:**Intensive Program (Spring School) “Water issues at NPP” (12 days)**

1 Week		
1 Day (Tuesday)	Welcome	30 min
	Lecture “Water at NPP”	2h
	Lab “Simulation of typical situations of primary water chemistry regime at NPP and its control using ion chromatography”	6 h (team 1)
	Lab “Investigation of different water treatment systems efficiency”	6h (team 2)
2 Day (Wednesday)	Lecture “Water at NPP”	2h
	Lab “Simulation of typical situations of primary water chemistry regime at NPP and Its control using ion chromatography”	6 h (team 2)
	Lab “Investigation of different water treatment systems efficiency”	6h (team 1)
3 Day (Thursday)	Lecture “Liquid radioactive wastes and their treatment”	2 h
	Lab “Modeling of waste water treatment by liquid emulsion membranes”	6 h (team 1)
	Lab “NPP laundry waste water treatment for removal of surface active substances and $^{60}\text{Co}^{2+}$ ”	6h (team 2)
4 Day (Friday)	Lab “Modeling of waste water treatment by liquid emulsion membranes”	6 h (team 2)
	Lab “NPP laundry waste water treatment for removal of surface active substances and $^{60}\text{Co}^{2+}$ ”	6h (team 1)
	Extracurricular Activity. Preparation of posters and presentations	
5 Day (Saturday)	Excursion Day	
6 Day (Sunday)	Free Day	
2 Week		
7 Day (Monday)	Lecture “ Corrosion issues of NPP construction materials and radioactive waste storage”	2 h
	Lectures of the representatives of the Belarusian Research Institutes	4 h
8 Day (Tuesday)	Lecture “Communication skills for team working”	2 h
	Lab “Analysis and treatment of real water and soil samples contaminated by Chernobyl fallout”	6 h (team 1)
	Lab “Corrosion process and its modeling”	6h (team 2)
9 Day (Wednesday)	Lab “Analysis and treatment of real water and soil samples contaminated by Chernobyl fallout”	6 h (team 2)
	Lab “Corrosion process and its modeling”	6h (team 1)
	Extracurricular Activity. Preparation of posters and presentations	
10 Day (Thursday)	Round table. Presentations of posters, discussion	4 h
	Conclusions of the program. Closing ceremony.	2 h
11 Day (Friday)	Excursion Day	
12 Day (Saturday)	Departures	