



**The 6<sup>th</sup> ENEN PhD Event 2012**  
**21<sup>st</sup> International Conference Nuclear Energy for New Europe**  
**in Ljubljana, Slovenia, 5-7 September 2012**

*Summary report*

## 1 ENEN PhD Event

The ENEN PhD Event has been organized since 2007 with the objectives:

- to provide a forum for PhD students to present their research work to their fellows and colleagues in a friendly but competitive spirit
- to promote the research work of PhD students in the nuclear fields, in particular experimental work
- to set up a bridge between PhD students and professionals in the nuclear field

The past ENEN PhD Events were held as follows:

- 1<sup>st</sup> ENEN PhD Event at the International Youth Conference on Energetics (IYCE 2007) in Budapest, Hungary, 1 June 2007 with the selected 12 PhD students
- 2<sup>nd</sup> Event at the International Youth Nuclear Congress (IYNC 2008) in Interlaken, Switzerland, 23 September 2008 with the selected 14 students from 11 EU countries
- 3<sup>rd</sup> Event at the International Youth Conference on Energetics 2009 (IYCE 2009) at the Budapest University of Technology and Economics in Budapest, Hungary, on 5 June 2009 with selected 12 PhD students from 6 EU countries (Belgium, France, Italy, Switzerland, Slovakia and Slovenia) and South Africa
- 4<sup>th</sup> ENEN PhD Event 2010 at the European Nuclear Conference 2010 in Barcelona, Spain, on 2 June 2010 with selected 8 PhD students from 6 EU countries and Russian Federation
- 5<sup>th</sup> ENEN PhD Event 2011 at the International Congress on Advances in Nuclear Power Plants (ICAPP) in Nice, France, 4 May 2011 with selected 9 PhD students from 7 EU countries

The 6<sup>th</sup> ENEN PhD Event 2012 was organized in the framework of the 21<sup>st</sup> International Conference Nuclear Energy for New Europe (NENE) in Ljubljana, Slovenia, 5-7 September 2012<sup>1</sup>. 11 PhD students were selected by the ENEN PhD Event 2012 Jury from 7 EU countries and Ukraine and a PhD student was invited from Russian Federation in the framework of FP7 ENEN-RU project<sup>2</sup>.

The announcement, the criteria for ENEN Prize and the application form for the Event are given at Annex I, II and III respectively.

The members of the Jury of the Event 2012 are:

- Leon Cizelj (Jozef Stefan Institute, Slovenia), CHAIR

<sup>1</sup> <http://www.nss.si/ljubljana2012/>

<sup>2</sup> <http://www.enen-assoc.org/en/activities/for-universities/coopbeyondeu/enenru.html>

- Bernard Bonin (European Nuclear Society High Scientific Council)
- Joseph Safieh (CEA/INSTN, France)
- Emilio Minguez (Universidad Politecnica de Madrid, Spain)
- Michel Giot (SCKCEN, Belgium)
- Petre Ghitescu (University Politechnica Bucharest, Romania)
- Rakesh Chawla (Swiss Federal Institute of Technology Lausanne, Switzerland)
- Bruno Panella (Consortium Interuniversitario, Italy)

Following the opening remark by the Chair of the Jury, 12 PhD students presented their research work for 25 minutes followed by 5 minutes questions and discussion (30min in total for each). The selected 11 presentations were judged by the Jury members by the criteria given at Annex II.

A group picture was taken before lunch break.

The Jury meeting was held after the Event to select three ENEN Prizes. The Award Ceremony took place during the conference dinner on the same day. Two tables were arranged for the students and Jury members.

## 2 Program of the Event

### 8h30h-8h40 OPENING

Prof. Leon CIZELJ (*Jozef Stefan Institute, Slovenia*), *Chair of the Jury*

30 min for each = 25 min presentation + 5 min Q&A

### 8h40-10h15 SESSION 1 REACTOR PHYSICS

Chair: Prof. Petre GHITESCU (*University Politechnica Bucharest, Romania*)

- 8h40 Fabio ALCARO (*Politecnico di Torino, Italy*): Quasi-static method in neutron transport
- 9h10 Gašper ŽEROVNIK (*Jožef Stefan Institute, Slovenia*): Use of covariance matrices for estimating uncertainties in reactor calculations
- 9h40 Kaichao SUN (*Paul Scherrer Institut / Swiss Federal Institute of Technology Lausanne, Switzerland*): An Optimization Study for Improving the Safety Characteristics of a 3600MWth Sodium-cooled Fast Reactor via Coupled Neutronics/Thermal-Hydraulics Analysis
- 10h10 Closing the session

10h15-10h30 *Coffee break*

### 10h30-12h10 SESSION 2 SAFETY

Chair: Prof. em. Michel GIOT (*SCK•CEN, Belgium*)

- 10h30 Duško KANČEV (*Jožef Stefan Institute, Slovenia*): Multi-Objective Optimization of Testing and Maintenance in Nuclear Power Plants Considering Component Ageing

- 11h Gonzalo JIMENEZ VARAS (*Universidad Politécnica de Madrid, Spain*):  
Integrated Safety Assessment of the Steam Generator Tube Rupture Accident in a  
PWR using best estimate codes
- 11h30 Arthur HELLOUIN DE MENIBUS (*CEA, France*): Hydride blisters formation,  
characterization and effect on the fracture of Zircaloy-4 cladding tubes under  
reactivity initiated accident conditions
- 12h Closing the session

12h10 **GROUP PICTURE**

12h15-13h30 *Lunch break*

13h30-15h10 **SESSION 3 FUEL CYCLE**

Chair: Prof. Emilio MINGUEZ (*Universidad Politecnica de Madrid, Spain*)

- 13h30 Barbara VEZZONI (*Karlsruhe Institute of Technology, Germany*): Analysis of  
Transition Nuclear Fuel Cycles from LWRs to Gen-IV Reactors
- 14h Stéphanie DE SIO (*CEA, France*): Liquid-Liquid Extraction Media Modeling in  
Nuclear Fuel Cycle Reprocessing: Study of the Dissociation of Nitric Acid in  
Ternary Solutions and Speciation of Plutonium (IV) in TBP
- 14h30 Carlo FIORINA (*Politecnico Di Milano, Italy*): Thorium-based fast reactors:  
potential benefits and challenges
- 15h Closing the session

15h10-15h30 *Coffee break*

15h30-17h10 **SESSION 4 NUCLEAR TECHNOLOGY**

Chair: Dr. Bernard BONIN (*European Nuclear Society High Scientific Council,  
CEA, France*)

- 15h30 Oleksii GIRKA (*V. N. Karazin Kharkiv National University, Ukraine*):  
Development of steady-state compact FALCON ion source for simulation of  
interaction of fusion-relevant particle and heat fluxes with surface
- 16h Ying CAO (*SCK•CEN and KU Leuven, Belgium*): Radiation-Tolerant CMOS  
Timing Readout Circuits for Laser Detection and Ranging in Nuclear Reactors
- 16h30 Artem Aleksandrovich DOGOV (*National Nuclear Research University MEPhI  
INPE, Russia*): Software for Radiation Damage, Activation, and Transmutation  
Studies<sup>3</sup>
- 17h Closing the session

17h10-17h30 **CLOSING and AWARD OF CERTIFICATE**

Prof. Leon CIZELJ (*Jožef Stefan Institute, Slovenia*), *Chair of the Jury*

17h30-18h Jury meeting

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<sup>3</sup> This presentation is given as a part of FP7 ENEN-RU project (out of competition).

20h- **CONFERENCE DINNER - AWARD CEREMONY OF ENEN PRIZE**  
A table is arranged for the ENEN Event participants.

### **3 Laureates of the ENEN PhD Prize**

Three equal laureates of the ENEN Prize are as follows:

- Gonzalo JIMENEZ VARAS (*Universidad Politécnica de Madrid, Spain*)
- Arthur HELLOUIN DE MENIBUS (*CEA, France*)
- Kaichao SUN (*Paul Scherrer Institut / Swiss Federal Institute of Technology Lausanne, Switzerland*).

The ENEN Prizes were given by the Chair of the Jury and the ENEN Vice President at the Award Ceremony on the same day.

The laureates are granted to attend an international conference with support of the ENEN Association up to 1000 Euro (conference fee, travel, accommodation and meals – upon receipt of justification documents) and hereby encouraged to present the result of his/her research work.

### **4 Financial and logistic issues**

The cooperation of the NENE 2012 was very appreciated. It covers for the Event organization:

- ENEN is invited to make a presentation at the first plenary session, given by Leon Cizelj (*Jozef Stefan Institute, Slovenia, Chair of the Jury*)
- Time and place for the Event as a one-day parallel session (a room with PC, projector, microphone x2 (chair, speaker, audience), 50 chairs)
- One-day free ticket for 3 Jury members (only dinner for 60 Euro as below)

The main expenditures by the ENEN were:

- Registration fee for 12 students (175 Euro per person)
- Registration fee for 5 Jury members and ENEN staff (400 Euro per person)
- Dinner for 3 Jury members (60 Euro per person)
- Three ENEN Prizes (up to 1000 Euro per laureates and up to 10 Euro per frame)
- Travel expenses for 12 students (travel and 2-night accommodation)
- The rest part of the travel expenses for 8 Jury members and ENEN staff (travel and 2-night accommodation) – see below the support by JRC

The European Commission Joint Research Centre (JRC) provided the financial support (up to 5000 Euro according to the MoU) for:

- Travel expenses for 8 Jury members and ENEN staff (travel and 2-night accommodation)

It was notes that

- Cooperation by the NENE organizer was very appreciated. One-day event with 12 students and an introductory presentation on the ENEN during the plenary session was successful. Negotiation of the conference fee was acceptable.
- Details of the Event (e.g. date, financial aspect, time schedule of submission of abstracts, papers, presentations) should be agreed with the conference organizer as early as possible. Communication with the NENE organizer was very close and cooperative.

## **ENEN PhD Event 2012**

- Criteria of the selection and the ENEN Prizes should be reconsidered. (ENEN Board decision in March 2011, a paper should be original, not depending on his/her prof., the same paper can be presented at the same conf? etc.)
- An evaluation sheet for the Jury should be printed and distributed to the Jury members before the Event.
- A laser pointer and a ring are useful.
- A group picture and a picture of ENEN prize laureates should be included in the program.
- A meeting room for the Jury meeting is appreciated.
- Participation in the conference dinner is a good opportunity for further communication. A table with the Jury members and the students should be arranged.

Annex I

**The 6<sup>th</sup> ENEN PhD Event 2012**  
**21<sup>st</sup> International Conference Nuclear Energy for New Europe**  
**in Ljubljana, Slovenia, 5-7 September 2012**

2<sup>nd</sup> Announcement as of 15 May 2012

**1 Objective**

In the framework of the 21<sup>st</sup> International Conference Nuclear Energy for New Europe in Ljubljana, Slovenia, 5-7 September 2012 (<http://www.nss.si/ljubljana2012/>) the European Nuclear Education Network (ENEN) Association, in cooperation with the Joint Research Centre of the European Commission, is organizing the 6<sup>th</sup> ENEN PhD Event 2012.

The objectives of the ENEN PhD Event are:

- to provide a forum for PhD students to present their research work to their fellows and colleagues in a friendly but competitive spirit
- to promote the research work of PhD students in the nuclear fields, in particular experimental work
- to set up a bridge between PhD students and professionals in the nuclear field

**2 Date and venue**

Date: Thursday 6 September 2012

All participants are requested to attend the one-day Event, the conference dinner and the awarded ceremony of the ENEN Prize on 6<sup>th</sup> September (The details are to be informed).

Venue: Grand Hotel Union  
<http://www.gh-union.si/>

**3 General program**

The Event will consist of 12 PhD presentations nominated by ENEN Members and selected by the ENEN PhD Event Jury. The Event will be divided into 3 or 4 sessions according to the subjects. The participants will make a presentation of their research work for 25 minutes followed by 5 minutes questions and discussion.

All presentations will be judged by the Jury members on the submitted paper as well as on the quality of their presentation and on the clarity in the discussion while answering the questions and discussions. Three best presentations will be given the ENEN Prize. Please see the "Criteria and Procedure for the ENEN Prize" in *Annex I*.

A ceremony to provide the ENEN PhD Event certificates will be held at the end of the Event. The awarded ceremony of the ENEN Prizes will be held during the conference dinner on 6<sup>th</sup> September.

The members of the Jury:

- Leon Cizelj (Jozef Stefan Institute, Slovenia) CHAIR
- Bernard Bonin (European Nuclear Society High Scientific Council)
- Joseph Safieh (CEA/INSTN, France)
- Emilio Minguez (Universidad Politecnica de Madrid, Spain)
- Michel Giot (SCKCEN, Belgium)
- Petre Ghitescu (University Politechnica Bucharest, Romania)
- Rakesh Chawla (Swiss Federal Institute of Technology Lausanne, Switzerland)
- Bruno Panella (Consortium Interuniversitario, Italy)

The detailed program will be available after the selection of the participants is completed (See 6).

This Event is supported by the Joint Research Centre of the European Commission.

#### **4 Qualification for application**

Applicants should be either

- PhD students studying or working at the ENEN Members in any nuclear field, or
- those who completed their PhD studies at an ENEN Member after the application deadline of the previous ENEN PhD Event, i.e. 23 February 2011.

The criteria for selection of the participants are:

- Quality of his/her research work,
- Enough achievements at least as same as the 3<sup>rd</sup> year of PhD student, and
- No balance among the participating countries is taken into account.

All abstracts and papers submitted to the Event will be included in the Conference proceedings.

All abstract, papers and presentations provided for the Event will be shared among the ENEN Members after the Event.

All participants are requested to attend the Event, the conference dinner and the awarded ceremony of the ENEN Prize on 6<sup>th</sup> September.

For the selected PhD students, ENEN will support registration fee of the Conference as well as their travel expenses up to a certain amount as informed prior to the Event.

#### **5 How to apply**

1) Application form (See *Annex II*)

- Contact details of the student
- Contact details of the nominating ENEN Member
- Status of the PhD study
- Recommendation by ENEN Member
- Scientific CV and publication list

- Two-page **abstract** of the research work to be presented
- 2) Application form has to be sent by e-mail to  
 Ryoko Kusumi  
 Secretary General of the ENEN Association  
[ryoko.kusumi@cea.fr](mailto:ryoko.kusumi@cea.fr)
- 3) Deadline of the application: **7 June 2012**

**Note:** All selected participants will be requested 1) to submit an abstract and a paper on their research work to be presented according to the conference format, **by 26 August 2012** and 2) to submit a power point presentation **by 31 August 2012**. (See 6)

## 6 Time schedule

7 June 2012	Deadline for the application (See 5)
Mid-June 2012	Jury meeting for selection
By 18 June 2012	Inform the selected students of the final program (by e-mail) Submit the draft program to the Conference organizer
By 24 June 2012	The selected students are requested to confirm their participations in the Event, the conference dinner and the awarded ceremony (by e-mail) <b><u>NOTE: No confirmation before end of 24 June 2012 is considered as default.</u></b>
By 30 June 2012	Registration of all participants at the conference (Necessary instructions will be given) Submit the final program and arrange the payments of fee to the Conference organizer
26 August 2012	Deadline of the submission of abstract and paper by the participants All participants are requested to submit 1) abstract and 2) paper <u>according to the conference format</u> (the formats are available at the conf website) - send by email to <a href="mailto:ryoko.kusumi@cea.fr">ryoko.kusumi@cea.fr</a>
31 August 2012	Deadline of the submission of presentation by the participants – send by email to <a href="mailto:ryoko.kusumi@cea.fr">ryoko.kusumi@cea.fr</a>
5-7 September 2012	21 <sup>st</sup> International Conference Nuclear Energy for New Europe in Ljubljana, Slovenia 6th ENEN PhD Event (6 September) All participants are requested to bring a power point presentation by a memory stick to the Event. A group picture will be taken during the Event.  Conference dinner and the award ceremony of the ENEN Prize A tables will be arranged for the ENEN Event participants.



**7 Contact**

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PhD page                      <http://www.enen-assoc.org/en/activities/for-students/phd.html>

Annex II

**The 6<sup>th</sup> ENEN PhD Event 2012  
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in Ljubljana, Slovenia, 5-7 September 2012**

Criteria and Procedure for the ENEN Prize

**1. Criteria**

- 1) Quality of the paper
- 2) Clarity of the presentation: ability to communicate the message
- 3) Quality of the answers to the questions following the presentation
- 4) Ability to communicate the enthusiasm
- 5) Quality of the iconographic materials
- 6) Formal compliance with the rules (respect of the allotted time)
- 7) Active participation in the Event

**2 Procedure**

- 1) For each item, each member of the Jury give a mark comprised between 0 and 4:  
0 = null  
1 = weak  
2 = average  
3 = good  
4 = very good
- 2) At the end of the day, the totals will be summed up for each participant and an arithmetic ranking will be established.
- 3) The results will be discussed until a consensus will be found to attribute the three ENEN Prizes.



- 4 REASONS FOR NOMINATION** (ability of the candidate to perform original work, to work in team, to communicate the results of his/her work; please mention if the candidate has done some experimental work. – Should be written by the nominating ENEN Member with a signature)

**5**      **SCIENTIFIC CV AND PUBLICATION LIST** (including publications, prizes, internships abroad, participation to conferences, etc.)

**6 TITLE AND ABSTRACT OF THE PAPER (about 2 pages)**