



**The 7th ENEN PhD Event 2013
at 16th International Conference on Emerging Nuclear Energy Systems (ICENES)
in Madrid, Spain, 28-29 May 2013**

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:

- 1st ENEN PhD Event at the International Youth Conference on Energetics (IYCE 2007) in Budapest, Hungary, 1 June 2007 with the selected 12 PhD students
- 2nd Event at the International Youth Nuclear Congress (IYNC 2008) in Interlaken, Switzerland, 23 September 2008 with the selected 14 students from 11 EU countries
- 3rd 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
- 4th 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
- 5th 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
- 6th ENEN PhD Event 2012 at the framework of the 21st International Conference Nuclear Energy for New Europe (NENE) in Ljubljana, Slovenia, 6 September 2012 with selected 11 PhD students from 7 EU countries and Ukraine and a PhD student invited from Russian Federation in the framework of FP7 ENEN-RU project

In the framework of the 16th International Conference on Emerging Nuclear Energy Systems (ICENES) in Madrid, Spain, 26-30 May 2013¹ the 7th ENEN PhD Event 2013 was taken place, co-sponsored by the European Nuclear Education Network Association (ENEN), the European Commission Joint Research Centre (JRC), and the Institute of Nuclear Fusion of the Universidad Politécnica de Madrid (UPM), the organizer of ICENES 2013.

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

¹ <http://www.icenes2013.org/>

The members of the Jury for the Event 2013 are:

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

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 program is divided into two parts, i.e. Session 1 and Session 2 on 28th May in the afternoon and Session 3 and Session 4 on 29th May in the morning.

A group picture was taken at the end of the first day.

The selected 12 presentations were judged by the Jury members by the criteria given at Annex II. The Jury meeting was held after the Event to select three ENEN Prizes.

The Award Ceremony took place during the Official Banquet on 29th May. Two tables were arranged for the students and Jury members.

2 Program of the Event

Tuesday 28th May

13h30-13h40 **OPENING**

Prof. Emilio MINGUEZ (Universidad Politecnica de Madrid, Spain), *Chair of the Jury*

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

13h40-15h10 **SESSION 1 REACTOR PHYSICS**

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

13h40 David JALUVKA (*SCK•CEN, Belgium*): MYRRHA Core Loading Pattern Optimization using Metaheuristics

14h10 Andrea BARBARINO (*CIRTEN- POLITECNICO DI TORINO, Italy*): Mathematical models and numerical solutions for core calculations

14h40 Miguel MAGAN (*UPM, Spain*): Neutronic Performance for an ESS-size neutron source: A perspective of target and moderator choices

15h10 Closing the session

15h10-15h30 *Coffee break*

15h30-17h **SESSION 2 REACTOR SAFETY**

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

- 15h30 Vaclav TYRPEKL(*CEA. France*): Material effect in the corium-water interaction: Structural analysis of steam explosion debris and solidification mechanism
- 16h Patrizio CONSOLE CAMPRINI (*CIRTEN – University of Bologna, Italy*): Improved Power Transient Analyses of Core and Reflector Experimental Devices for Jules Horowitz Material Testing Reactor (JHR)
- 16h30 Angelo INFANTINO (*CIRTEN – University of Bologna, Italy*): Study of advanced aspects of radiation protection in the use of particle accelerators in medical field
- 17h Closing the session

17h15 GROUP PICTURE

Wednesday 29th May

8h30-10h **SESSION 3 FUSION**

Chair: Prof. Bruno PANELLA (*CIRTEN, Italy*)

- 8h30 Ievgeniia BORGUN (*V. N. Karazin Kharkiv National University, Ukraine*): Powerful EUV Generation during Target Plasma Irradiation by Electron Beam
- 9h Enric BARGALLO (*UPC, Spain*): IFMIF accelerator facility RAMI analysis in the engineering design phase
- 9h30 Roberto BONIFETTO (*CIRTEN - Politecnico di Torino, Italy*): Thermal-hydraulic modelling of superconducting magnets for fusion applications
- 10h Closing the session

10h-10h30 *Coffee break*

10h30-12h **SESSION 4 NUCLEAR CHEMISTRY AND FUEL CYCLE**

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

- 10h30 Emmanuelle NOTTOLI (*CEA. France*): Determination of Long-lived Radionuclides (¹⁰Be, ⁴¹Ca, ¹²⁹I) Concentrations in Nuclear Waste by Accelerator Mass Spectrometry
- 11h Ali Al-ADILI (*Uppsala University, Sweden*): Studies on ²³⁴U(n,f) as a function of excitation energy
- 11h30 Gaillard JEREMY (*CEA. France*): Reactivity of water at oxide surface: surface chemistry and radiolysis
- 12h Closing the session

12h15-13h **CLOSING and AWARD OF CERTIFICATE**

Prof. Emilio MINGUEZ (*Universidad Politecnica de Madrid, Spain*), *Chair of the Jury*

13h-14h Jury meeting during lunch

17h- 23h **CONFERENCE DINNER - AWARD CEREMONY OF ENEN PRIZE**
A tables is arranged for the ENEN Event participants.

3 Laureates of the ENEN PhD Prize

Three equal laureates of the ENEN Prize are as follows:

- Roberto BONIFETTO (*CIRTEN - Politecnico di Torino, Italy*)
- Ali Al-ADILI (*Uppsala University, Sweden*), and
- Patrizio CONSOLE CAMPRINI (*CIRTEN – University of Bologna, Italy*)

The ENEN Prizes were given by the Chair of the Jury and two more Jury members at the Award Ceremony during the Official Banquet on 29th May.

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 ICENES 2013 was very appreciated. It covers for the Event organization:

- ENEN is invited to make a presentation at one of the conf sessions, given by Ryoko Kusumi, Secretary General of the ENEN
- Time and place for the Event as two half-day parallel sessions (a room for 50 persons, PC, projector, microphone)
- Conference fee (to attend the PhD Event only) and the Official Banquet for 2 Jury members, 1 JRC and 2 ENEN Staff (1 ENEN staff cancelled,).

The main expenditures by the ENEN were:

- Three ENEN Prizes (up to 1000 Euro per laureates and up to 10 Euro per frame)
- Travel expenses for 12 students (travel and 3-night accommodation)
- The rest part of the travel expenses for 4 Jury members and 1 ENEN staff (travel and 3-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 4 Jury members and 1 ENEN staff (travel and 2-night accommodation)

It was notes that

- Cooperation by the ICENES 2013 organizer was very appreciated. Two half-day event with 12 students and an presentation on the ENEN during the conference was successful.
- UPM, the ICENES 2013 organizer co-sponsored the Event, together with ENEN and JRC.
- 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 ICENES 2013 organizer was very close and cooperative.
- Program and Evaluation sheet for the Jury should be printed and distributed to the Jury members at the beginning of 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.
- Not so many applications received from the ENEN members. Only limited ENEN Members reacted. This should be improved.

Annex I

**The 7th ENEN PhD Event 2013
at 16th International Conference on Emerging Nuclear Energy Systems (ICENES)
in Madrid, Spain, 28-29 May 2013**

3rd Announcement as of 8 March 2013

1 Objective

In the framework of the 16th International Conference on Emerging Nuclear Energy Systems (ICENES) in Madrid, Spain, 26-30 May 2013 (<http://www.icenes2013.org/>) the European Nuclear Education Network (ENEN) Association, in cooperation with the Joint Research Centre of the European Commission, is organizing the 7th ENEN PhD Event 2013.

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: Tuesday 28 and Wednesday 29 May 2013

All participants are requested to attend the ENEN PhD Event, the conference dinner and the awarded ceremony of the ENEN Prize on 28 (in the afternoon) and 29 May 2013

Venue: School of Industrial Engineering(ETSII), Universidad Polotecnica de Madrid, Madrid, Spain

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 29th May.

The members of the Jury:

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

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. 7 June 2012.

The criteria for selection of the participants are:

- Quality of his/her research work,
- Enough achievements at least as same as the 3rd 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 28 (in the afternoon) and 29 May 2013.

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

3) Deadline of the application: **31 March 2013**

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 10 May 2013** and 2) to submit a power point presentation **by 17 May 2013**. (See 6)

6 Time schedule

- 31 March 2013 Deadline for the application (See 5)
- Beginning of April 2013 Jury meeting for selection
- By 12 April 2013 Inform the selected students of the final program (by e-mail)
Submit the draft program to the Conference organizer
- By 18 April 2013 The selected students are requested to confirm their participations in the Event, the conference dinner and the awarded ceremony (by e-mail)
NOTE: No confirmation before end of 18 April 2013 is considered as default.
- By 25 April 2013 Registration of all participants at the conference (Necessary instructions will be given)
Submit the final program and arrange the payments, if necessary, to the Conference organizer and/or the hotel
- 10 May 2013 Deadline of the submission of abstract and paper by the participants
All participants are requested to submit 1) abstract and 2) paper according to the conference format (the formats are available at the conf website) - send by email to ryoko.kusumi@cea.fr
- 17 May 2013 Deadline of the submission of presentation by the participants – send by email to ryoko.kusumi@cea.fr
- 28 and 29 May 2013 7th ENEN PhD Event
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

Ryoko Kusumi Secretary General of the ENEN Association
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Email ryoko.kusumi@cea.fr Web site <http://www.enen-assoc.org>
PhD page <http://www.enen-assoc.org/en/activities/for-students/phd.html>

Annex II

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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 and active participation in the Event
- 5) Quality of the iconographic materials
- 6) Formal compliance with the rules (respect of the allotted time)

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)