

Title of partnership:**FUSION-EP International Network for Nuclear Fusion Education****Masters Course running the Partnership:**

FUSION-EP European Master in Nuclear Fusion Science and Engineering Physics

Duration: 3 years

Summary description:**1. Objectives (in line with the general objectives of the FUSION-EP master)**

The EU is world leader in the development of controlled thermonuclear fusion research using magnetic confinement (MCF) as a sustainable energy source. The key action in the Euratom Framework Programme focuses on research activities concerning the fusion reactor aspects, within the framework of the international cooperation ITER (International Thermonuclear Experimental Reactor, to be built in Cadarache, France). As this ITER project implies that EU and non-EU scientists and engineers will work together, it is essential to promote common education already at Master level. Therefore, the ultimate objective of the Partnership is to develop the current Erasmus Mundus FUSION-EP consortium into a worldwide research based network of excellence for education in nuclear fusion science & engineering physics with the following specific goals:

- increasing the already existing interaction between the organising institutions of the research-oriented FUSION-EP and centres of excellence institutions in non-EU countries working on fusion R&D.
- diffusing the knowledge about the European model of MCF development
- enhancing the quality of European higher education through supporting R&D training of European students, thereby widening their perspective and personalising their career development.
- increasing the teaching capacities to respond to needs in the partner institutions
- increasing the interaction between EU and non-EU countries with respect to research, practices and policies of fusion R&D through exchanging expertise.
- exchange and institutionalization of teaching methodologies, developing common evaluation methods, developing e-learning methods.
- enhancing international profile and visibility of European higher education
- increasing the outreach of the FUSION-EP by using the partner institutions as reference points for interested non-EU students.
- establishment of long-standing international collaboration in higher education and fusion R&D .

These objectives are to be achieved over a period of three years.

2. Duration:

The duration of the partnership is three years, including academic year 2007-2008, academic year 2008-2009, and academic year 2009-2010

3. List of partners

The 5 partners in this network are selected based on following criteria: outstanding and worldwide recognised institutes for teaching and research on fusion R&D in their part of the world, having established links with FUSION-EP institutes, being considered as a regional reference centre for fusion R&D and having a course and research programme that provides added value for EU students and scholars of the FUSION-EP partners Universiteit Gent (Belgium), Université Henri Poincaré (France), Kungliga Tekniska Högskolan (Sweden), Universidad Complutense de Madrid & Universidad Carlos III de Madrid & Universidad Politécnica de Madrid (Spain), and Universität Stuttgart (Germany) . By having partner institutes from different regions in the world, we want to expose students and scholars of the network to the knowledge about and insight in the specific fusion R&D problems in these different parts of the world.

Partner Action 3	Country	Region
1 UCLA	USA	North America
2 University of Wisconsin-Madison	USA	North America
3 St. Petersburg State Polytechnic University	Russia	Europe
4 Moscow Engineering Physics Institute	Russia	Europe
5 University of Science and Technology of China	China	Asia

A later extension of the Partnership to other countries is envisaged.

4. Activities and role of third country institutions:

Given our objective to exchange experiences on specific fusion R&D problems within different parts of the world, the activities aim to increase the exposure and exchange on fusion R&D issues in different parts of the world by:

- participation in a seminar on fusion R&D with presentations from scholars and students from both FUSION-EP institutes and partner institutes, during the yearly FUSION-EP summer event.
- participation of non-EU students in EU summer schools
- exchange of theoretical and practical knowledge on fusion R&D practices within the network

The specific role of the third country partner institutes will be:

- to actively participate in the exchange and diffusion of knowledge on fusion R&D issues and in the improvement of FUSION-EP teaching programmes and practices
- hosting and inclusion of EU FUSION-EP students and scholars in their educational programme
- collaboration and supervision within research activities of EU students and scholars

5. Outgoing mobility scheme students:

a. Selection criteria for students: EU nationality, knowledge of English, relevant research topic for dissertation (research proposal), motivation for exchange, academic performance in the first master year

b. Number of outgoing students per year: in total maximum 15 students per year (number increasing from the first to the third year), in principle maximum 3 students per FUSION-EP consortium partner .

c. Duration of stay: the students of the second FUSION-EP master year stay in principle 3 months;

d. If the student follows elective courses (within one of the three pre-defined FUSION-EP study tracks) during the third FUSION-EP semester, he/she will be accredited ECTS upon passing exams according regulations from hosting institute; if the student conducts research for his/her dissertation (within one of

the three pre-defined FUSION-EP study tracks) during the fourth FUSION-EP semester, he/she will produce a research progress report approved by his/her supervisor from the hosting institute jointly with both his FUSION-EP thesis supervisors.

e. All academic activities of EU students in third country institutes will be fully recognised for their FUSION-EP Master curriculum (ECTS credit points).

f. Language of instruction for students: English.

Outgoing mobility scheme scholars:

a. Selection criteria for scholars: EU national, relevant research topic or educational contribution; motivation for exchange; clearly elaborated plan of activities; potential contribution to further development of partnership and/or joint research and education related to fusion R&D;

b. Number of outgoing scholars per year: in total 6 scholars per year (two to each partner country);

c. Duration of stay: 6 scholars stay in total 9 months with the partner institutions; maximum stay 3 months

d. Work carried out by scholar: scholar will conduct research, contribute to the education in the field of fusion R&D at the hosting institute and explore potential further research/education collaboration.

e. Language of work for scholars: English

European Partners:

- 1) BE – Ghent University
- 2) FR - University Henri Poincaré
- 3) SE – The Royal Institute of Technology
- 4) ES - Complutense University of Madrid
- 5) ES – **University Carlos III de Madrid**
- 6) ES – Polytechnic University Madrid
- 7) DE – Stuttgart University

Third-Countries Partner Institutions:

- 1) UCLA (USA)
- 2) University of Wisconsin-Madison (US)
- 3) St. Petersburg State Polytechnic University (Russia)
- 4) Moscow Engineering Physics Institute (Russia)
- 5) University of Science and Technology of China (China)

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