ELAMAT – AN INITIATIVE TO HOST THE IFMIF/DONES FACILITY IN POLAND

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Fusion energy will require materials, which maintain good mechanical and thermal properties and do not remain highly radioactive for long after exposure to neutrons inside the reactor. International Fusion Materials Irradiation Facility (IFMIF) will carry out testing and qualification of advanced materials under conditions similar to those of a future fusion power plant. IFMIF is an accelerator-based neutron source that will use Li(d,xn) reactions to generate a flux of neutrons with a broad peak at 14 MeV equivalent to the conditions of the Deuterium-Tritium reactions in a fusion power plant.

IFMIF is an important step on the European Roadmap to the realisation of fusion energy which will allow the construction of the Demonstration Fusion Power Reactor (DEMO) to follow ITER by 2050. Preparations for the construction of IFMIF are handled by the Fusion for Energy and the EUROfusion consortium which are both European Union's Joint Undertakings. Since 2013, within the IFMIF Engineering Validation and Engineering Design Activities (EVEDA) a smaller prototype of IFMIF is under construction in Japan. At the same time, the EUROfusion Early Neutron Source Work Package has started work on preparation of the Engineering Design Report for IFMIF/DONES – a DEMO-Oriented Neutron Source - that will be ready for construction in 2020. Poland is one of the host countries considered for the site of the future facility.

The Joint European Laboratory for Advanced Materials Testing (ELAMAT) is an initiative to host the IFMIF facility in Poland. The consortium is led by the Rzeszów University of Technology. Its members are three national universities, research institutes and business environment institutions. A green field location for the IFMIF facility has been proposed 15 km north of Rzeszów in Podkarpackie region.

As part of the IFMIF/ELAMAT initiative a Science Committee was appointed with members representing prominent institutions active in nuclear physics research from Poland, France, Italy and other countries. The role of the Science Committee is to prepare a science program in nuclear physics and in other scientific areas, to complement the basic fusion related material testing program of IFMIF. At present a number of working groups of the Science Committee are working on proposals to use the IFMIF facility for the production of radioactive targets, radioactive ion beams, studies of astrophysical reactions with neutrons, neutrino oscillations, nuclear waste transmutation and radiopharmaceuticals production as well as for lifetime of components, industrial material testing, material doping, and other technology related studies. This work will be concluded early next year by the preparation of a Science Case White Book for the IFMIF/ELAMAT facility.