

SEEIIST

SOUTH EAST EUROPEAN INTERNATIONAL INSTITUTE FOR SUSTAINABLE TECHNOLOGIES

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The states in South East Europe are joining forces to set up a large-scale competitive research infrastructure – the South East European International Institute for Sustainable Technologies (SEEIIST, <https://seeiist.eu>). Due to the recent history in South East Europe all scientific and economic activities have very much slowed down. As a consequence this region has suffered ever since from a strong brain drain of the young generation, affecting in particular the best.

In contrast, the same region had in the past an intensive technological development and made significant scientific contributions on an European scale. Prime examples are the first research nuclear reactor in this region operated already in 1959, just two years after such a research reactor started operation in Germany, and the role of the region as one of the founding members of CERN in 1954. To recover this tradition, *i.e.* to decrease the present large gap compared to the rest of Europe and to revert the brain drain, the most efficient way is to establish a large-scale internationally competitive research infrastructure in South East Europe.

The objective of this project is to foster regional cooperation in the fields of science, technology and industry in the spirit of the CERN and SESAME models ‘Science for Peace’. This would greatly help to address common challenges and needs in SEE, helping in particular to develop sustainable economy and social cohesion. Capacity building and the slowing down if not reversal of the brain drain would become immediate benefits.

About two years ago the Government of Montenegro initiated the establishment of the SEEIIST Project, originally proposed by Prof. Herwig Schopper, a former Director General of CERN. This Initiative was formalized as a Regional project after signing a **Declaration of Intent** on 25 October 2017 at a Ministerial meeting at CERN (Figure 1, top). The Signatory Parties were Albania, Bosnia and Herzegovina, Bulgaria, Kosovo¹, Montenegro,



FIG 1: Signature of Declaration of Intent at CERN by Ministers of Science/Corresponding Ministers (top); Signature of Memorandum of Cooperation by Prime Ministers of the Region at the Summit of the Berlin Process at Poznan (bottom).



¹ This designation is without prejudice to positions on status and is in line with UNSC 1244/1999 and the ICJ opinion on the Kosovo Declaration of Independence

Serbia, Slovenia and North Macedonia. Croatia and Greece took an observer status. Most recently, a SEEIIST **Memorandum of Cooperation** was signed by six Prime Ministers of the Region on 5 July 2019, at the occasion of the Summit of the Berlin Process at Poznan, Poland (Figure 1, bottom).

The core of the Project is a **‘Facility for Tumour Therapy and Biomedical Research with Protons and Heavier Ions’** which today present the most modern and most successful method for treating a large number of different cancer types. In Europe, four facilities of this kind exist, in Germany HIT in Heidelberg (Figure 2, left) and MIT in Marburg, CNAO in Pavia/Italy and MedAustron in Vienna/Austria. However, such a therapy centre does not exist in the SEE Region, where a perpetually growing number of tumours have been registered in recent years. Heavy ion treatments are still in the pioneering phase. Beyond the treatment of patients, it is therefore planned to dedicate 50% of the beam time to research with multi-ion sources (beyond presently used protons and carbon ions), making the SEEIIST project unique in the world. With its double task to treat patients and to perform research, the SEEIIST project would present one of the best examples of **‘Science for Society’** projects.

The creation of the Facility will offer numerous opportunities for technology transfer to the SEE-states. In particular, this will be a great benefit for the SEE local industry since the procurement of the different components for the machine and beam lines (magnets, vacuum system, girders, beam lines, power supplies, control system, etc.) can be preferentially assigned to local industry. Moreover, the initiative will give rise to spin-offs not directly linked to the facility, but also trigger complementary technologies.

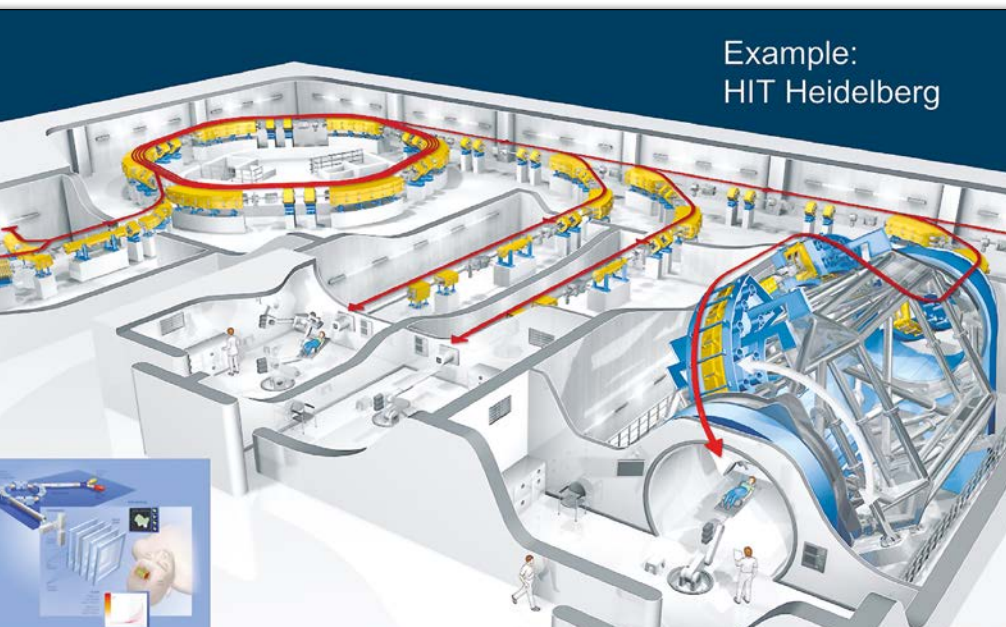
Thanks to the first financial support by the European Commission – Directorate General for Research and Innovation (EC DG RTD) the SEEIIST project is now entering into a Design Study Phase which will be hosted in the renowned research centers CERN and GSI. In the past, CERN has indeed rendered very valuable services to European science beyond its main task by offering help for the foundation of EMBO and ESO, not to mention the invaluable support given to the SESAME project. At GSI the first 440 patients were treated in Europe with this most modern method. The preparatory groups have just been set up. The central goal would be to push a next generation facility for tumour therapy and biomedical research with multi-ion sources, which would even be a benefit for Europe as a whole.

About the Author



Sanja Damjanovic made her Diploma in Physics at the University of Belgrade. She continued with PhD studies in 1999 at the Faculty of Physics and Astronomy, Ruprecht-Karls University Heidelberg, Germany, and received her Dr.rer.nat. in Physics in 2002 with the Grade ‘Magna cum laude’. In 2006 she obtained a CERN Fellowship, an award-type position. Since 1999 embedded in international teams, she has ever since worked in two large International Organizations, at CERN in Geneva and at GSI-FAIR in Darmstadt, covering both basic and applied research in the field of high-energy nuclear physics. About 100 publications in refereed journals and conference proceedings. About 50 technical reports and numerous colloquia, seminar- and conference talks all around the world. In November 2016 she was appointed as Minister of Science in the Government of Montenegro.

▼ FIG 2: First Hadron Cancer Therapy Machine in Europe – HIT Heidelberg (left); The potential Member States of the South East Europe (right). at Poznan (right).



Example: HIT Heidelberg

