

Large-Scale Research Facilities for South East Europe -SEEIIST

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speaking on behalf of the SEE
Intergovernmental Steering Committee

Joint South-East European International Institute for Sustainable Technologies (SEEIIST) will be a creation in the spirit of 'Science for Peace'

Positive reception by a numerous International Organizations



Initiative proposed by Prof. Herwig Schopper,
former Director General of CERN



Chronos



Kairos



Trieste, January 2018, Herwig Schopper told us:

As a walk up this morning, Kairos came to me, and whispered to my ear:

“NOW IT IS A RIGHT TIME TO DO THIS PROJECT FOR SEE”



The main objectives of the Project

- ❖ Fostering **collaboration in science, technology and industry**.
- ❖ Providing **education and training platforms**,
- ❖ Promoting mitigation of the **tensions between countries** in the region.
- ❖ Establishing a **research nucleus** in the SEE region by bringing scientists, engineers and industry people from different countries to work together.
- ❖ Promoting another **'CERN model' of 'Science for Peace'**
- ❖ Large Scale Facility will introduce **'first class research'** and thereby **revert brain drain** and assure high competitiveness in the ERA.

Importance of the Project for the Region

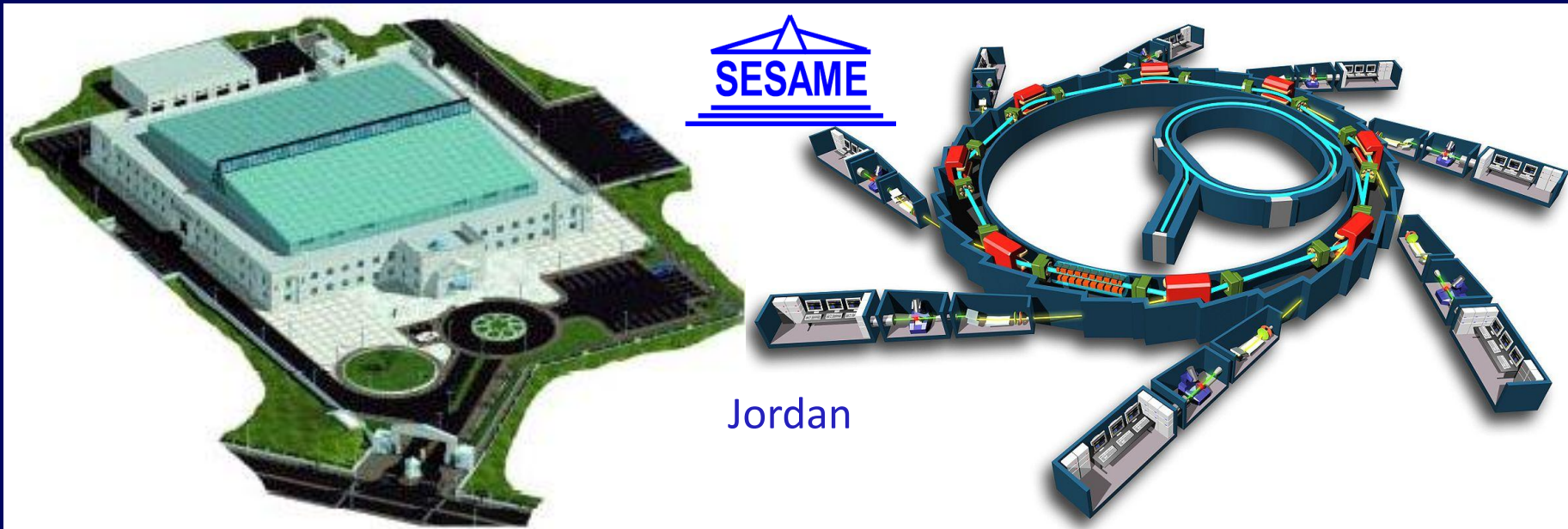
- The project would be unique in the whole region
- International cooperation, bringing people together in the spirit of 'Science for Peace' could contribute to
 - ❖ develop the regional economy
 - ❖ improve the standard of living
 - ❖ reduce unemployment (in particular for young people)
 - ❖ revert brain drain
 - ❖ aim at excellence
 - ❖ trigger 'industrialization' of the region based on sustainable technologies
 - ❖ 'knowledge-based society and economy'

Summary of the mission of the SEEIIT Project

- Science for Peace
- Scientific Excellence
- International Collaboration
- Sustainable development of society
- Education
- Technology Transfer and boost of Innovation
- Development of powerful digital network

A SUCCESS STORY

SESAME: 'Synchrotron Light for Experimental Science and Applications in the Middle East'



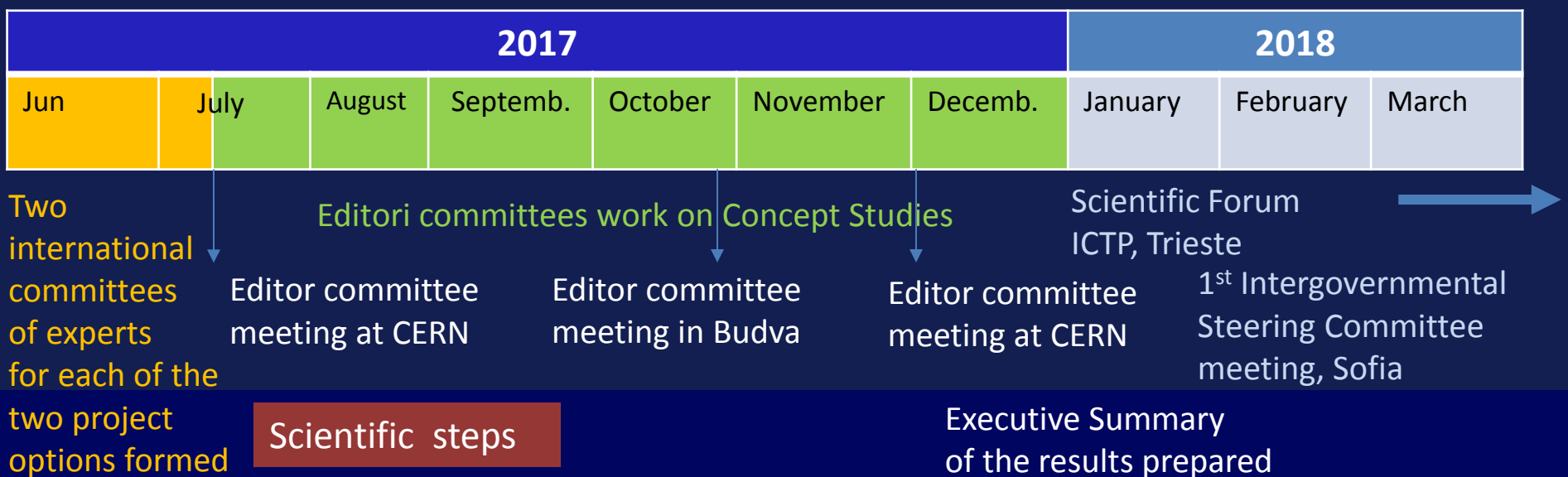
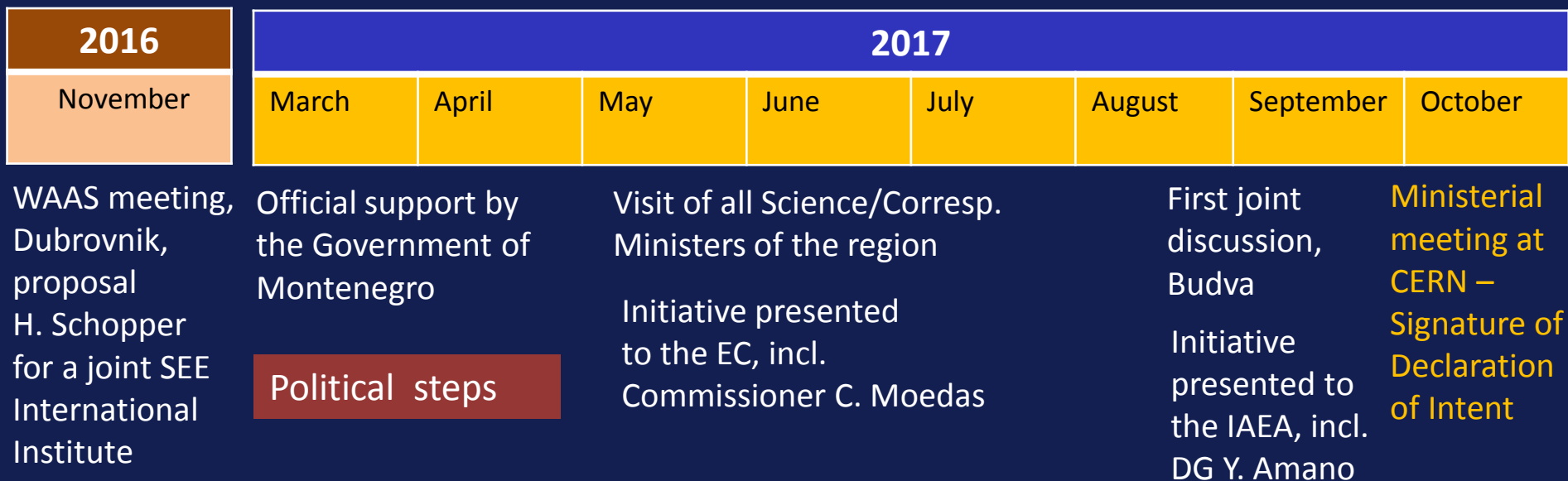
The first President of Council of SESAME - Prof. Herwig Schopper

Success story demonstrated in SESAME project:



9 member states of different political systems and religions in the Middle East: Bahrain, Cyprus, Egypt, Israel, Iran, Jordan, Pakistan, Palestinian Authority, Turkey; all of them to peacefully working together for the good of the humanity

The first preparatory steps during 2017 towards the realization of a SEE Project



Candidate Members for the South-East European International Institute for Sustainable Technologies



* This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence.

Declaration of Intent signed at CERN on October 25, 2017



Signed by eight parties:

Albania, Bosnia and Herzegovina, Bulgaria, Kosovo*, The former Yugoslav Republic of Macedonia, Montenegro, Serbia and Slovenia. Croatia agreed 'ad referendum', Greece is presently an observer



SEE Ministers of Science/Corresponding Ministers or their representatives at CERN

* This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence.

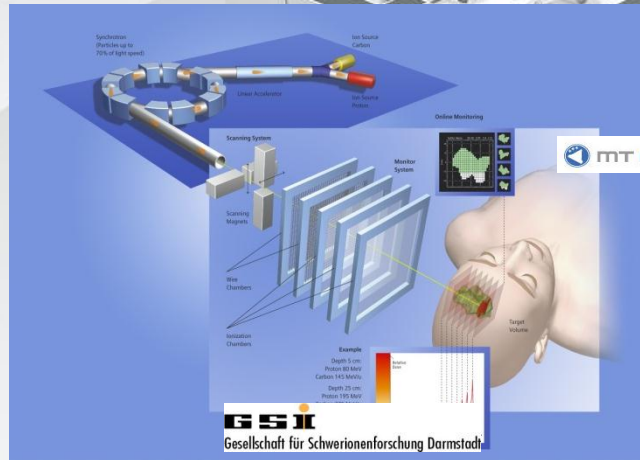
Proposed are two complementary options, both based on most advanced technologies

1. Synchrotron for hadron radiotherapy and research
2. IV generation Synchrotron for fundamental research and applications

Option 1: Facility for Tumor Therapy and Biomedical Research with protons and heavier ions

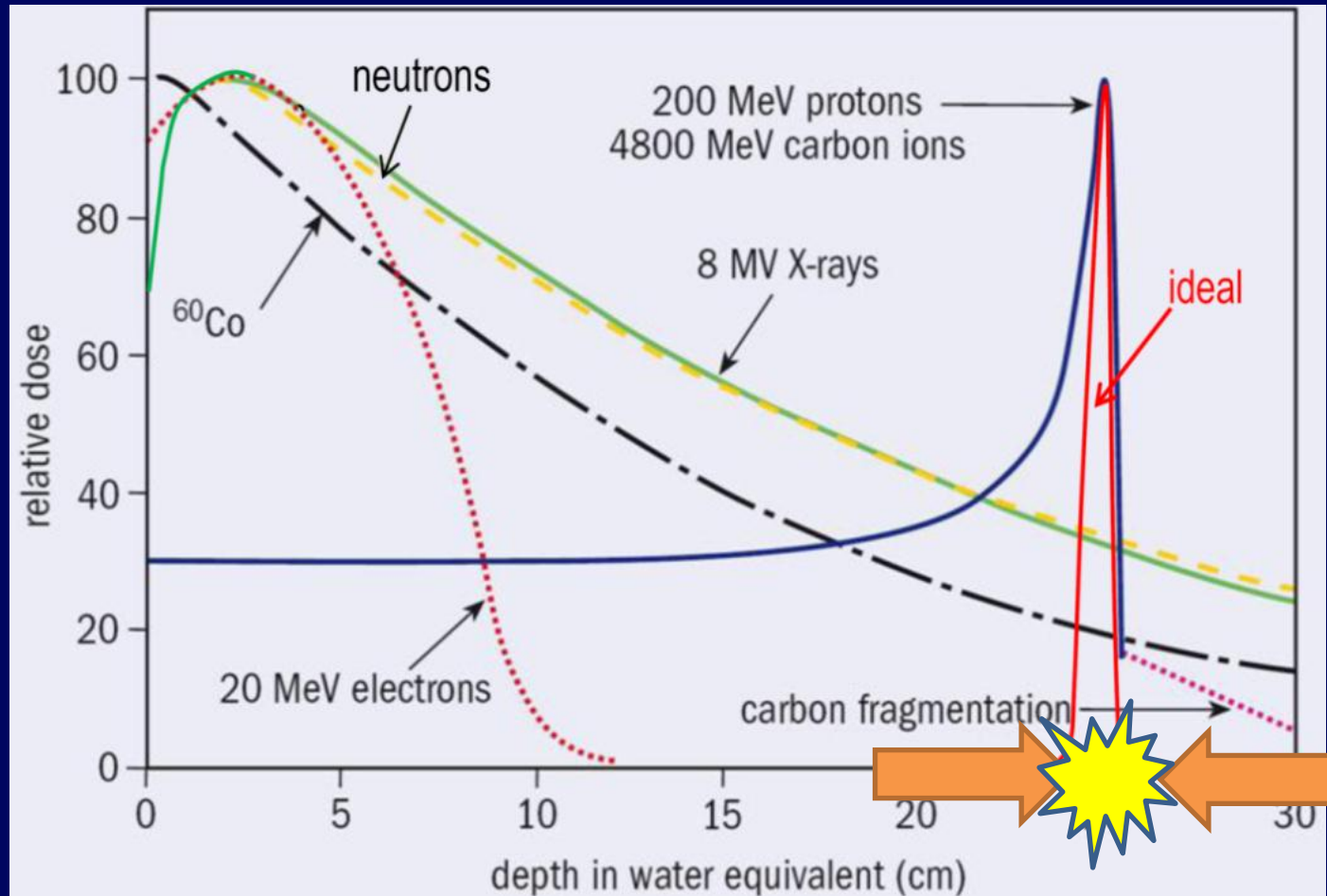
50% beam time –cancer treatment for ~500 patients/y (for population of 20M).
50% beam time - biomedical research, ~1000 researchers.

HIT Heidelberg



MT AEROSPACE

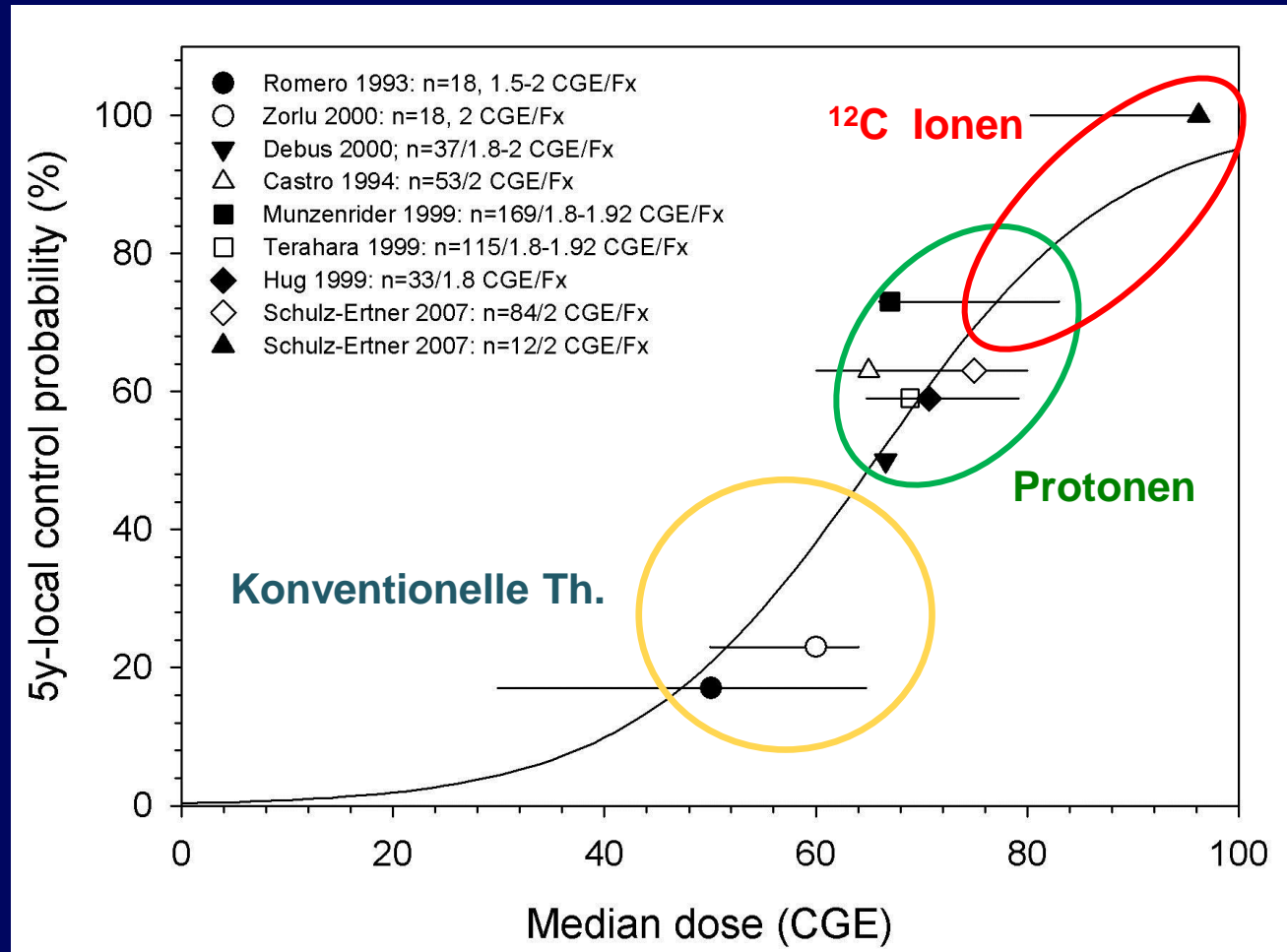
What are the Advantages of the Hadron Cancer Radiation Therapy with protons and heavier ions?



Tumor

Results of proton therapy: Chordomas of the Skull Base

Survival probability: 5 years after treatment



Deposited dose along the tissue depth

SCIENTIFIC REPORTS



OPEN

Feasibility Study on Cardiac Arrhythmia Ablation Using High-Energy Heavy Ion Beams

Received: 08 August 2016
Accepted: 09 November 2016
Published: 20 December 2016

H. Immo Lehmann^{1,*}, Christian Graeff^{2,*}, Palma Simoniello², Anna Constantinescu², Mitsuru Takami¹, Patrick Lugenbiel³, Daniel Richter^{2,4}, Anna Eichhorn², Matthias Prall², Robert Kaderka², Fine Fiedler⁵, Stephan Helmbrecht⁵, Claudia Fournier², Nadine Erbedinger², Ann-Kathrin Rahm³, Rasmus Rivinius³, Dierk Thomas³, Hugo A. Katus³, Susan B. Johnson², Kay D. Parker², Jürgen Debus⁶, Samuel J. Asirvatham¹, Christoph Bert^{2,4}, Marco Durante^{2,7} & Douglas L. Packer¹

Option 2: 4th Generation Synchrotron Light Source with a new technique used for the first time in Lund, Sweden

- * Science community of SEE would be unified
- * Over 1000 researchers and
- * Various applications from biology up to industrial aspects

MAX IV Laboratory
MAX IV Laboratory
APR 2013

Max IV Lund



Director Dr. Christoph Quitmann

WINNER
mipim
awards
BEST FUTURA
PROJECT
2014

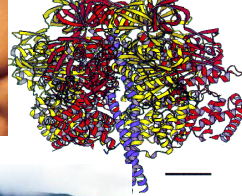
Applications of Synchrotron Light

Examples of possible research domains which are relevant for the region

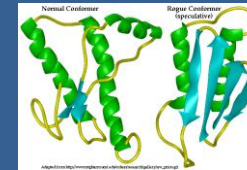
Archaeology



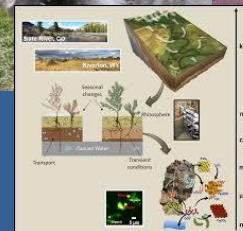
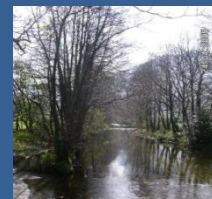
Medicine



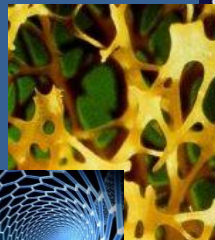
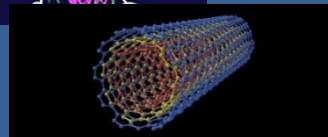
Energy



Environment



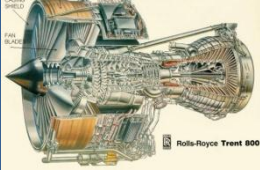
Chemistry & Materials



Physics



Engineering



Arts



Members of the Editor Committee for Option I – Facility for Tumour Therapy and Biomedical Research with p and heavier ions



Dr. Sandro Rossi - Direttore Generale CNAO

Dr Sandro Rossi, Director of CNAO in Pavia, Italy

Chairman



Prof. Ugo Amaldi, President of TERA, Novara, Italy



Prof. Manjit Dosanjh, Staff at CERN



Prof. Philippe Lambin, Head of Radiation Oncology, University of Maastricht, Maastricht, Netherlands



Dr. Michael Scholz, Scientific Head of Biophysics Departm. GSI, Darmstadt, D



Prof. Brita Singers Sorensen, Depar. of Clinical Medicine, Denmark



Prof. Dr. Jacques Balosso, CHU Grenoble Alpes, FR

Members of the Editor Committee for Option II – 4th Generation Synchrotron Light Source



Dr Amor Nadji, Director of Sources and Accelerator Division of SOLEIL, France

Chairman



Dr Dieter Einfeld, former Technical Director of SESAME and ALBA



Dr. Pedro Fernandez-Tavarez, Machine-Director of MAX IV Lund, Sweden



Prof. Riccardo Bartolini, University Oxford and Diamond, UK



Dr. Trevor Rayment, University of Birmingham, UK



Dr. Christoph Quitmann, Director of MAX IV, Sweden

Status of the scientific developments

Concept Studies created by the Editor Committees

Executive Summary
of the Concept
Studies prepared
for the Forum

Basic concepts for a SOUTH-EAST EUROPE INTERNATIONAL INSTITUTE FOR SUSTAINABLE TECHNOLOGIES (SEEIIST)



January 15, 2018

- Main elements of
a **Business Plan**:
- technical parameters of the facilities
 - time schedule
 - investment costs
 - operation costs

Culmination of the large effort invested over the year 2017

FORUM on New International Research Facilities in South East Europe

develop a research excellence nucleus in SEE
benefit for science and technology, training, investment in young people,
job creation, reverse of brain drain, knowledge based economy

Two options for the Institute:

- **4th Generation Synchrotron Light Source**
- **Facility for Tumour Therapy and Biomedical Research with protons and heavier ions**

SCIENCE FOR SOCIETY

Organizing Committee:

Herwig Schopper (Chairman, former DG of CERN)
Fernando Ferroni (President of INFN)
Christoph Quitmann (Director of MAXIV, Sweden)
Nicholas Sammut (Deputy Dean, University of Malta)
Hans J. Specht (Heidelberg Univ., former DG of GSI)
Ruediger Voss (President of EPS)

Local Organizers:

Nadia Binggeli (ICTP)
Saša Ivanović (MNA)

Registration to the Forum is free. For a restricted number of participants from the region travel subsistence would be possible. Please register at <http://indico.ictp.it/event/8408/>

ICTP and Ministry of Science Montenegro



**25 & 26 January 2018,
ICTP, Trieste, Italy**



Forum on New International Research Facilities for South East Europe, held at the ICTP/Trieste on January 25-26, 2018

More than 100 participants, among them representatives from the EC (DG for Research and Innovation - Robert Jan Smits), Chair of the ESFRI (Giorgio Rossi), representatives of the IAEA, Secretary General of the EPS, RCC, ... representatives of the SEE Steering Committee, but also high-level representatives from the scientific community: the Medical and Technical Directors of HIT Heidelberg, the Director of CNAO, Administrative Director of SESAME. From the major European laboratories five representatives from CERN including the Director of Accelerator and Technology, and the deputy Director of DESY and the Research Director of GSI-FAIR.

Thanks to the financial help of the IAEA and some help from the EPS, more than 40 Users from the Region could participate in the Forum.

Forum on New International Research Facilities in South East Europe, ICTP, Trieste 25-26 January 2018



Outcome of the Forum

- ❖ The Forum was a great success in confirming the interest both in the science-policy and the scientist communities
- ❖ An important basis for the next steps was provided:
 - Support from the IAEA for Capacity Building declared – 0.5 MEUR offered to start the Training Program – Application to the IAEA has to be submitted by April 2018
 - EC representatives are looking favourable at the project – potentially providing resources to support the next step, the preparation of the Concept Design Report
- ❖ One of the two options should be selected - decision to be made by the end of March 2018, at the second Intergovernmental Steering Committee meeting in Tirana, Albania

The next political and scientific-technical steps

- ❖ Prepare proposals for funding requests
- ❖ Form an Executive (future Directors)
- ❖ Start training programs for young people in 2018
 - for technical operation crew
 - for future Users community
- ❖ Concept Design Report (CDR)
- ❖ Decision on Selection of site (s)

Sources of funding

Politically widely accepted that the SEE region needs economic help and further stabilization.

Europe needs SEE, and SEE needs Europe.

Hence main investment from EU programs (EU members and Non-members)

EUR 150 - 200 million required per project guaranteeing competitive research in the ERA

Few days after the Forum – First SEE Intergovernmental Steering Committee Meeting in Sofia, Bulgaria



Reception by the President of the Republic of Bulgaria, Mr. Rumen Radev

Chairperson elected: Dr. Sanja Damjanovic, Minister of Science of Montenegro

Proposal by the President of Bulgaria: **Signature of the Memorandum of Cooperation by the Prime Ministers of the SEE Region at the EU-WB Summit on 17 May 2018 in Sofia**

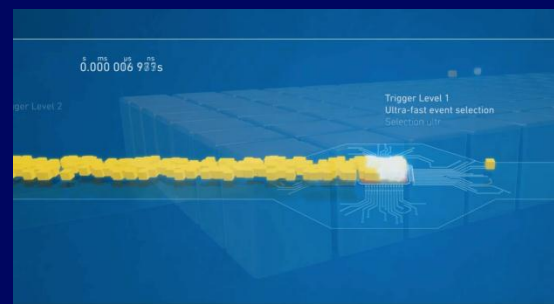
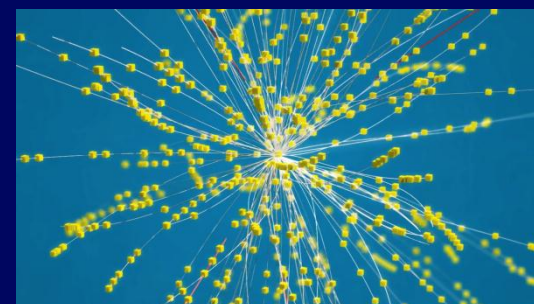
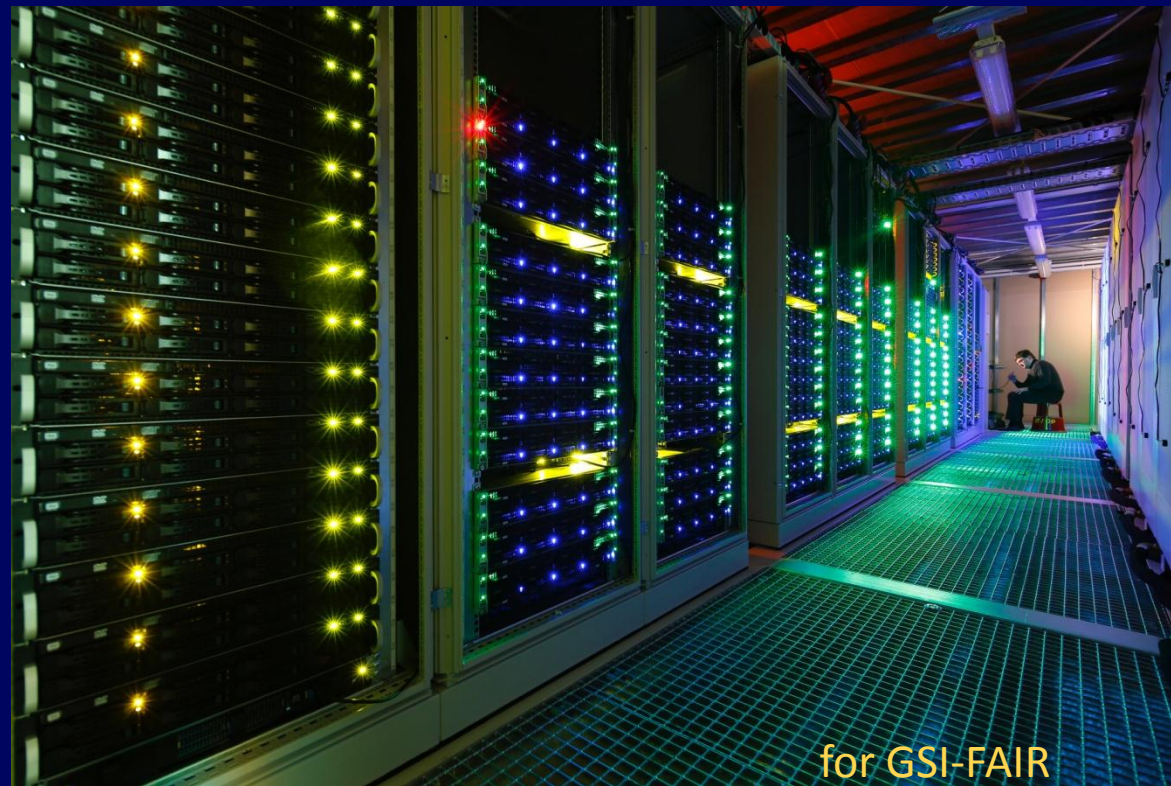
The next political step – Signature of the MoC at the EU-WB Summit on 17 May 2018, in Sofia

**MEMORANDUM OF COOPERATION
ESTABLISHMENT OF A SOUTH EAST EUROPEAN INTERNATIONAL INSTITUTE
FOR SUSTAINABLE TECHNOLOGIES**

Draft of the Memorandum to be prepared by the Intergovernmental Steering Committee

Fast reaction and help needed to get ready by the EU-WB Summit

This project would trigger a further economical development of the Region





Thank You for your attention