European Nuclear Science and Applications Research 2 (ENSAR2)

Muhsin N. Harakeh

Coordinator ENSAR2

on behalf of

ENSAR2 management group

NuPECC Town Meeting

11-13 January 2017

Darmstadt, Germany

ENSAR2 is the Horizon-2020 integrating activity for European nuclear scientists who are performing research in three of the major subfields defined by NuPECC: Nuclear Structure and Dynamics, Nuclear Astrophysics and Nuclear Physics Tools and Applications. It proposes an optimised ensemble of Networking, Joint Research and Transnational Access Activities, which will ensure qualitative and quantitative improvement of the access provided by the current ENSAR2 research infrastructures.

ENSAR2's core aim is to provide access to nine of the complementary world-class large-scale facilities: GANIL (F), GSI (D), joint LNL-LNS (I), JYFL (FI), KVI-CART (NL), CERN-ISOLDE (CH), ALTO (F), joint IFIN-HH/ELI-NP (RO) and NLC (PL). These facilities provide stable and radioactive ion beams of excellent qualities ranging in energies from tens of keV/u to a few GeV/u and intense photon beams up to 20-MeV energy. Furthermore, the infrastructure ECT* (I) will provide a unique place for meetings, seminars and workshops to the community.

ENSAR2 Started on:

March 1, 2016

We had the Kickoff Meeting in Caen

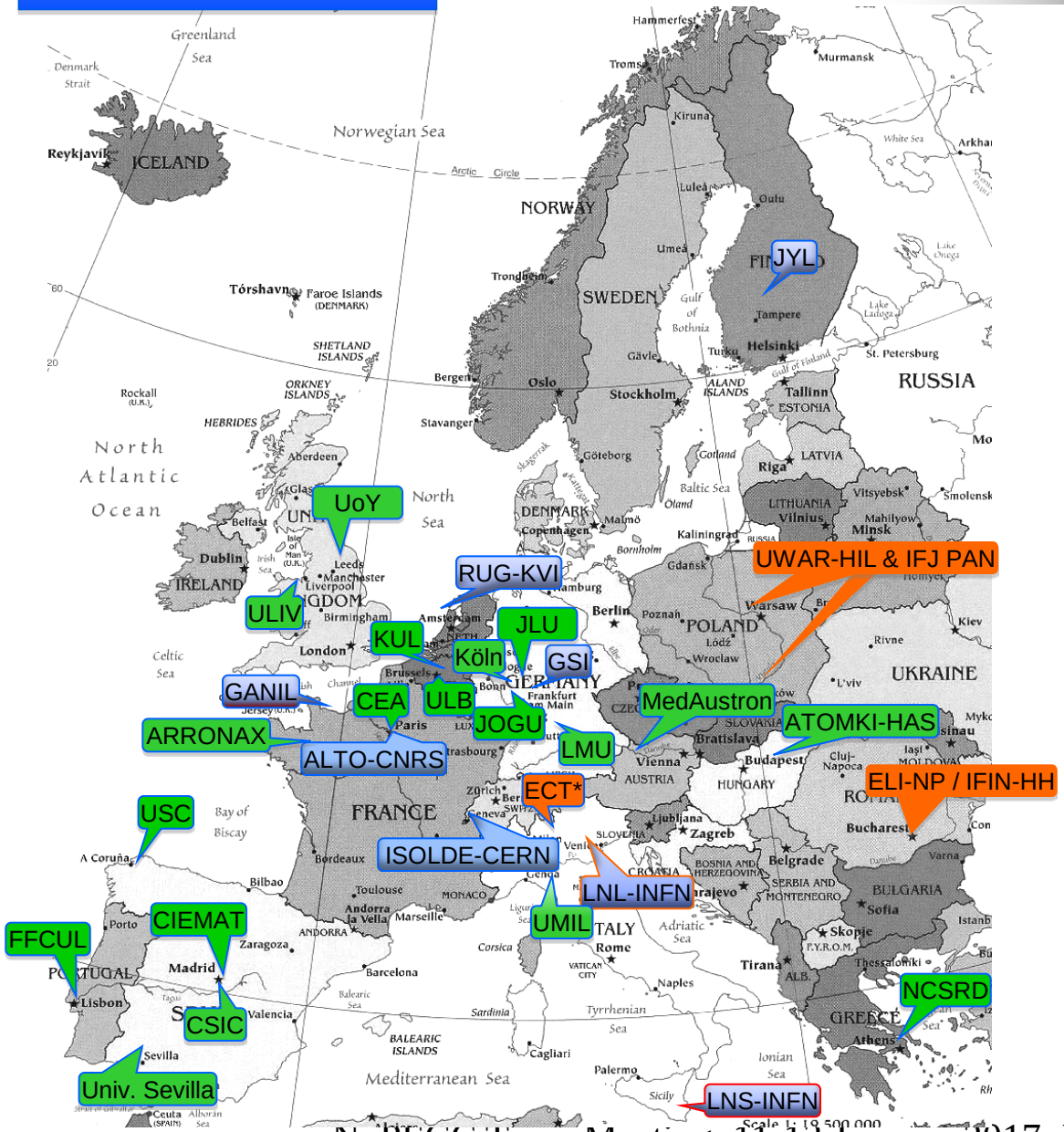
16-17 March 2016

End date on:

March 1, 2020

ENSAR2

Partners of ENSAR2



10 TNA Facilities

30 beneficiaries
15 countries

Community: 2700-3000 scientists and highly qualified engineers

Close collaboration with infrastructures outside Europe:
Canada: TRIUMF Vancouver
China: IMP Lanzhou
India: BARC Mumbai
VECC Calcutta
Japan: RIKEN Tokyo
RCNP Osaka
Russia: JINR Dubna
South Africa: iThemba Cape Town
United States: NSCL East Lansing
ANL Argonne

TNAs

- GANIL-SPIRAL2 (France)
- LNL-LNS (INFN, Italy)
- ISOLDE (CERN, Switzerland)
- JYFL (Finland)
- ALTO (CNRS, France)
- GSI (Germany)
- KVI-CART (The Netherlands)
- NEW NLC (HIL/IFJ PAN, Poland)
- NEW IFIN-HH/ELI-NP (Romania)
- NEW ECT* (Italy)

The Networking Activities (NAs) of ENSAR2 have been set-up with specific actions to strengthen the community's work in Transnational Access Activities and Joint Research Activities (JRAs). They promote foresight studies for new instrumentation and methods, stimulate complementarity, ensure a broad dissemination of results and stimulate multidisciplinary and application-oriented research and innovation at the Research Infrastructures. They aim to strengthen the community's coherence regarding particular research topics, to pool resources and to provide instruction courses to users.

NAs

- **NA1-FISCO2: FInancial and Scientific COordination 2**

  Ketel Turzó

Managing Network to insure a smooth running of the ENSAR2 IA in all aspects of technical, scientific, financial, administrative, contractual and legal activities. It will supervise an impact study on TNA infrastructures and on ENSAR2 itself. FISCO2 will also stimulate dissemination of knowledge and outreach activities.

- **NA2-NuSPRA(SEN): Nuclear Structure Physics, Reactions and Astrophysics (and Superheavy Elements Network)**

  Christoph Scheidenberger

Provides a forum to discuss the scientific interests of the nuclear structure and nuclear astrophysics communities (including EURISOL community), the progress in these subfields and the optimisation of the use of the large RIs for that purpose.

- **NA3-MIDAS: MInimisation of Destructive plASma processes in ECR ion sources**

  Hannu Koivisto

Supports developments of ion sources by academic and industrial (AVS and PANTECHNIK) experts and organises trainings and workshops on this topic for the community.

- **NA4-NUSPIN: Nuclear Spectroscopy Instrumentation**

  Silvia Lenzi

Aims at pooling and optimising the use of the valuable resources for high resolution gamma-ray spectroscopy and coordinating their use at the facilities. Instruction courses for young scientists and engineers to get them acquainted with these techniques are part of this activity.

- **NA5-MediNet (ASTARTE+ Ion-Beam Therapy)**

  Peter Thirolf & Giulio Magrin

Is devoted to nuclear physics for medicine through the developments of beam and detection techniques and of ion-beam therapy.

- **NA6-GDS: Gas-filled Detectors and Systems**

  Geoff Grinyer

Gathers experts of gas-filled detectors and systems (Active targets/TPC gaseous detectors) to develop new techniques to overcome constraints such as high-intensity beams and strong non-uniform magnetic fields.

- **NA7-ENSAF: European Network of Small-scale Accelerator Facilities**

  Sotirios Harissopulos

Is a network of small-scale accelerators to support technical developments and tests for experiments at large-scale infrastructures

- **NA8-NuPIA: Nuclear Physics Innovation**

  Marie-Hélène Moscatello

Is a transversal activity to support innovation through bridging between academic research and industry, impact study and training of industrial personnel in research institutions.

To enhance the access to the ENSAR2 facilities, the community has defined a number of Joint Research Activities (JRAs) using as main criterion scientific and technical promise. These activities deal with novel and innovative technologies to improve the operation of the ENSAR2 facilities and make the most efficient and effective use of them. They are in general relevant to more than one facility and rely on strong participation of the European university groups.

These activities involve all facets of operation of an accelerator facility.

JRAs

- **JRA1-PASPAG: Phoswich scintillator assemblies: Application to the Simultaneous detection of PArticle and Gamma radiation**

  Olof Tengblad

Studies detection of particles and gamma rays with phoswich scintillators allowing for simultaneous detection with same detector array. PASPAG will also develop applications of detection systems for homeland security.

- **JRA2-PSeGe: Position-Sensitive Germanium detectors for nuclear structure and applications**

  Andres Gadea

Is focused on 3-dimensional position-sensitive Ge detectors dedicated to nuclear structure and applications in imaging.

- **JRA3-TheoS: Theoretical Support for nuclear facilities in Europe - Nuclear Structure & Reactions**

  Denis Lacroix

Is a theory support activity to experiments in nuclear structure and reactions.

- **JRA4-RESIST: RESonance IoniSation Techniques for separators**

  Iain Moore

Develops resonance laser ionisation techniques for the production of high-purity beams of radioactive ions.

- **JR5-SATNuRSE: Simulations and Analysis Tools for Nuclear Reactions and Structure in Europe**

  Nasser Kalantar-Nayestanaki

Is devoted to simulations, developments of analysis tools and data management.

- **JR6-EURISOL facility (all stages)**

  Yorick Blumenfeld

Develops techniques and tools for current and future ISOL facilities, such as charge breeders, beam production and a dissemination tool to inform the community on available beams and intensities.

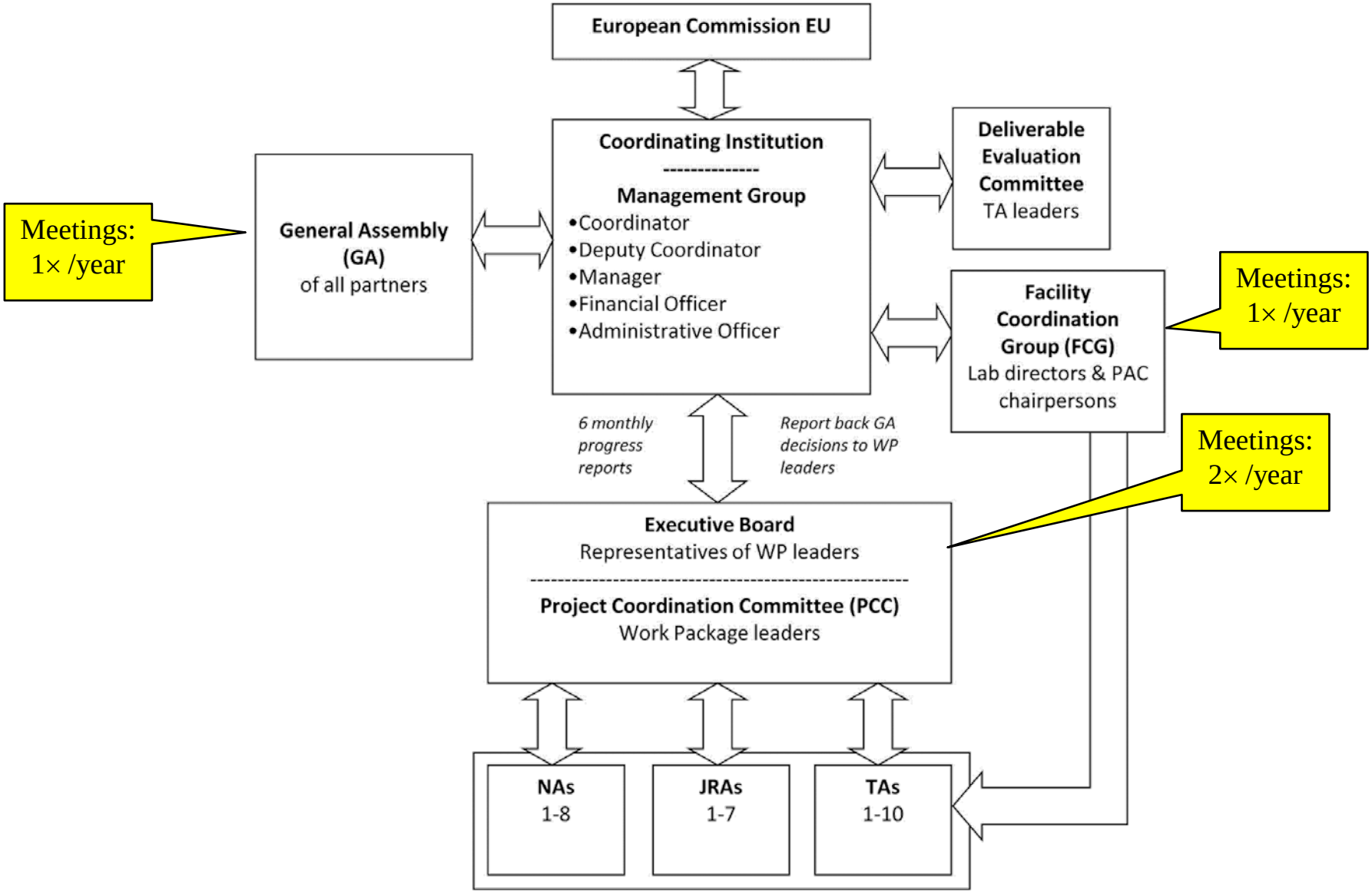
- **JR7-TecHIBA: Technologies for High Intensity Beams and Applications**

  Faiçal Azaiez

Aims at accelerator and instrumentation developments in the framework of high-intensity stable ion beams.

Includes a task on radio-isotopes for therapy and medical imaging

Organisation of ENSAR2



Management Group

Coordinator: Muhsin N. Harakeh

Deputy Coordinator: Marek Lewitowicz

Manager: Ketel Turzó

Financial Officer: Veronique Vandevoorde

Administrative Officer: Sandrine Dubromel

Impact Studies Coordinator: Sabrina Lecerf-Rossard

General Assembly

Chair: Adam Maj

Executive Board of PCC

TNAs: Maria G. Borge

Ari Jokinen

JRAs: Andres Gadea

Olof Tengblad

NAs: Silvia M. Lenzi

Christoph Scheidenberger

ENSAR2 Research Infrastructures (ENRI)

Cooperation and Coordination Agreement between GANIL, LNL/LNS (INFN), ISOLDE (CERN), JYFL (JYU), ALTO (CNRS), GSI, KVI-CART, NLC (IFJ PAN & UNIWARSAW), IFIN-HH/ELI-NP, ECT* (FBK) and ENSAF network

1. ***Accelerator facilities***
2. ***Experiments in nuclear (astro)physics***
3. ***Nuclear theory***
4. ***Expensive, technically advanced experimental equipment***
5. ***Coordination***

Facility Coordinating Group (FCG)

Directors, chairpersons of local PACs of the ENRI participating laboratories, a representative of ENSAF network and the coordinator of ENSAR2.

The mission of the overarching Facility Coordinating Group is to do the coordination and harmonisation between the ENSAR2 research infrastructures and also their PAC's and thus go a long way in the spirit of the 'Integrating activity' programme through integration of the transnational access.

Further aspects of the collaboration between the laboratories:

1. ***Accelerator physics***
2. ***Radiobiology, hadron therapy and other applications***
3. ***Educational programme***
   (e.g., European School on Exotic Beams)
4. ***International dimension***

International dimension

ENSAR2 will be able to provide transnational access to ENRI facilities to international users from outside the European Union and associated countries. This could be up to 20% of the total ENSAR2 quantity of access allocated to transnational access. The coordinator of ENSAR2 will contact directors of international large research infrastructures in Canada, China, India, Japan, Russia, South Africa, and USA to promote mutual collaboration on access to these international research infrastructures and ENRI facilities. The directors of the ENRI RIs with this ENRI agreement delegate the signature of the Memorandums of understanding (MoUs) between the international labs and ENSAR2 to the ENSAR2 coordinator. The MoUs would be signed by the various directors of the international labs and ENSAR2 coordinator in which the terms for access of European citizens to the international labs and vice versa will be recorded.

The ENRI agreement is valid through the contract period of ENSAR2 from 1 March 2016 to 1 March 2020.

ARTICLE 1
Purpose of the memorandum

The objective of this MoU is to establish a general framework of collaboration and project relationship, implemented by RNC-RIKEN and IA ENSAR2 to increase cooperation between the Parties in general and to provide a framework for establishing specific collaborative activities between the parties. The collaboration aims:

- **to provide access to the facilities at RNC-RIKEN for European physicists and vice versa to the facilities of IA ENSAR2 RIs to Japanese physicists following the rules of the various infrastructures, i.e. approved projects based on scientific merits and feasibility, and**
- **to increase cooperation and mutual support between the Parties in general.**

APPENDIX I

Each Party shall be responsible for its own costs and expenses under this MoU, except as otherwise agreed in writing by the Parties. RNC-RIKEN will cover the daily expenses of European physicists, while performing experiments at RNC-RIKEN, according to local per diem rules and vice versa, IA ENSAR2 will cover the daily expenses of Japanese physicists, while performing experiments at IA ENSAR2 RIs, according to local per diem rules of the IA ENSAR2 RIs. In the case of IA ENSAR2 support, mutual spokesmanship for the experiments is required.

- **Milestones up to January 1, 2017 have all been met.**

- **Kick-off meetings for all NAs and JRAs have taken place and some workshops have been organised.**

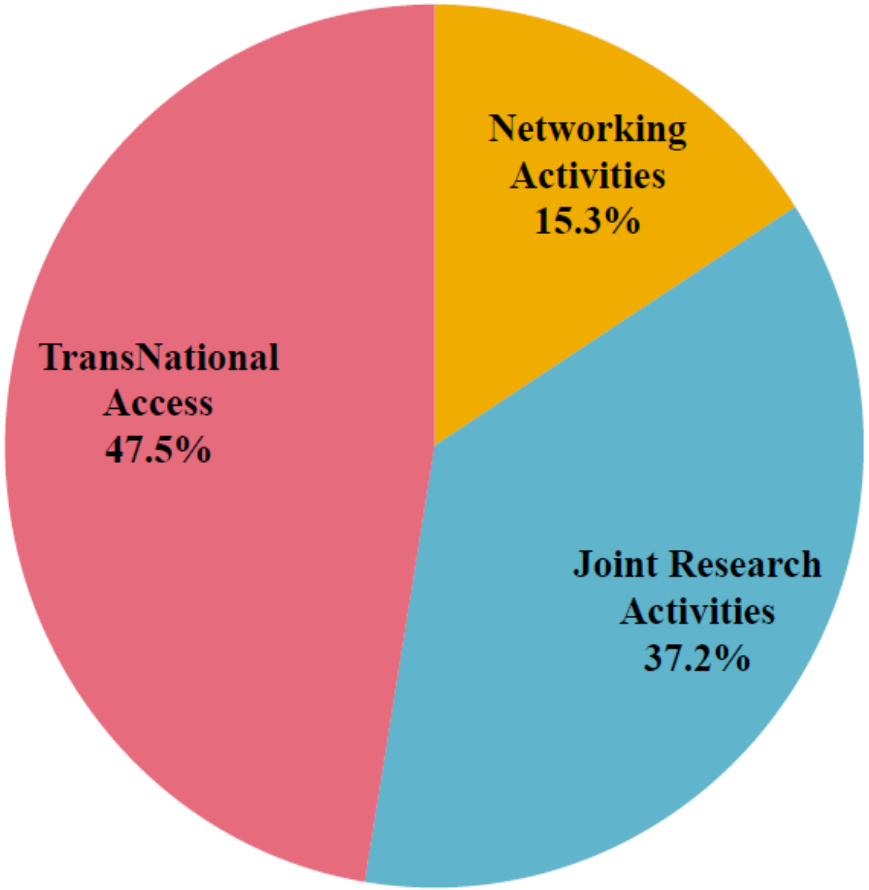
- **ENSAR2 research infrastructures have already allocated beam time with ENSAR2 support.**
  - **ALTO, LNL and LNS**
  - **GANIL, GSI**
  - **ISOLDE, JYU, KVI**
  - **IFJ PAN, HIL, IFIN-HH**
  - **ECT* supported workshops**

BUDGET

Total budget for ENSAR2: 10 000 000 €
to share between 30 beneficiaries

Pre-financing: 3 250 000 €

Next funding: after validation of each periodic report



Thank you for your attention

BUDGET

Total budget for ENSAR2: 10 000 000 €
to share between 30 beneficiaries

Pre-financing: 3 250 000 €

Next funding: after validation of each periodic report