

NuPECC and implementation of the 2017 Long Range Plan

Marek Lewitowicz
NuPECC & GANIL

- **What is NuPECC?**
- **Current and future NuPECC activities**
- **Implementation of the 2017 Long Range Plan in Nuclear Physics**

What is NuPECC ?

**The European Expert Board
for Nuclear Physics
hosted by European Science
Foundation
*Almost 30 years old***

Representing
about 6000 scientists

Members: 31 representatives
from 20 countries + JINR Dubna
5 observers

3 regular Committee meetings per year



The objective of NuPECC is to:

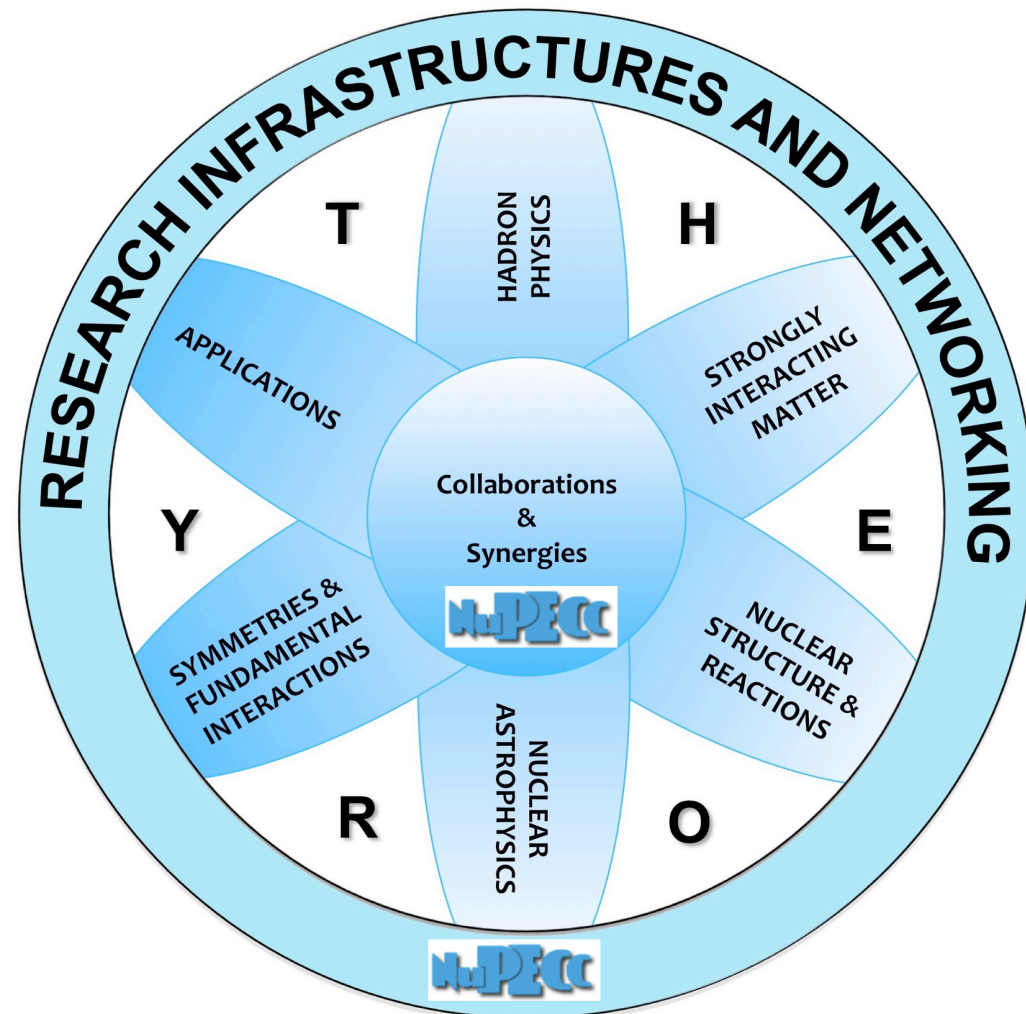
- develop the strategy for European Collaboration in nuclear science by supporting collaborative ventures between research groups within Europe

-> Long Range Plan



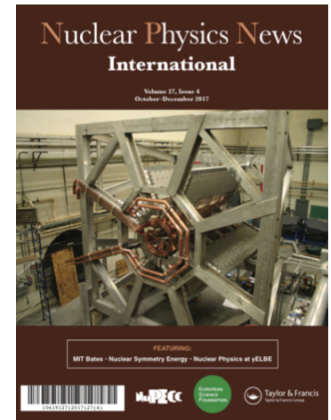
- promote nuclear physics and its trans-disciplinary use in applications for societal benefit.

NuPECC ToR



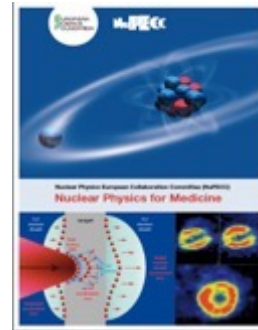
- **Nuclear Physics News International**

- Strong and internationally recognized point of the NuPECC activities



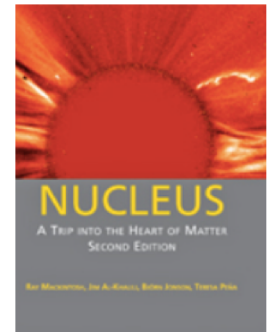
- **NuPECC Special Reports**

- Nuclear Physics for Medicine (2014)
- Light to Reveal the Heart of Matter (2015)



- **Public Awareness in Nuclear Physics (PANS)**

<http://www.nupecc.org/pans/index.html>



- **Nuclear Physics Experience (NuPEX) :** <http://nupecc.eu>

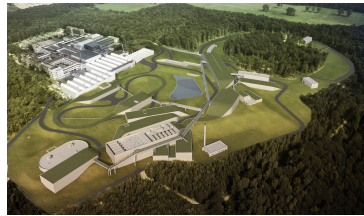


- **New NuPECC members**
 - ELI-NP, Ireland, Slovakia, Bulgaria, Baltic countries, ...
- **Strong collaboration with NPB of EPS**
- **Regular update on the activities of sister organisations: IUPAP (C12 &WG9), NSAC, ANPhA, ALAFNA**
- **Regular update on the evolution of Nuclear Physics in the NuPECC member states**
- **Update of the NuPECC Terms of Reference**
 - New associated members (candidates: iThemba, Nishina Centre at RIKEN,...)
 - Modifications related to the new structure of ESF

NuPECC and implementation of the 2017 Long Range Plan of NuPECC

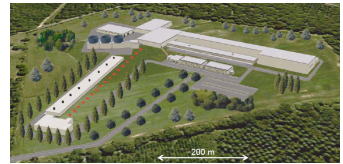
Marek Lewitowicz
NuPECC & GANIL

- What is NuPECC?
- Current and future NuPECC activities
- **Implementation of the 2017 Long Range Plan in Nuclear Physics**



Complete urgently the construction of the ESFRI flagship FAIR and develop and bring into operation the experimental programme of its four scientific pillars APPA, CBM, NUSTAR and PANDA.

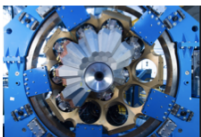
Support for construction, augmentation and exploitation of world leading ISOL facilities in Europe towards EURISOL.



Support for the full exploitation of existing and emerging facilities

**ELI-NP
NICA, SHEF**

Support for ALICE and the heavy-ion programme at the LHC with the planned experimental upgrades.

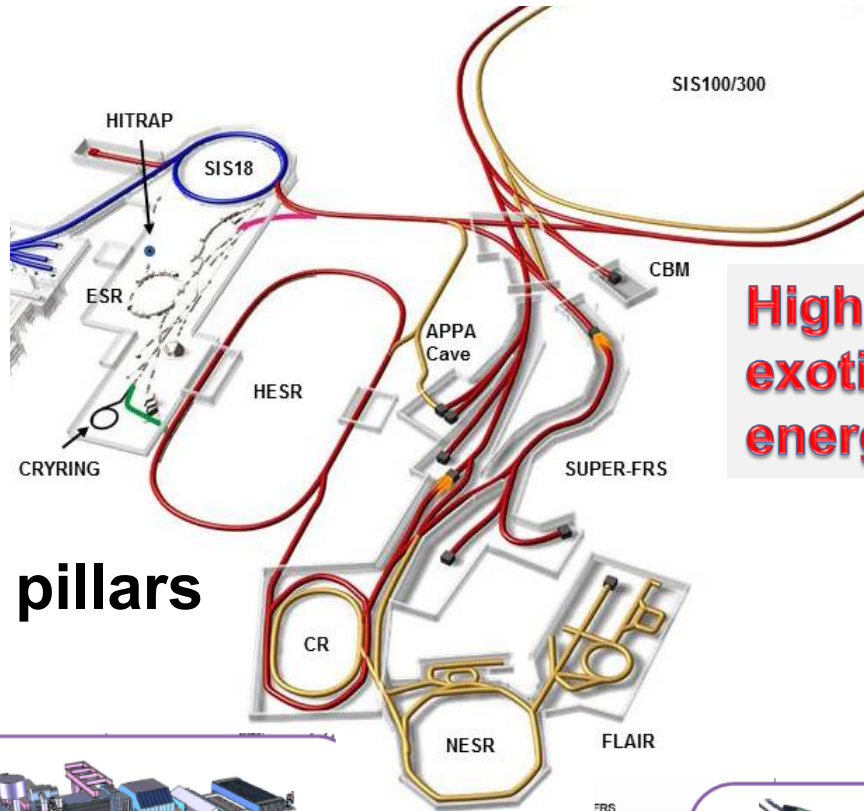


Support to the completion of AGATA in full geometry.

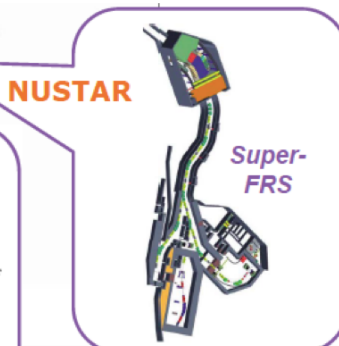
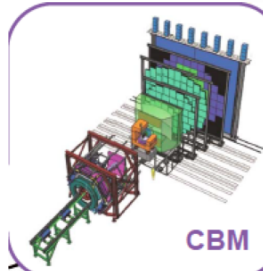
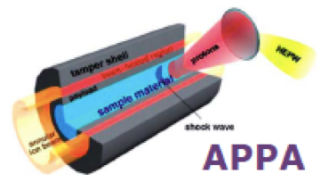
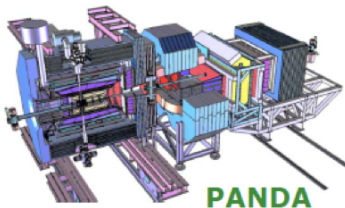
- **Nuclear Physics infrastructures on the ESFRI roadmap**
 - **ESFRI 2016 roadmap**
 - Landmark infrastructures: FAIR and SPIRAL2
 - On the roadmap: ELI-NP and MYRRHA
 - Intern. projects complementary to ESFRI projects: NICA
 - *New project(s) for the 2020 update: EURISOL-DF,...*
- **EU funded Integrating Projects**
 - Today ongoing ENSAR2 (MoU signed with JINR)
 - *Hadron Physics Horizon – follow-up of the preparation of the new proposal & lobbying – call published by the European Commission in October 2017, dead-line March 22nd, 2018*
 - *Nuclear Physics in EU FP9 – lobbying EC, ESFRI*

Large facility covering all nuclear physics domains !

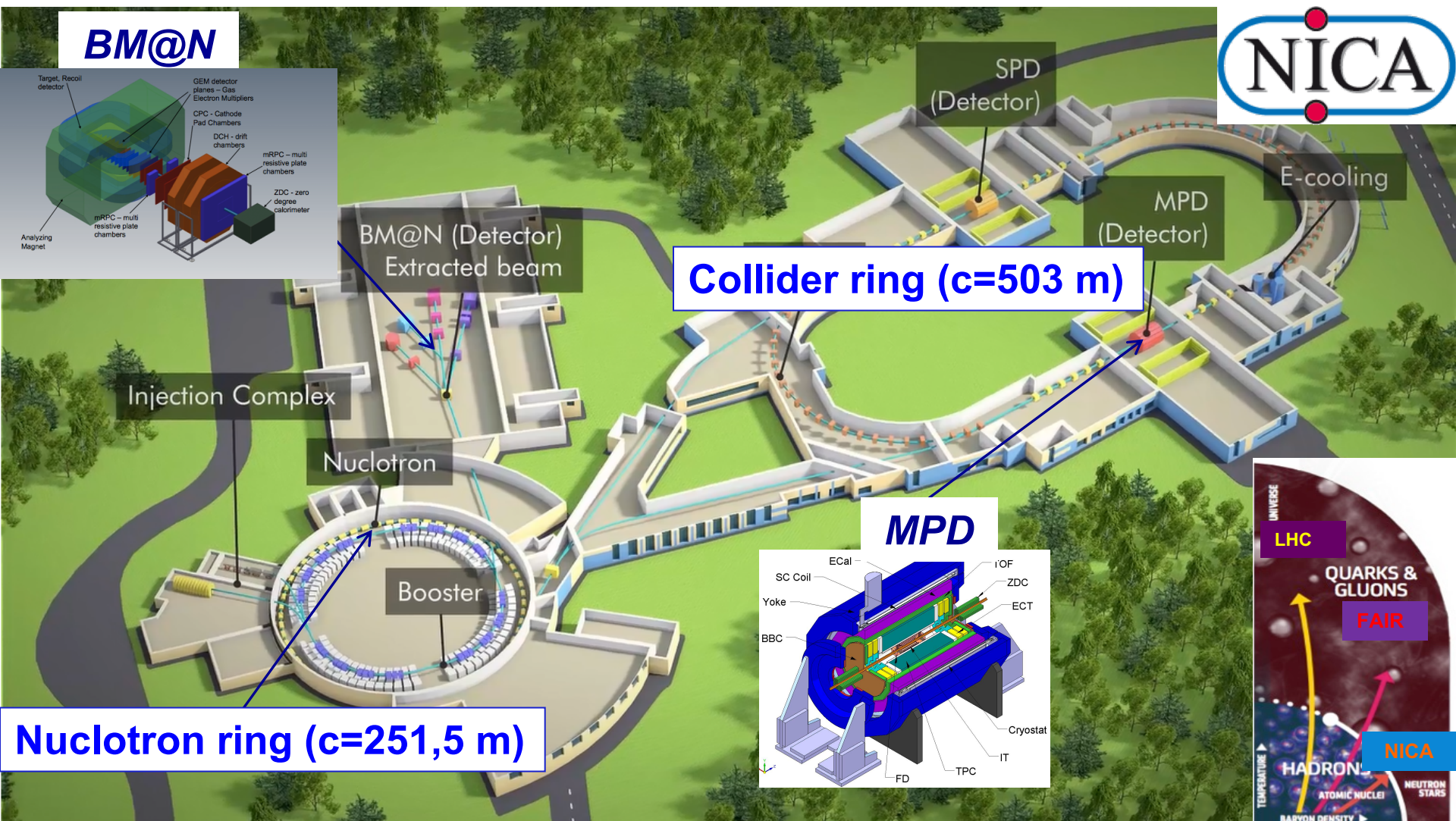
Highly charged ions (e.g. U^{92+}) and exotic Nuclei) from rest to relativistic energies 4.9 GeV/A



4 pillars



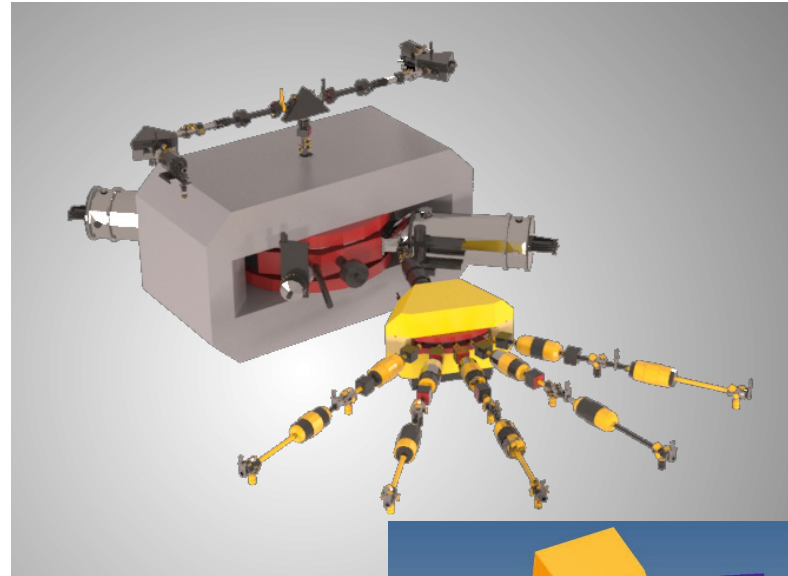
Worldwide Unique



Fully develop synergies between NICA, FAIR and ALICE



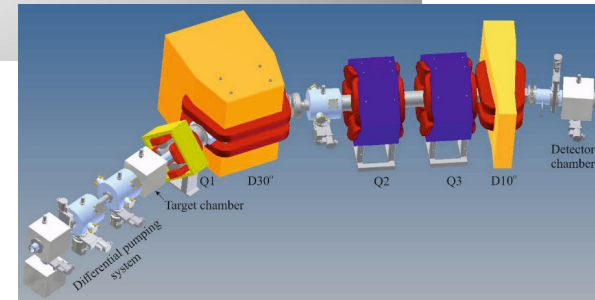
SHE Factory Building



High-current cyclotron DC-280

New facilities:

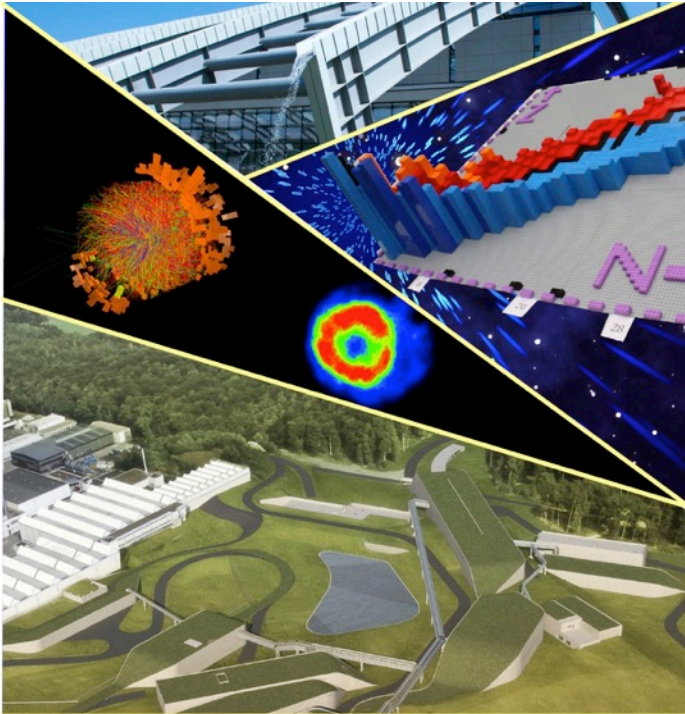
- New gas-filled separator
- Pre-separator for chemistry experiments
- SHELS
- Etc.



- Reinforce synergies between SHE Factory, GSI, SPIRAL2 and JYFL
- Open FLNR accelerators for a large European nuclear physics community

Support for construction, augmentation and exploitation of world leading ISOL facilities in Europe.

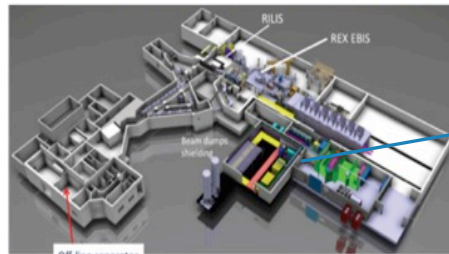
The urgent completion of the ESFRI facility SPIRAL2 along with SPES and the energy and intensity upgrade of HIE-ISOLDE (+ storage ring), including their unique instrumentation will consolidate the leading role of Europe. These ISOL facilities with low energy and reaccelerated exotic beams, offer extraordinary opportunities for scientific discoveries to probe questions that concern the atomic nucleus and nuclei in the cosmos. The successful completion and exploitation of these facilities would be the major step toward the ultimate European ISOL facility, EURISOL. With this aim, a strong European collaborative initiative, the EURISOL-Distributed Facility, is strongly supported to maximize synergies to address and solve new scientific and technical challenges.



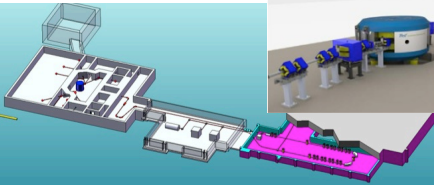
An effort to perform a coordinated program with existing and planned radioactive beams produced with the ISOL technique and to do R&D for the next step EURISOL

Focus is on
nuclear structure,
nuclear
astrophysics and
applications

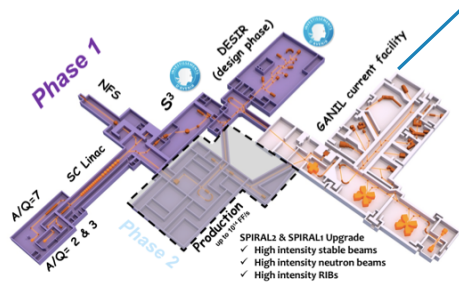
ISOLDE-CERN



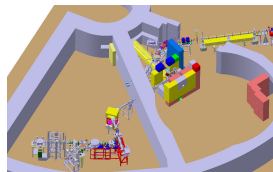
SPES at LNL



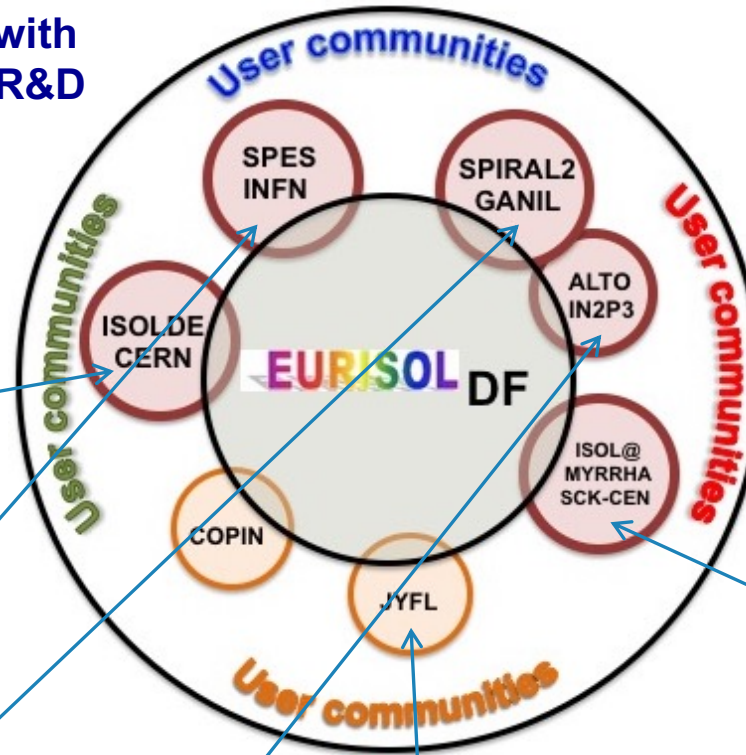
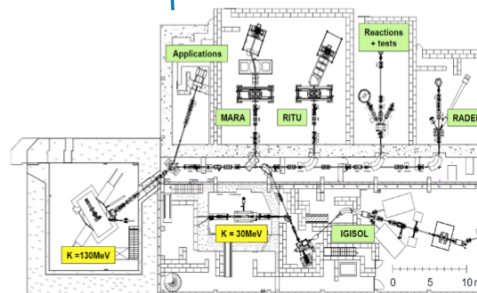
GANIL/SPIRAL2



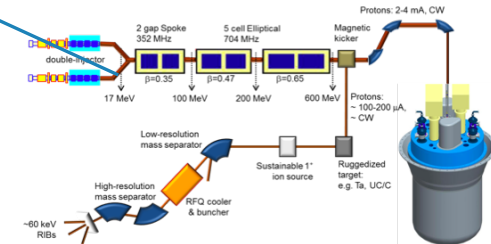
ALTO



JYFL



ISOL@MYRRHA



Goal:
EURISOL-DF on the ESFRI Roadmap in 2020

- Nuclear Physics infrastructures on the ESFRI roadmap
 - ESFRI 2016 roadmap
 - Landmark infrastructures: FAIR and SPIRAL2
 - On the roadmap: ELI-NP and MYRRHA
 - Intern. projects complementary to ESFRI projects: NICA
 - *New project(s) for the 2020 update: EURISOL-DF,...*

- **EU funded Integrating Projects**
 - Today ongoing ENSAR2 (MoU signed with JINR)
 - *Hadron Physics Horizon – follow-up of the preparation of the new proposal & lobbying – call published by the European Commission in October 2017, dead-line March 22nd, 2018*
 - *Nuclear Physics in EU FP9 – lobbying EC, ESFRI*



Nuclear structure reactions and applications *Contract 2016-2020*

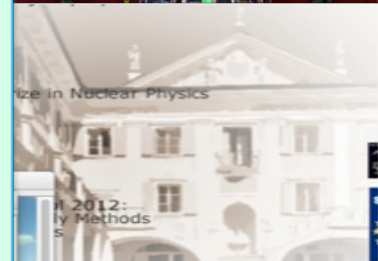
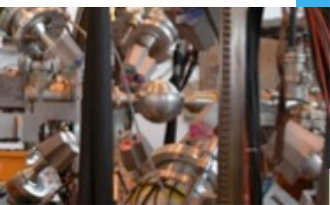
- GANIL (France)
- LNL-LNS (Italy)
- ISOLDE (CERN)
- JYFL (Finland)
- ALTO (CNRS, France)
- GSI (Germany)
- KVI (The Netherlands)
- NLC (HIL/IFJ PAN, Poland)
- IFIN-HH/ELI-NP (Romania)
- ECT* (Italy)



Hadron physics with hadronic and electromagnetic probes

Proposal by March 2018

- CERN (LHC, COMPASS, fixed target)
- GSI/FAIR (Germany)
- LNF, Frascati (Italy)
- MAMI, Mainz (Germany)
- ECT*, Trento (Italy)
- ELSA, Bonn (Germany)
- COSY, Julich (Germany)



- **Goal**

- promote and lobby for the application of the LRP recommendations in the European countries

- **Composition**

- NuPECC representatives of the ESFRI facilities under construction, namely of ELI-NP, FAIR/GSI, GANIL/SPIRAL2, JINR/NICA&SHEF and NuPECC Chair, Deputy Chair (if appointed) and NuPECC Scientific Secretary

- **Modus Operandi**

- meetings with major European organizations (EC, ESFRI, CERN, JINR, ...) and national ministries/funding agencies involved in the decision-making process and funding of the research in nuclear physics in Europe
- The meetings will be organised starting from March 2018

• Presentations

- LRP official presentation: event in Brussels November 27, 2017
- 2017/2018 by A. Bracco and M. L.: CERN, IUPAP WG9, ECFA, IN2P3 Directorate, CEA/Irfu directorate, Poland/HIL, SC JINR, ...

Meeting in Brussels



• Articles

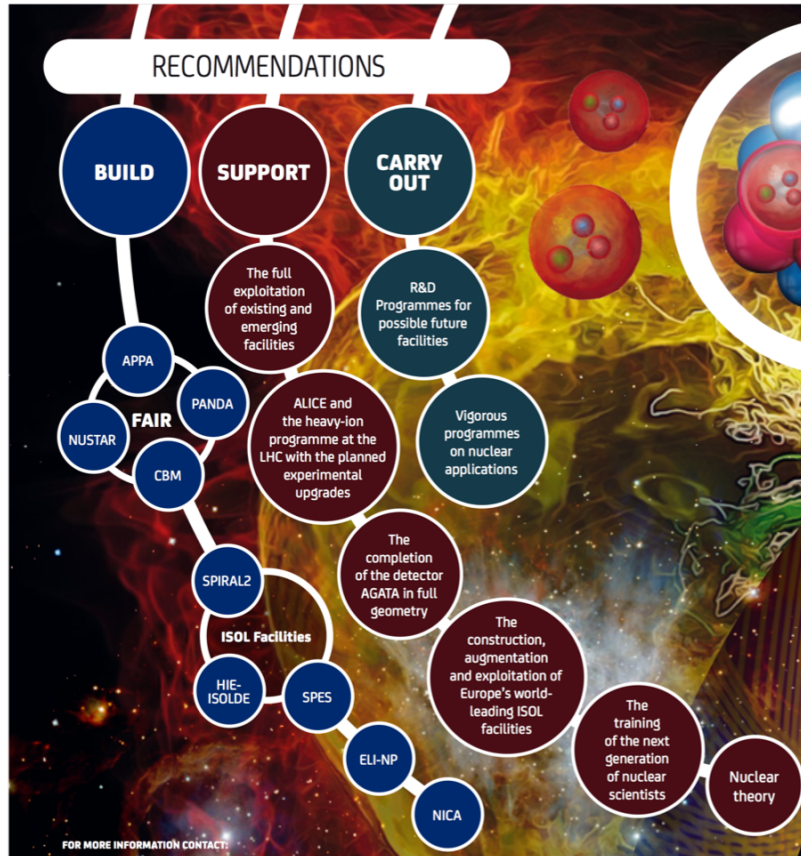
- CERN Courier, Physics World, Nucl. Phys. News, Europhysics News, ...

• Press releases

- IN2P3, CEA, INFN, ...



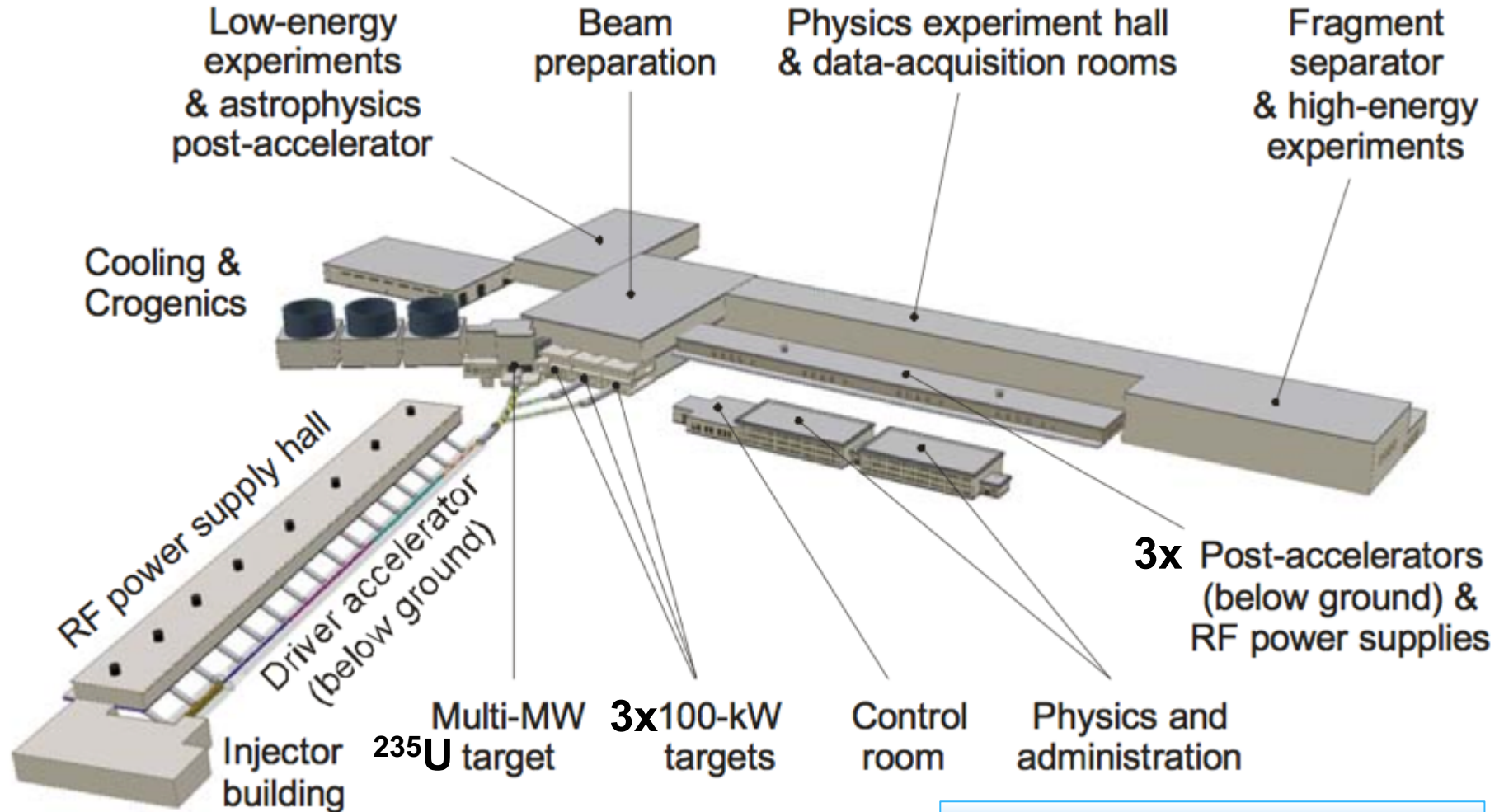
European Nuclear Physics: Ambitious goals, bright future



- The 2017 NuPECC Long Range Plan defines an ambitious strategy for European Nuclear Physics
- In particular, the LRP highlights the importance of the NICA and SHE Factory projects for the European Roadmap
- JINR being a member of NuPECC, have actively participated in the elaboration of LRP and will be one of the major driving force in its implementation phase
- The implementation of the LRP proposed by NuPECC on the European and International levels should tighten the links between JINR and the whole nuclear physics community in Europe

THANK YOU FOR YOUR ATTENTION

Up to 150 AMeV for ^{132}Sn



LINAC: H, D, He and $A/q=2$ ions up to 1 A GeV

Multi-user capabilities

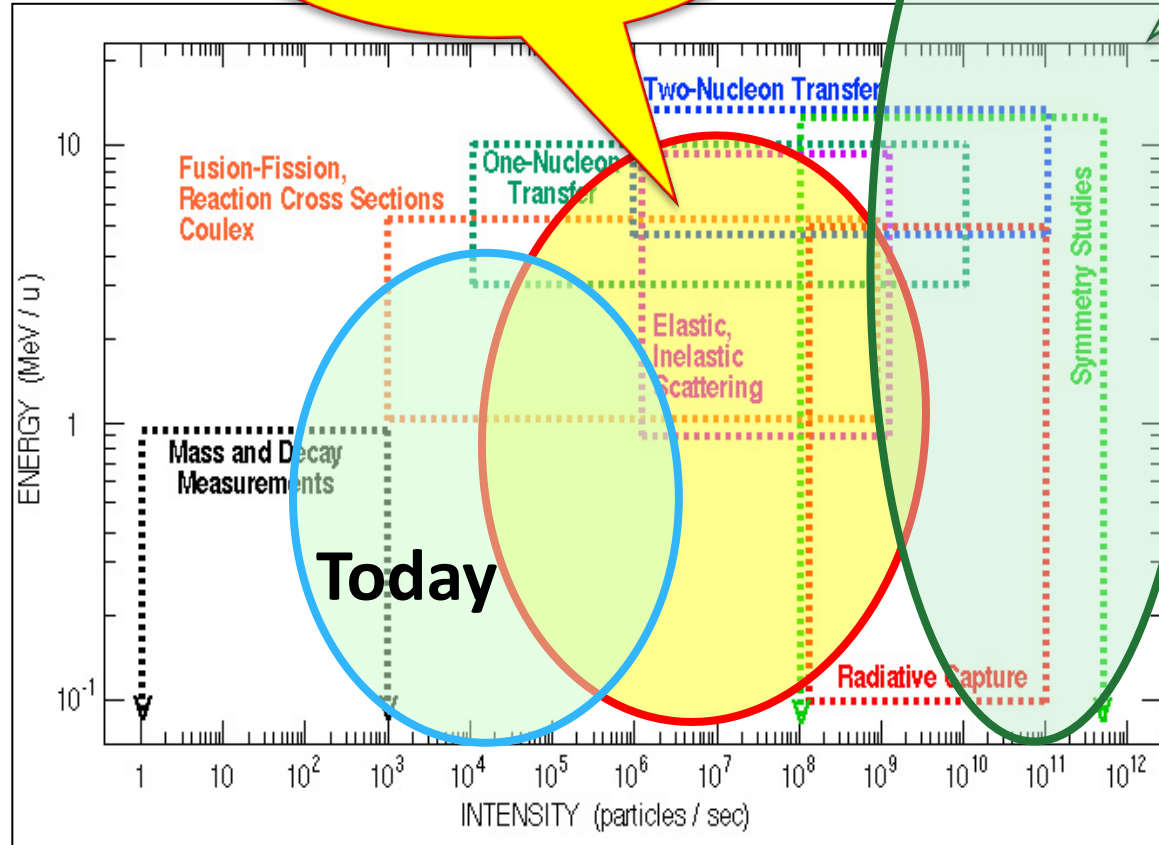
Cost: > 1.3B€

Physics with ISOL RIB Intensity & Energy domains

Precision nuclear structure physics & applications

HIE-ISOLDE, SPES,
SPIRAL2-ALTO
ISOL@MYRRHA
EURISOL-DF

EURISOL



Second generation

EURISOL

-> EURISOL-DF (Distributed Facility) Initiative from 2014 as an intermediate step towards EURISOL