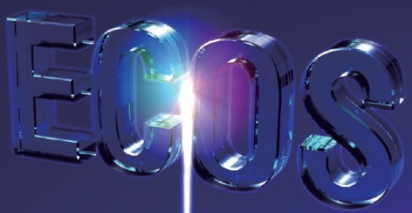




The objectives of ECOS initiative (see nuPECC web pages)

--Bring together and coordinate the expertise that is available in the European countries in order to achieve the research and developments activities needed in all aspects related to the production and use of high intensity heavy ion beams.

--Optimize resources and manpower for the up-grade and development of various stable ions beam facilities in Europe in order to increase their scientific output. From this point of view, NA02-ECOS has a direct link to the TNA delivering stable ion beams to the users community in Europe.



ECOS-NA



6 Beneficiaries

GANIL (France)

IN2P3 (France)
GSI-Darmstadt (Germany)

INFN (Italy)

University of Jyväskylä (Finland)

IFJ PAN Krakow - HIL UW Warsaw (Poland)

30 associate partners

NIPNE-Bucarest (Roumania)

IN2P3 (France)

Department of Physics, University of Liverpool (UK)

KVI –Groningen (Netherlands)

CEA-Saclay (France)

LMU Munich (Germany)

IRMM Geel, (Belgium)

University of Sofia (Bulgaria)

Paul Scherrer Institute (Switzerland)

Royal Institute of Technology - Stockholm (Sweden)

University of Surrey (UK)

University of Paisley (UK)

University of Mainz (Germany)

Comenius University, Bratislava (Slovakia)

Nigde University (Turkey)

NCSR Demokritos (Greece)

Atomki- Bebrece (Hungary)

HIL UW warsaw (Poland)

SAFE –University of Oslo (Norway)

CEA-Bruyeres-le –Chatel (France)

TU Munich (Germany)

INRNE-BAS, Sofia (Bulgaria)

Lund University (Sweden)

University of Bern (Switzerland)

University of Manchester (UK)

University of York (UK)

STFC Daresbury (UK)

University of Aarhus (Denmark)

Istanbul University (Turkey)

NR-Dubna (Russia)



Steering committee

F. Azaiez (IN2P3)

D. Ackermann (GSI)

G. DeAngelis (LNL)

M. Lewitowicz (GANIL)

A. Maj (Krakow-Warsaw)

R. Julin (JYFL)



Task 1 High power thin-target technology

The maximum usable primary beam current with thin targets is among others determined by the long-term stability of the thin targets under irradiation. High beam intensities lead to a considerable heating of the targets, and, hence to thermal stress, possibly phase transitions, oxidation or reduction of the chemical compounds and diffusion into the target backing respectively.

We propose to study these phenomena in detail and to compare for example the performance of thin actinide targets as function of the production method (painting, spray-painting, electrolysis, electro-deposition, evaporation and sputtering), the used chemical compounds (oxide, carbide, others) and backings/coatings respectively. The way is to bring together labs that use different techniques for target preparation and those that can test the target performance under “real” conditions.

For this task ECOS will have the duty to organize the collaboration and exchange of expertise on the development of high power target technology

Task 2 Synergies in Super Heavy Element Research

The study of Super Heavy Elements (SHE) is one of today’s most challenging interdisciplinary research fields. It brings together nuclear physics, atomic physics, chemistry and theoretical physics. Over the last years researchers from the different disciplines have continued to strengthen exchange of ideas. The ECOS community proposes to use this Network in order to enhance synergies among the research groups on a European scale.

For this task ECOS is aiming for bringing together the groups with research activities on SHE using high intensity ion beams for an exchange of new ideas and techniques related to the use of very high intensity stable beams.

Task 3 Organisation of bi-annual ECOS Workshops

In order to optimize resources, two workshops will be organised with parallel sessions dedicated to all aspects of the technical developments and research activities using stable ions beam facilities in Europe. The second workshop will be coupled to the NA town meeting

Task 4 Coordination of stables Ion beam facilities in Europe

This third task is aiming for coordination and organization of the network.

Deliverables

D-NA02-1: Report on the development of high power thin-target technology with special emphasis on new techniques and methods that will allow increasing the primary beam intensity usable with such targets. (month 40)

D-NA02-2: Report on the research activities related to SHE 's ,and on the achievement made in this research field (month 40)

D-NA02-3: Report on the collaborations and synergies between facilities providing stable Ions beam facilities in Europe initiated and driven by ECOS network (month 40)

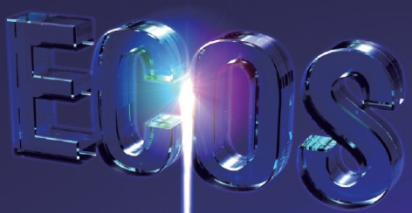
Milestone number	Milestone name	Work package (s) involved	Expected date
M-NA02-1	1 st ECOS joint workshop and coordination committee meeting	NA02	24
M-NA02-2	2 nd ECOS joint workshop, coordination committee meeting and town meeting	NA02	44
M-NA02-5	Network setup	NA02	12
M-NA02-5	Webpage available	NA02	12



Budget:

Work package number	NA02	Start date or starting event			1		
Work package title	ECOS (European Collaboration On Stable ion beams)						
Activity Type	NA						
Participant number							
Participant short name	IN2P3	GSI	INFN	JYFL	GANIL	I F J P A N - Krakow	HIL UW - Warsaw
Person-months per participant:	1	2	1	1	2	1	1
Travel costs (k€):	14	4	14	14	14	7	7
Other costs (k€):	14	20	0	0	0	0	0
Total costs (k€):	28	24	14	14	14	7	7
	Sum TOTAL COSTS work package NA02 = 108 k€						





ECOS ACTIVITIES



5 meetings of the ESC
2 workshops
1 facilities meeting

Erbismühle - Weilrod, Germany - May 13th - 16th, 2012

FUSHE2012

ENSAR-ECOS Workshop on Future Super-Heavy Element Strategy

EXPERIMENT
THEORY
INSTRUMENTATION

INTERNATIONAL ADVISORY COMMITTEE

M. Bender (CENBG)
J.P. Delaroche (DAM-CEA)
A. Drouart (IRFU-CEA)
J. Dudek (IPHC)
K. Eberhard (U. Mainz)
H. Haba (RIKEN)
P.H. Heenen (U. Brussels)
R.-D. Herzberg (U. Liverpool)
F.P. Heßberger (GSI)
T. Khoo (ANL)
H. Koura (JAEA)
M. Leino (U. Jyväskylä)
K. Morita (RIKEN)
W. Nazarewicz (U. Knoxville)
V. Pershina (GSI)
H. Savajols (GANIL)
A. Sobczewski (U. Warsaw)
Ch. Theisen (IRFU)
A. Türler (PSI/U. Bern)
J. Uusitalo (U. Jyväskylä)
A. Wieloch (U. Cracow)
A. Yakushev (GSI)
V. Zagrebaev (JINR-FLNR)

FUSHE2012 will be a working meeting to discuss
and develop the (near and far) future for the field
of Super-Heavy Elements.

ORGANIZING COMMITTEE

D. Ackermann (chair – GSI)
D. Boilley (co-chair – GANIL)
C. Stodel (scientific secretary – GANIL)
B. Avez (CENBG)
M. Block (GSI)
P. Greenlees (JYFL)
K. Hauschild (CSNSM)
D. Jacquet (IPNO)
K. Jadambaa (GSI)
E. Litvinova (GSI)
R. Lozeva (IPHC)
B. Sulignano (IRFU-CEA)

CONTACT: fushe2012@ganil.fr WEB: <http://www.ensarfp7.eu/workshops/fushe2012/>

Topical discussion for the subjects:

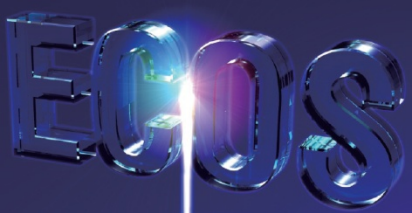
- SHE Synthesis
- Nuclear Structure of SHE
- Chemistry
- Atomic Physics and Alternative Approaches

- Experiment
- Theory
- Instrumentation

Goal:

Preparation of Deliverables 1 and 2





ECOS 2012

*Advances and challenges in nuclear physics with
high intensity stable beams*

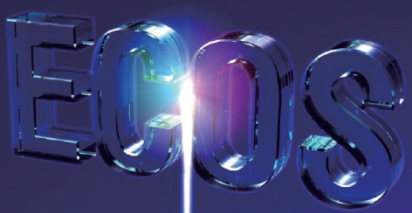
June 18th - 21st, 2012

Villa Vigoni, Lovenno di Menaggio (CO), Italy.

Goal:

**Synergies between stable ion beams in Europe
Update of the ECOS pages on the NuPECC web site.**

Préparation of Deliverable 3



Synergies between SIB facilities



Dubna
Unilac-GSI
Ganil

LNL
LNS
IPNO
JYFL

Warsaw
Krakow
Bucarest
Democritos

Work started at the Villa Vigoni ws!



Identified actions for enhancing synergies

- Interactive map of beams in Europe.**
- Creation of a 4-pages leaflet (stable Ion facilities in Europe)**
- Regular (every second year) : SIB facilities meeting**
- Internet Forum : for technical issues...**



Synergies on Accelerator technologies

Germany

Italy

France

....

TIARA



Future plans

-A town meeting in ORSAY

- *discussion of draft s documents of the 3 deliverables**
- *discussion of the revision of the ECOS report and recommendations**
- *discussion of the strategy of ECOS-JRA for ENSAR2**
- *finalize the interactive map of beams in Europe.**
- *Finalize the 4-pages leaflet of ECOS**
- *Update ECOS/NuPECC document**



Highlight: ECOS project LRF –UELVA

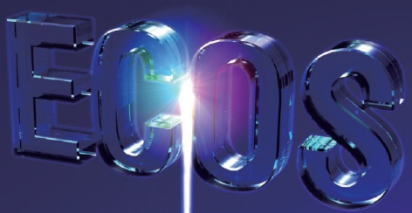


Universidad
de Huelva

Proposal for a first class ECOS facility in Andalucía

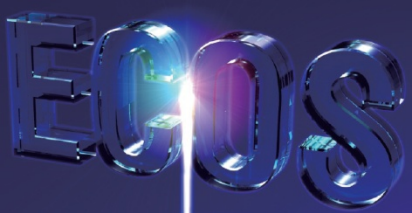
I. Martel and A.C.C. Villari
DFA-UHU, Spain

ECOS meeting - Orsay, the 16th of May 2013



The proposed High-Intensity accelerator: main parameters

- Protons to Uranium: 1 mA max intensity
 $^{48}\text{Ca} (8+) = 10 \text{ p}\mu\text{A}$
- Full-SC ECR ion source 14.5-18 GHz
- RFQ for $1 \leq A/q \leq 7$
- SC-LINAC
- Energies reachable with 3 or 4 Cryo-modules: see next 2 slides
- 7000 hours of availability, with 5000 hours for **ECOS science** and 2000 hours for Industry



The solution

- **Take advantage of best performance proven technologies**
- Short RFQ ($< 5\text{m}$)
- Short LINAC ($< 20\text{m}$) total length with 4 Cryo-modules and 26 resonators
- Evolutive solution: Possible first phase with 3 Cryo-modules and 19 resonators