

ECOS for ENSAR

Some of the key questions in the nuclear structure field are and will remain for the coming 10 years well addressed using high intensity stable ion beams!

Two important arguments

- i) Using stable beams facilities and new generation of detection techniques, the low energy nuclear physics community has proven to be impressively productive with new results and future perspectives!

- ii) Some of the key questions in the nuclear structure field are and will remain for the coming 10 years well addressed using the state of the art detection systems and higher intensity stable beams!

ECOS: European COllaboration for Stable (ion beams)

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Task: Produce a document to NUPECC

**-Study the up-grade of existing or new accelerators
to mach the physics requirements**

-Physics
-Collaboration
-Physics requirements (accelerator,target,instruments)



ECOS: European COllaboration on Stable ion beams

--The Science with high intensity stable ion beams, Beam intensity limitations and technical developments for various types of research lines!

N=Z nuclei (in-beam spectroscopy and decay studies)

SHE search

Super heavy nuclei (in-beam spectroscopy and decay studies)

Neutron-deficient nuclei (in-beam spectroscopy and decay studies)

Nuclear astrophysics

--Status and future developments of existing facilities

LEGNARO

GANIL

GSI

JYVASKYLA

--Recommendations

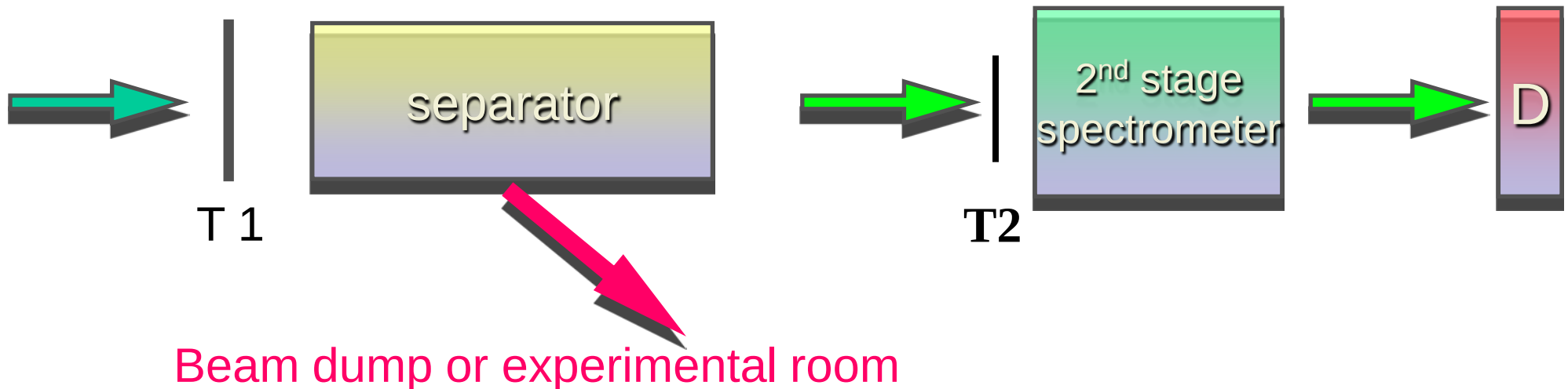
Off-beam spectroscopy - Decay studies: up to few 100pμA
(target technology and spectrometer with appropriate rejection power).
Cross section down to 1pb will be reachable!

In-beam γ and e^- spectroscopy :up to few 100pnA
(highly segmented detectors, digital electronics,time stamping)
Cross section below 100pb will be reachable!

Secondary reactions at the focal plan :

With very high beam intensity and inverse kinematics,
Coulomb excitation of recoils at the focal plan of the separator will be possible

With a $p\mu A$ primary beam the Coulomb excitation of superheavy nuclei or $N=Z$ nuclei
produced with cross section down to the μb becomes feasible



the ECOS
'Network within ENSAR'

The objectives of ECOS:

--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 optimize 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.

Synergies between SIB facilities

Dubna

Unilac-GSI

Ganil

LNL

LNS

JYFL

Warsaw

Krakow

Bucarest

Democritos

-Interactive map of beams in Europe.

-Technical Forum



‘ECOS facilities’: UNILAC, LINAG

**‘ECOS Projects’: cw-LINAC (GSI) ,SHE Factory (Dubna)
LINCE- Huelva**

Need for a strategy/ future task



Future:

- Techiba :ECOS-JRA proposal for ENSAR2

- Accelerator R&D: High power accelerator subsystems**
- Novel focal plan detection systems for spectrometers**
- Radio-isotopes productions techniques**

Added value:

(Accommodate a continuation of the ECOS-NA activities and coordination!)

TASK1:

ACCELERATOR R&D: Pushing the limits (S. ESSABAA)

Main Objectives

Development of superconducting materials, new fabrication methods, characterization techniques and innovative diagnostic tools for high RF performance, low cost SRF cavities dedicated to accelerators

Participating Laboratories and Institutes

Institute	Acronym	Country
CNRS/IN2P3/IPN Orsay	CNRS-Orsay	F
CNRS/IN2P3/CSNSM	CNRS-Orsay	F
CEA/DSM/IRFU	CEA	F
Uppsala University	Uppsala	SE
INFN Legnaro	INFN-LNL	I

Industrial Involvement

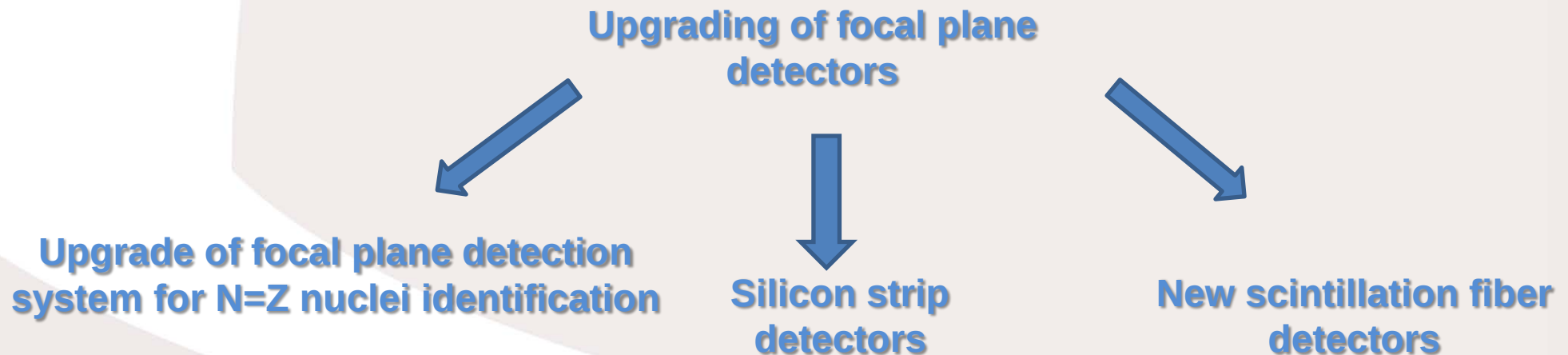
Company Name	Country
ABC SwissTech	CH
APERAM	Lux

TASK2:

NOVEL FOCAL PLAN DETECTION SYSTEMS FOR SPECTROMETERS

(F. CAPPUZZELLO & L. CACERAS)

Important upgrading of the existing facilities can be foreseen, especially in the view of emerging **detection technologies**, in order to extend the application of magnetic spectrometry to the more and more challenging experiments required by the present and future experiments (high intensity beams, multiparticle detections etc..)



TASK 3: ALPHA EMITTERS FOR CANCER THERAPY (U. Koster)

Innovative production of alpha emitters for medicine can demonstrate direct applications of NS technology and of ECOS facilities for societal needs.

FROM ENSAR TO ENS^AR²