

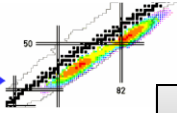


The SPIRAL2 Project

M. Lewitowicz
GANIL, CEA/DSM-CNRS/IN2P3, Caen, France

on behalf of the SPIRAL2 Project Group
&
Physics Collaborations

Spiral2



GANIL/SPIRAL1/SPIRAL2 facility

Caen, France

GANIL Beam time: 35 weeks/y (600 users)
SP2 Beam time: 44 weeks/y
ISOL RIB Beams: up to 53 weeks/y
Up to 50 % more users: 800-900
First experiments 2013

- Liberté • Égalité • Fraternité
REPUBLIQUE FRANÇAISE
- cea
- cnrs
- Région Basse-Normandie
- Conseil Général Calvados
- CAEN Normandie
- CaenIamer
- European Union Flag
- CAPACITIES

LINAC:
33MeV p
40 MeV d
14.5 AMeV HI

Neutrons
For Science

S3 separator-
spectrometer

DESIR Facility
low energy RIB

GANIL/SPIRAL 1
today

A/q=6 Injector option

A/q=2 source
p, d, ^{3,4}He 5mA

A/q=3 HI source
Up to 1mA

HRS+RFQ Cooler

RIB Production Cave
Up to 10¹⁴ fiss./sec.

CIME cyclotron RIB at 1-20 AMeV
(up to 10 AMeV for fiss.fragments)

Cost: 200M€ Funded + 7M€
operation cost + 20 M€ detectors

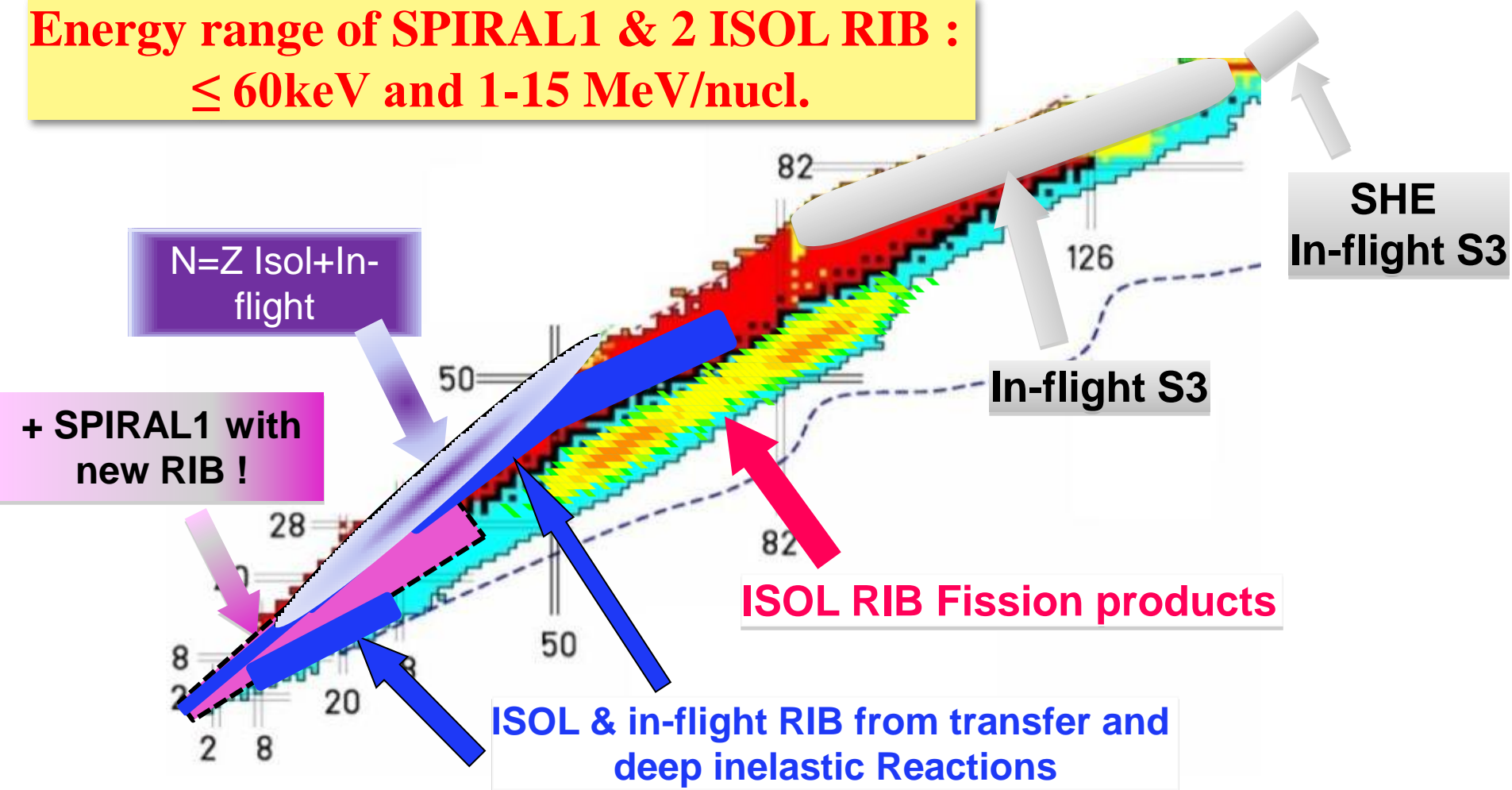
2 RIB + 3 Stable-ion beams (ARIBE, IRRSUD, SME) -> **5 experiments in parallel**

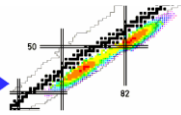
SPIRAL2 is one of the ESFRI list projects (45 most important EU research infrastructure projects)



RIB and nuclei far from stability accessible with SPIRAL1 & SPIRAL2

**Energy range of SPIRAL1 & 2 ISOL RIB :
 $\leq 60\text{keV}$ and $1\text{-}15\text{ MeV/nucleon}$.**

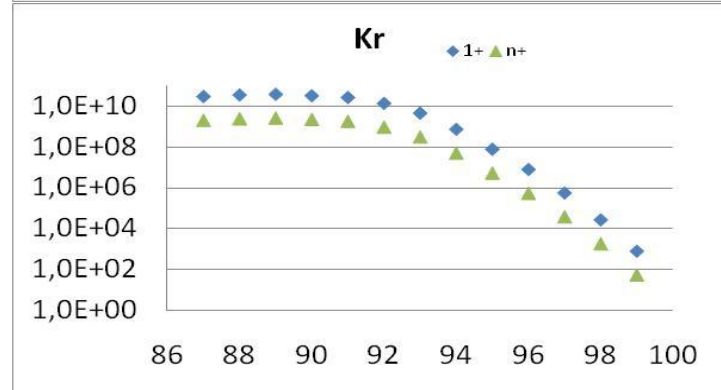
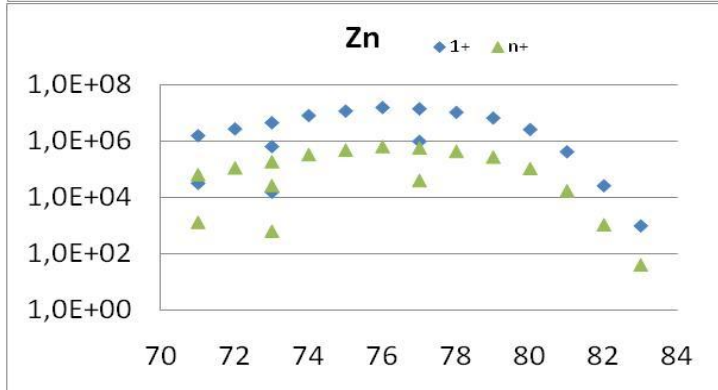
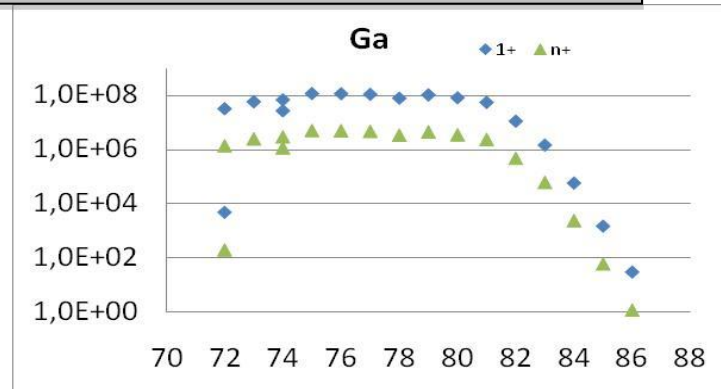
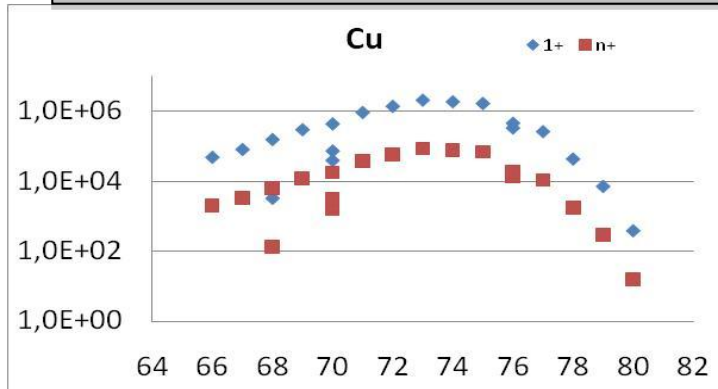




SPIRAL2 Phase 2 **Day 1** experiments

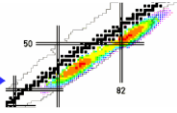
Restrictive assumption for the beginning of operation: 280g UCx target and 50kW deuteron beam power.

Examples of **Day 1 beams** of fission fragments (in pps):



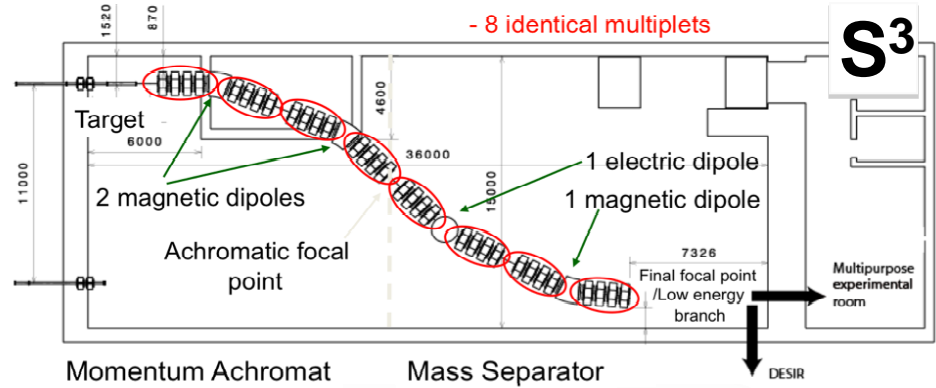
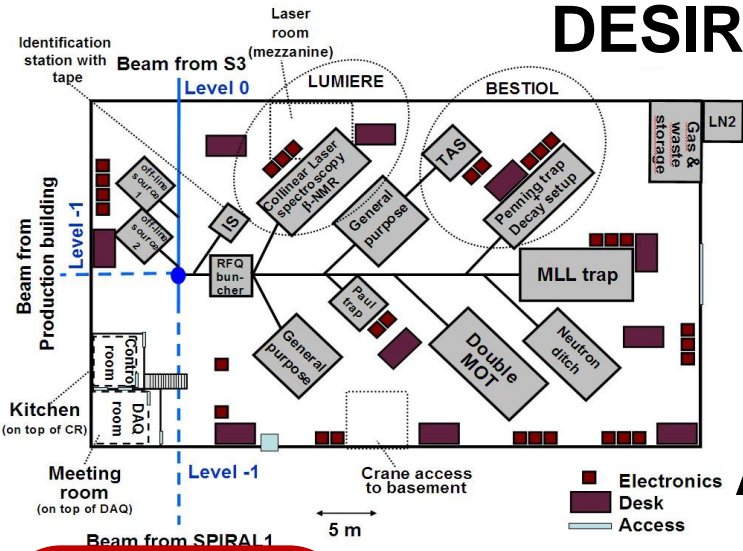
Nominal RIB intensities expected to be 15 times higher

> 600 different RIB of 25 elements produced in fission, fusion & transfer reactions

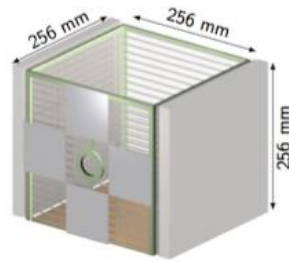


New detectors to be used at SPIRAL 2

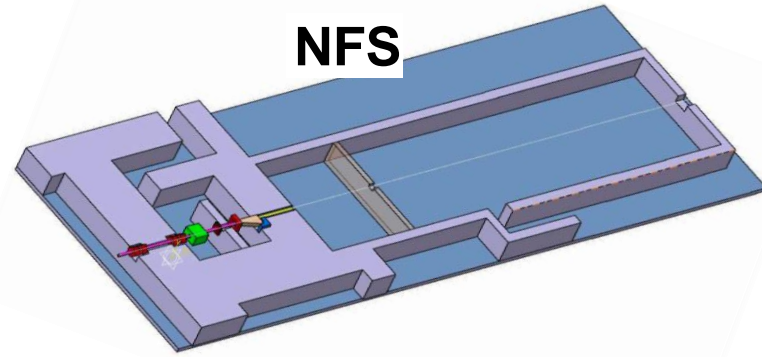
DESIR



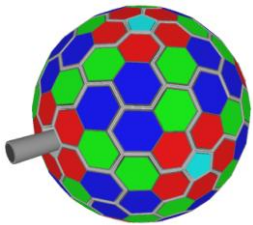
ACTAR & GET



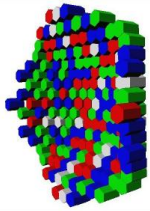
NFS



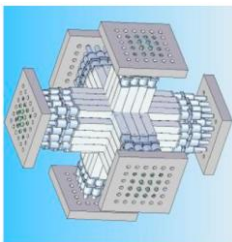
AGATA



NEDA



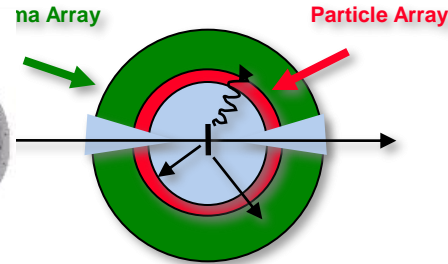
PARIS



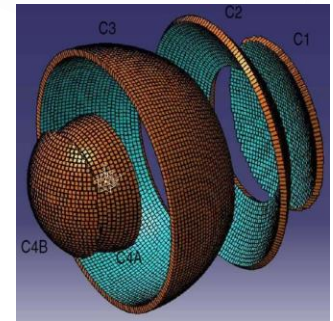
HELIOS



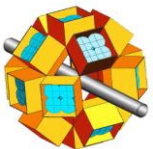
GASPARD



FAZIA



EXO GAM 2



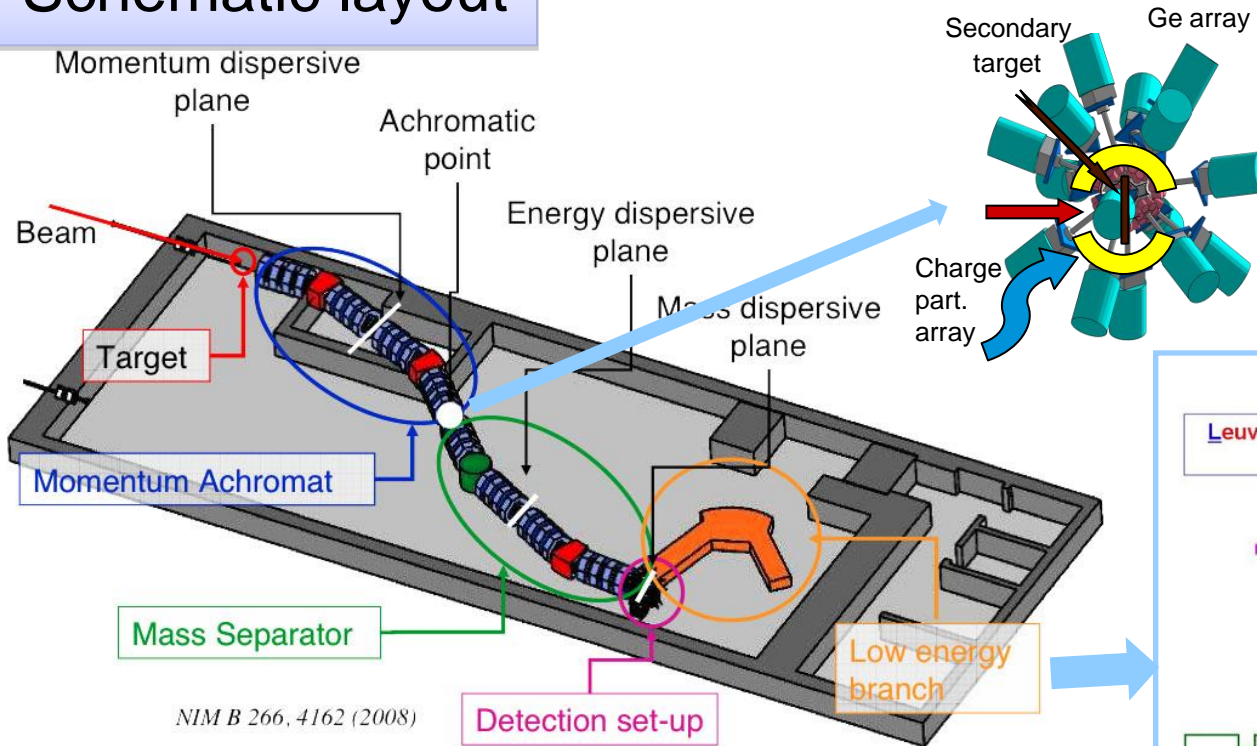
Super Separator Spectrometer (S3)



Collaboration



Schematic layout



104 physicists, 30 institutions, 12 countries
Management Board

Hervé SAVAJOLS – GANIL, France (Project leader)

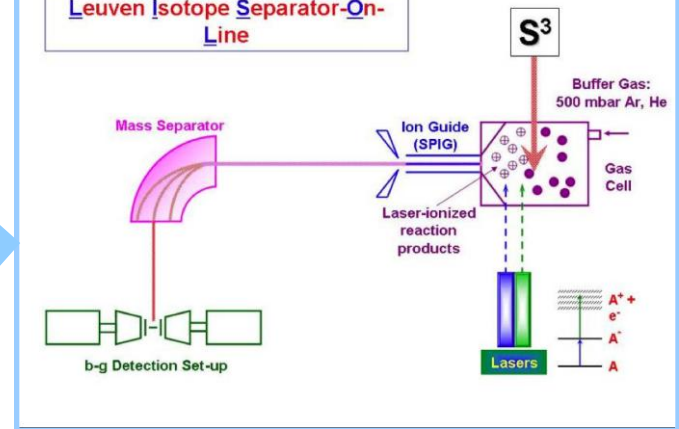
Antoine DROUART – Irfu/SPhN (CEA), France (Spokesperson)

Jerry A. NOLEN – Argonne National Laboratory, USA (Spokesperson)

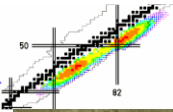
Martial Authier – Irfu/CEA, France (Technical Coord.)

Laser ionization in the S^3 gas catcher

Leuven Isotope Separator-On-Line



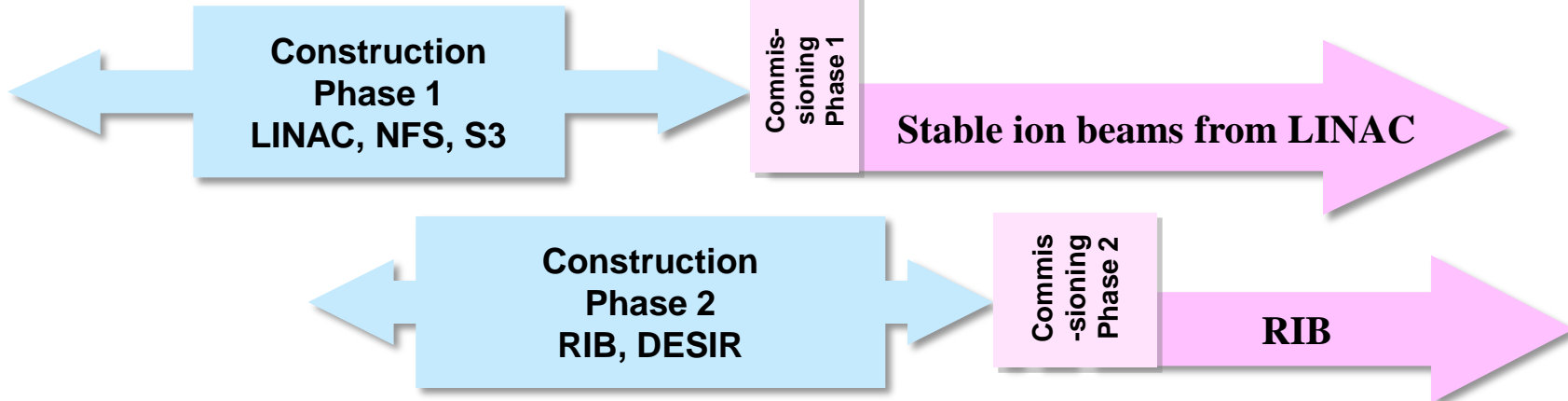
- Technically the project will be ready in 2011 to start the construction phase
- First experiment plan in 2013-2014



SPIRAL 2 timeline



2007 2008 2009 2010 2011 2012 2013 2014 2015 2016



DEMAND
D'AUTORI

de modification du
de l'installation nu
de base n°113 pour
le projet SPIRAL

April 2009 :
Safety files sent to
authorities

Safety Aspects Construction

July 2009 :
Construction permit Phase 1 requested

From 14th June to 15th July 2010
Public enquiry

GANIL CAEN
Boulevard Henri Becquerel
BP 55027 / 14076 CAEN cedex
www.ganil-spiral2.eu

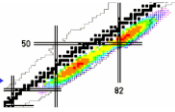
AVRIL 2009

11th October 2010
Permit of construction delivered

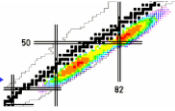
- PARTIE 1
Identification du pétitionnaire
- PARTIE 2
Document descriptif
- PARTIE 3
Etude d'impact
- PARTIE 4
Etude de maîtrise des risques
- PARTIE 5
Plan de démantèlement
- PARTIE 6
Plans réglementaires



Beginning of 2011
Site preparation – Ground breaking



- Call for Letters of Intent for Day One experiments at SPIRAL2 with RIB launched now (**dead-line December 17, 2010**)
- **Low-energy** (DESIR) and **Post-accelerated** (CIME) ISOL RIB beams from:
 - n-induced fission
 - light particle induced reactions
 - fusion evaporation



- [SPIRAL2 Week 2011](#) 24-27/01/2011; session dedicated to high resolution spectroscopy

SPIRAL2 Week
January 24-27
Caen, France

2011

