

DESIR

Désintégration, excitation et stockage d'ions radioactifs
Decay, excitation and storage of radioactive nuclei

Collaboration Agreement

1. Introduction

DESIR is a collaborative European project (hereafter referred to as the “Project”) to construct and operate the DESIR facility at SPIRAL2 of GANIL. The DESIR facility is constituted of the RFQ cooler SHIRaC, the high-resolution separator HRS, the beam lines from the different SPIRAL1/2 production sites including from S3, and the DESIR hall. DESIR will allow for a large variety of experiments at ISOL energies to be performed.

2. Purpose of this DECA

The purpose of this DECA is to specify what the members of the DESIR collaboration intend with respect to funding, and operating experimental equipment of the DESIR facility. This instrumentation is roughly grouped in three different domains: i) studies concerning beta decay are grouped together in the BESTIOL facility, laser spectroscopy experiments in the LUMIERE facility and experiments with traps in the DETRAP facility.

The (radioactive) beams will be delivered by GANIL-SPIRAL2 operators. GANIL will be in charge of safety and security issues associated to the use of the beams and of the equipment. If the equipment does not fulfil the security and safety requirements expressed by GANIL, the later party can veto the installation and the use of the equipment. GANIL will help the users to install their equipment and to use them in optimal conditions.

This DECA is the non-binding expression of the current intentions of the Parties. None of the Parties will be bound by any legal obligation to the other Parties or incur any associated expense.

The intention of the Parties is to provide the necessary capital and human resources to successfully carry out this project.

The items forming the DESIR facility, their costing, the sharing of the required capital investment and human resources, and the installation schedule foreseen and the milestones for the Project are given in Annexe B.

Any changes in the scope of the DESIR facility will be agreed upon at the DESIR steering committee, as described in Annexe C.

The DESIR facility is sited at GANIL/SPIRAL2 (Caen, France).

3. Parties of this DECA

This DESIR Collaboration Agreement (hereinafter “DECA”) is between the Parties to this DECA (hereinafter “the Parties”). These Parties are listed in Annexe A.1. They form the DESIR Collaboration during the construction and installation phases to which this DECA applies.

4. Commencement, Duration, Withdrawal and Extension of the DECA

This DECA will become effective when at least three Parties have signed including GANIL/SPIRAL2.

This DECA shall stay in force until 31 December 2015, which is the expected end of the construction phase of DESIR. This DECA may be extended only by an amendment to the DECA.

Any Party may withdraw from the DECA by giving not less than twelve months notice in writing to the DESIR Steering Committee. It is expected that general equipment as defined in Annexe B1 and provided by the Party will remain with DESIR for the period of this DECA.

5. Organisation and Management

The DESIR organisation and the governance bodies for the construction of DESIR are described in Annexe C.

DESIR is an open collaboration. New members may accede to this DECA through a written procedure defined by the DESIR Steering Committee.

6. Amendments and Modification of the DECA

This DECA may be amended or modified at any time in writing, if agreed by at least two thirds of the Parties. This procedure is also applied, when new parties want to join this DECA.

7. General Provisions

The Parties will conduct the collaboration in terms of this DECA in compliance with the applicable laws and regulations. The obligations of each Party are subject to the availability of appropriate funds and human resources.

Nothing in this DECA will affect any other agreement concerning cooperation between the Parties.

All questions regarding the interpretation of this DECA will be resolved consensually by the Parties. Any dispute that may arise between the Parties in connection with this DECA, which cannot be resolved amicably between the Parties, shall be finally settled by the Rules of Conciliation and Arbitration of the International Chamber of Commerce by three arbitrators

appointed in accordance with the said Rules, unless the Parties agree on a single arbitrator. The award of the arbitrator will be final and binding upon the Parties concerned. Proceedings shall be conducted in English.

Information provided by any Party under this DECA and implementing agreements shall be accurate to the best of that Party's knowledge and belief, but no warranty, expressed or implied, is given by that Party to such information.

Each Party takes charge of the insurance coverage for its own staff in accordance with applicable legal requirements for occupational injuries and occupational diseases. Consequently, each party must fulfil the required formalities and sustain all the costs, if any, involved in the insurances underwritten to cover its own staff against the risks.

Each Party is liable, in accordance with the applicable law, for damages caused by its staff to the staff of any other Party.

Each Party will bear the liability without any right of claim against any other Party, except in cases of gross negligence or wilful misconduct, for any damage to its own properties resulting from or in the course of fulfilment of this DECA.

Each Party remains liable, in accordance with the applicable legal regulations, for damages caused by itself or its staff to third Parties occurring under this DECA.

8. Technical Provisions

The equipment at the DESIR facility is divided into:

(i) Experiment equipment, which will be the responsibility of individual groups, and (ii) common equipment, which the Collaboration has agreed to provide at its common expense. The former stays a property of the individual groups, whereas the latter becomes a general equipment of DESIR (see Annexe B1).

All equipment brought to *DESIR* shall comply with GANIL's safety and security regulations. The design, test criteria and testing of equipment should be discussed well in advance with GANIL's safety and security officials. All equipment brought to DESIR shall be accessible for inspection by the DESIR Technical Coordinator and by the GANIL safety and security officials at any time.

Floor space allocation for the experiments shall be co-ordinated by the DESIR Project Manager.

The following documents and annexes are an integral part of this DECA:

Annexe A:	List of Parties
Annexe B:	DESIR Equipment, Capital Investment and Installation
Annexe C:	DESIR Management Structure

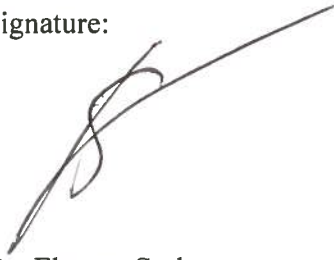
This DECA is drawn up and executed in English, in one original document.

9. Signatures

As witness: the Parties have caused this Collaboration Agreement to be duly signed by the undersigned authorized representatives in separate signature pages, the day and year first above written.

Date: 26/01/2012

Signature:

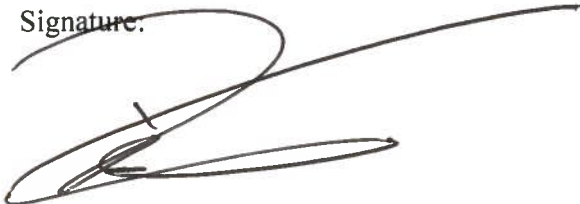
A handwritten signature in black ink, appearing to be "F. Staley", written over a horizontal line.

Dr. Florent Staley
Director of Grand Accélérateur National
d'Ions Lourds, Caen

As witness: the Parties have caused this Collaboration Agreement to be duly signed by the undersigned authorized representatives in separate signature pages, the day and year first above written.

Date: 26/01/2012

Signature:

A large, stylized handwritten signature in black ink, consisting of several loops and a long horizontal stroke extending to the right.

Pr. Philippe Moretto
Director of Centre d'Etudes Nucléaires de Bordeaux-Gradignan
Université Bordeaux I and CNRS/IN2P3

As witness: the Parties have caused this Collaboration Agreement to be duly signed by the undersigned authorized representatives in separate signature pages, the day and year first above written.

Date: 23/01/2012

Signature:



G. CHARDIN
DIRECTEUR DU CSNSM



Dr. Gabriel Chardin
Director of Centre de Spectrométrie Nucléaire et de Spectrométrie de Masse
Université Paris Sud and CNRS/IN2P3

As witness: the Parties have caused this Collaboration Agreement to be duly signed by the undersigned authorized representatives in separate signature pages, the day and year first above written.

Date: *le 21 Janvier 2014*

Signature:



Dr. Christelle Roy
Director of Institut Pluridisciplinaire Hubert Curien
Université Strasbourg and CNRS/IN2P3

As witness: the Parties have caused this Collaboration Agreement to be duly signed by the undersigned authorized representatives in separate signature pages, the day and year first above written.

Date: 26/01/2012

Signature:

A handwritten signature in black ink, appearing to be "F. Azaiez", written over a horizontal line.

Dr. Fayçal Azaiez
Director of Institut de Physique Nucléaire d'Orsay,
Université Paris Sud and CNRS/IN2P3

As witness: the Parties have caused this Collaboration Agreement to be duly signed by the undersigned authorized representatives in separate signature pages, the day and year first above written.

Date: 26/01/2012

Signature:

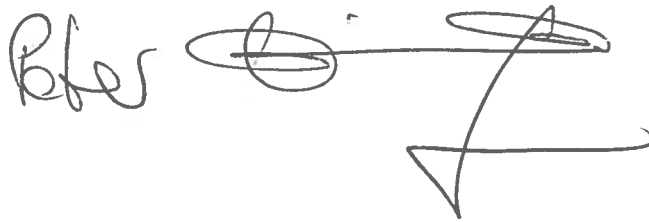
A handwritten signature in black ink, appearing to read "Durand".

Dr. Dominique Durand
Director of Laboratoire de Physique Corpusculaire de Caen
ENSICAEN, Université Caen Basse Normandie and CNRS/IN2P3

As witness: the Parties have caused this Collaboration Agreement to be duly signed by the undersigned authorized representatives in separate signature pages, the day and year first above written.

Date: 16. 1. 2012

Signature:

A handwritten signature in black ink, appearing to be "P. Thierolf", followed by a large, stylized flourish consisting of several overlapping loops and a long horizontal stroke.

Priv. Doz. Dr. Peter G. Thirolf
Head of Nuclear Science Group
LMU Munich

As witness: the Parties have caused this Collaboration Agreement to be duly signed by the undersigned authorized representatives in separate signature pages, the day and year first above written.

Date: 23 JANUARY 2012

Signature:



Dr. Guillermo Mena Marugan
Director del Instituto de Estructura de la Materia
CSIC Madrid

As witness: the Parties have caused this Collaboration Agreement to be duly signed by the undersigned authorized representatives in separate signature pages, the day and year first above written.

Date: 26/01/2012

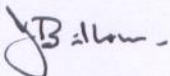
Signature:



Pr. Gerda Neyens
Head of the Nuclear Moments Group
K.U. Leuven

As witness: the Parties have caused this Collaboration Agreement to be duly signed by the undersigned authorized representatives in separate signature pages, the day and year first above written.

Date: 20 January 2012

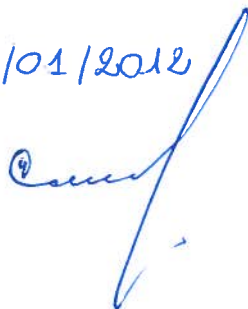
Signature: 

Pr. Jonathan Billowes
Head of Nuclear Physics Group
University of Manchester

As witness: the Parties have caused this Collaboration Agreement to be duly signed by the undersigned authorized representatives in separate signature pages, the day and year first above written.

Date: 20/01/2012

Signature:

A handwritten signature in blue ink, appearing to be "Sergey Dmitriev".

Pr. Sergey Dmitriev
Director Flerov Laboratory of Nuclear Reactions, JINR

Dubna

A handwritten signature in blue ink, appearing to be "Sergey Dmitriev".

As witness: the Parties have caused this Collaboration Agreement to be duly signed by the undersigned authorized representatives in separate signature pages, the day and year first above written.

Date: 26/01/2012

Signature:

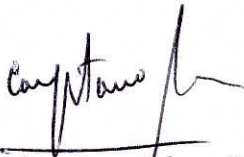
A handwritten signature in blue ink, appearing to read "F. Botella", is written over two horizontal blue lines.

Pr. Francisco Botella Olcina
Director IFIC
CSIC & University of Valencia

As witness: the Parties have caused this Collaboration Agreement to be duly signed by the undersigned authorized representatives in separate signature pages, the day and year first above written.

Date:

Signature:




Dr. Cayetano López Martínez
Director General
CIEMAT Madrid

As witness: the Parties have caused this Collaboration Agreement to be duly signed by the undersigned authorized representatives in separate signature pages, the day and year first above written.

Date:

Signature:

A handwritten signature in blue ink, appearing to read "Pr. Francisco Calvino Tavares".

Pr. Francisco Calvino Tavares
Nuclear Engineering Section
UPC Barcelona

Annexe A: List of Parties

- GANIL/SPIRAL2, CEA-DSM/CNRS-IN2P3
- CEN Bordeaux-Gradignan, CNRS-IN2P3/Université de Bordeaux 1
- CSNSM Orsay, CNRS-IN2P3/Université Paris 11
- IPHC Strasbourg, CNRS-IN2P3/Université de Strasbourg
- IPN Orsay, CNRS-IN2P3/Université Paris 11
- LPC Caen, CNRS-IN2P3/Université de Basse-Normandie, ENSICAEN
- LMU München
- Instituto de Estructura de la Materia IEM-CSIC Madrid
- K.U. Leuven
- University of Manchester
- FLNR JINR Dubna
- Instituto de Física Corpuscular IFIC-CSIC Valencia
- CIEMAT Madrid
- UPC Barcelona

Annexe B: DESIR Equipment, Capital Investment and Installation

Annexe B.1: DESIR Equipment and Capital Investment

Specifications of all items will be produced by the DESIR management prior to production. All cost estimates are based on 2011 prices in Euro without tax.

Definition of equipment:

General DESIR equipment (laboratory responsible):

- RFQ cooler SHIRaC (LPC Caen)
- High-resolution separator HRS (CEN Bordeaux-Gradignan)
- DESIR beam lines (IPN Orsay)
- Stable ion sources (CEN Bordeaux-Gradignan)
- General purpose ion buncher GPIB (CSNSM Orsay)
- DESIR identification station (IPHC Strasbourg)

Experiment equipment to be used at DESIR:

- Laser spectroscopy setup LUMIERE (IPN Orsay, K.U. Leuven, U. Manchester)
- The BESTIOL facility
 - Total absorption gamma-ray spectrometer TAGS (IFIC Valencia)
 - BESTIOL double Penning-trap PIPERADE (CEN Bordeaux-Gradignan)
 - Neutron ToF detector (LPC Caen, CIEMAT Madrid)
 - Charged particle array Silicon cube (CSIC Madrid, CEN Bordeaux-Gradignan)
 - Beta-decay station BEDO (IPN Orsay)
 - Neutron detector BELEN (U. Barcelona)
 - Neutron multiplicity detector TETRA (FLNR JINR Dubna)
- The DETRAP facility
 - MLL Penning trap (LMU Munich)
 - LPC Paul trap (LPC Caen)

Cost for general DESIR items:

• RFQ cooler SHIRaC:	400 k€
• High-resolution separator HRS	2000 k€
• DESIR beam lines	3960 k€
• Remote control of beam lines equipments	1500 k€
• DESIR hall	7342 k€
• Radioprotection Laboratory	87 k€
• Workshops equipment	57 k€
• Stable ion sources	59 k€
• General purpose ion buncher GPIB	390 k€
• DESIR identification station	209 k€

Cost for DESIR experiments:

• Laser spectroscopy setup LUMIERE	1000 k€
• Total absorption gamma-ray spectrometer TAGS	340 k€
• DESIR double Penning-trap PIPERADE	844 k€
• Neutron ToF detector	580 k€
• Charged particle array Silicon cube	240 k€
• Beta-decay station BEDO	250 k€
• MLL Penning trap	700 k€
• LPC Paul trap	500 k€
• Neutron detector BELEN	150 k€
• Neutron multiplicity detector TETRA	300 k€

Annexe B.2 Sharing of Capital investment and Human resources

The Parties are planning to make bids to contribute with the capital given in table B.2.1, as given in annexe B.1. In-kind contributions will be made, whenever possible, allowing making best use of the expertise and experience acquired during the R&D phase. The first three DESIR items (RFQ cooler SHIRaC, the HRS, the beam lines) are not included, as they will be financed by different means (CPER, EQUIPEX). For some of the equipment, the full amount mentioned in table B.1 is not yet reached in table B2.1. For this equipment, the numbers in table B.2.1 correspond to phase 1 of the full project.

The Parties are planning to make human resources (physicists, engineers and technicians) as given in table B.2.1 available to the *DESIR* project (personnel in person-months).

Table B.2.1 Capital investment and human resources committed for the DESIR R&D and installation phase.

Party	Planned capital investment (k€)	Funds committed (k€)	Personnel in person months
EU	0	241	0
GANIL Caen	0	0	53.4
CENBG Bordeaux	0	657	200
IPHC Strasbourg	209	0	24.1
LPC Caen (LPCTrap)	200	300	10
LPC Caen (Neutron-TOF)	235	45	15
CSNSM Orsay	0	187	76
IPN Orsay (LASER)	137	177	0
IPN Orsay (BEDO)	250	0	40
LMU Munich	0	700	18
University of Manchester	150	70	12
KU Leuven	200	100	12
IFIC-CSIC Valencia	0	340	10
IEM-CSIC Madrid	0	240	10
CIEMAT Madrid	0	300	10
UPC Barcelona	0	150	12
FLNR JINR Dubna	200	100	16
Total	1 381	3 727	518.5

Annexe B.3: Construction schedule and Milestones

Provisional planning and milestones for the construction and installation of the DESIR facility.

Month/year	Item
05/2014	completion of the DESIR beam line tunnels
06/2014	installation of beam lines
06/2014	completion of the DESIR hall
07/2014	installation of the general purpose equipment
03/2015	installation of parts of the BESTIOL equipment
07/2015	completion of the LPC Paul trap
09/2015	completion of the MLL trap in DESIR
12/2015	completion of phase 1 of the LUMIERE facility
12/2015	completion of beam lines

Annexe C:

DECA Management Structure

The organisation for the construction and the commissioning of the DESIR experimental equipments comprises the following bodies:

- The DESIR Steering Committee, acting on behalf of the Parties, is responsible for the Project coordination and the science policy of the collaboration.
- The DESIR Collaboration Council, representing all Parties under the DESIR project, advises the DESIR Steering Committee on scientific matters.
- The DESIR Management Board is responsible for the execution of the Project along the lines defined by the DESIR Steering Committee.

The terms of reference of each of these bodies is given in more detail below.

DESIR Steering Committee

Membership:

Members are nominated by the Parties of the DECA. Each party will have one member.

The DESIR Spokesperson attends meetings for consultation only and therefore without voting rights. The DESIR Steering Committee can invite others to attend as needed for consultation only, for example the DESIR Facility Coordinator.

Voting rights:

All members have equal voting rights. The GANIL representative has a veto right in case equipment does not comply with GANIL security and safety rules.

Terms of reference:

The DESIR Steering Committee is the decision-making body of the DESIR Collaboration and responsible for the allocation of resources supplied by the Parties. The DESIR Steering Committee, in agreement with the scientific bodies of GANIL, will ensure that the primary criterion for deployment of any equipment is based on scientific merit and obey the GANIL safety and security rules.

The tasks of the Steering Committee are as follows:

1. Define the scientific policy of the DESIR Collaboration taking advice from the DESIR Collaboration Council.
2. Elect a chair and vice-chair among its members who will each serve for a period of two years.
3. Appoint members of the DESIR Management Board.
4. Monitor the Project based on reports received from the DESIR Spokesperson.
5. Decide on any modification of the Project proposed by the DESIR Spokesperson.
6. Review the progress of the DESIR project based on reports received from the DESIR Spokesperson.

7. Review the cost statements and allocations.

Decisions in the DESIR Steering Committee shall be taken by consensus.

The DESIR Steering Committee shall not make any decision unless a quorum of two thirds of the members are represented.

Minutes of each meeting shall be drafted by the chairperson to the other members without delay. The minutes of each meeting shall be considered as accepted by the other members if, within thirty calendar days from receipt, the other members have not objected in writing to the chairperson.

The DESIR Steering Committee chair signs on behalf of the DESIR Steering Committee all written agreements.

DESIR Collaboration Council

Membership:

One representative from each Party, the DESIR Spokesperson and the DESIR facility coordinator. The DESIR Spokesperson chairs the meetings of the DESIR Collaboration Council.

Voting:

All members have equal voting rights. The DESIR Spokesperson is excluded from any vote concerning the Spokesperson's role.

Terms of Reference:

The DESIR Collaboration Council is the advisory body of the DESIR Steering Committee on scientific matters concerning the DESIR facility.

The tasks of the DESIR Collaboration Council are as follows:

1. Elect the DESIR Spokesperson who will serve for a period of two years.
2. Advise the DESIR Steering Committee on scientific matters concerning the DESIR facility and the research programme through the DESIR Spokesperson.
3. Hold meetings, at least annually, to receive reports from the DESIR Steering Committee and DESIR Management Board on the progress of DESIR and from the DESIR Spokesperson on the progress of the installation programme.
4. Hold an annual open meeting of the DESIR collaboration to present the status of DESIR and to discuss future evolutions.

DESIR Management Board

Membership of the DESIR Management Board:

The DESIR Spokesperson, the DESIR Facility Coordinator, chairpersons of the major setups at DESIR (LUMIERE, BESTIOL, DETRAP), chairperson of the DESIR Steering Committee (ex-officio). The DESIR Spokesperson will chair the DESIR Management Board meetings.

Voting rights:

All members have equal voting rights.

Terms of Reference:

The DESIR Management Board runs the DESIR facility. The DESIR Management Board shall report to and be accountable to the DESIR Steering Committee through the DESIR Spokesperson.

The tasks of the DESIR Management Board are as follows:

1. Supervise the effective and efficient installation of the facility.
2. Collect information on the progress of DESIR, examine that information to assess the compliance of the Project with the programme decided by the DESIR Steering Committee and, if necessary, propose modifications of the programme to the DESIR Steering Committee.
3. Provide reports of the progress of DESIR to the DESIR Steering Committee including an annual planning and resource report.
4. Advise the DESIR Steering Committee on technical issues.
5. Work with the spokespersons of the DESIR equipment or equipment installed in DESIR to ensure the successful operation of DESIR.
6. Organise DESIR working group meetings as needed.

DESIR Spokesperson

The DESIR Spokesperson is elected by the DESIR Collaboration Council to coordinate the DESIR collaboration. For this purpose the Spokesperson can create and dissolve working groups as needed and after acceptance of the DESIR Steering Committee. The Spokesperson will nominate the chairpersons of these working groups.

DESIR Facility Coordinator

The DESIR Facility Coordinator is nominated by GANIL. He supervises all technical issues of the DESIR facility on a daily basis. He/She regularly reports to the DESIR Spokesperson. The DESIR Facility Coordinator is a full member of the DESIR Management Board and of the DESIR Collaboration Council.

Annexe D:

Experiment equipment to be used at DESIR

1. Group of Instituto de Estructura de la Materia, IEM-CSIC, Madrid

The contribution consists in setting up a line for general purpose beta decay studies.

Vacuum:

Vacuum chamber	15.000	
Pumps and control	25.000	40.000

Silicon:

Telescope=DSSSD + PAD	10.000 x6	60.000
Electronics 200 channels x 150 €	30.000	90.000

Gamma:

CEPA phoswich LABrLaCL Array		60.000
Digitizer	10.000	70.000

DAQ:

VME	5.000	
CPU	5.000	
NIM-logic	10.000	
TDC	10.000	
Scaler	10.000	40.000

TOTAL

=====

240.000

2. Equipment from Instituto de Fisica Corpuscular, IFIC-CSIC, Valencia

The equipment comprises a total absorption gamma-ray spectrometer for beta-decay studies and the associated electronics and data acquisition system.

Item	Cost (in euro)
BaF ₂ 12-fold segmented spectrometer	185000
Electronics for spectrometer	37800
Ancillary detectors (plastic, Si, HPGE)	22000
Electronics for ancillary detectors	17800
Trigger electronics	20900
Data acquisition system	39500
Lead shielding	12000
Mechanical support	5000
TOTAL	340000

3. Equipment from the Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas, CIEMAT, Madrid

The equipment comprises a neutron spectrometer made of 30 liquid scintillator cells for beta-decay studies, electronics and mechanical structure.

Item	Cost (in euro)
30 cells of BC501A	180000
30 Hamamatsu R4144 photomultipliers	60000
Electronics for the spectrometer	30000
Data acquisition system	60000
Mechanical support	10000
	=====
TOTAL	340000