

**AGATA Development plan**

**Version 1.0, January 2022**

**Contributors: E. Clément,**

1. **Introduction**

The present document is the development plan of the AGATA Phase 2.

The objectives of Phase 2 funded by the MoU are :

* Acquiring 78 Asymmetric segmented HPGe capsules
* Acquiring 26 AGATA Triple cryostats
* 1 Po storage disk
* Data Acquisition Infrastructures such as network switchs and blades for services
* The computer farm (HPC) for the PSA on-line treatment of 135 capsules
* A Detector Support System for 135 capsules including Low and High voltages supplies, LN2 auto-fill system and related cables.
* An up-to-date Data Base
* A set of software algorithms for on-line and off line data processing
* A framework for Data Analysis
* A unique mechanical structure holding 45 AGATA Triple cryostats with possibility of opening perpendicularly to the beam direction
* A unique Front and back electronic for 135 capsules (Analog preamps, digitizer DIGOPT12, Processing PACE-STARE with clock and trigger functionalities (GTS/SMART)) and its software control.
* State of the art simulation package and performances control.

The AGATA Project includes a continous R&D activities which is included in each Working Group structures. In the following, this is identified in green color.

The AGATA Project definition (TDR ) is :

<https://atrium.in2p3.fr/b1eab32e-7839-4381-80d9-f8a52e5aece3>

# Organization.

**1.1 Organigram**

The AMB organigram :

<https://atrium.in2p3.fr/3fe075a1-7588-4ffa-a8c4-1fcf914b8e17>

 **1.2 Document Sever**

The documents related to the project are hosted in ATRIUM <https://atrium.in2p3.fr/>

 **1.3 Management Plan**

<https://atrium.in2p3.fr/76b42f22-8e13-4d8a-be31-21bf5433671c>

**1.4 AGATA Project Breakdown Structure**

[**https://atrium.in2p3.fr/261f72bf-ccda-4a6e-b03d-d2674dab4f4a**](https://atrium.in2p3.fr/261f72bf-ccda-4a6e-b03d-d2674dab4f4a)

# Tasks Definition.

- **Task 1** « **Detectors » (H. Hess)**

 **-Task 1.1 « AGATA Detector and Cryostat Module»***: M. Zielinska (Phy) / M.H. Sigward (Tech)*

Keep track on the AGATA capsules and cryostat order and delivery of new capsules

Keep track and coordinate the repair of the capsules and cryostat

Update the available pool of AGATA Triple Cluster for Data taking

Ensure a direct coordination with the capsules and cryostat manufacturers

 -**Task 1.2** **« Detector Acceptance Test and maintenance» :** *H. Boston*

Organize and coordinate the Customer Acceptance Test for all AGATA reference detector labs

Organize and coordinate the maintenance schedule and task for the repair of the AGATA Cluster

-**Task 1.3** « Applications and R&D on Ge Detectors » : *D. Judson*

 *Coordinate the R&D activity on the Ge detectors inside the collaboration*

*Coordinate and organize the activities for societal application of the AGATA technologies*

- **Task N°2** : « **Front-End electronic » (A. Gadea)**

-**Task 2.1 « Front End »** : *A. Pullia*

2.1.1 Digitizers A. Pullia

Develop the hardware of the AGATA digitizer DIGOPT12

Develop the mechanic, power supply and cooling of the DIGOPT12

Develop and test the DIGOPT12 firmware

Develop and test the DIGOPT12 slow control

Coordinate and validate the test of the digitizer DIGOPT12

Organize the mass production of the AGATA digitizer DIGOPT12

Provide the relevant documentation of the DIGOPT12

Do the maintenance of the DIGOPT12

2.1.2 Segment Pre-amplifier . A.Pullia

Maintaining the AGATA segment preamplifier blue prints

Coordinate the test bench

Ensure the communication with the company producing the PAC

Survey and provision of obsolete chips like FET

Coordinate the repair of broken boards

 2.1.2.a Milano Design *A. Pullia*

 2.1.2.b GANIL Design *P. Bourgeault*

2.1.3 Core Pre-amplifier, H. Hess

Maintaining the AGATA preamplifier core blue print

Coordinate the test bench

Ensure the communication with the company producing the PAC

Survey and provision of obsolete chips like FET

Coordinate the repair of broken chips

**-Task 2.2  « Pre-processing»** : *I. Lazarus*

 2.2.1 PACE (J. Collado)

 Develop, produce and test the PACE motherboard

 Provide documentation

 Organize the mass production

 Do the maintenance of PACE

 2.2.2 CAP\_Input (J. Collado)

Deliver the CAP preprocessing energy and Trigger firmware

Deliver the CAP Readout Control firmware

Implement the GTS/SMART IP

Organize the mass order of the CAP SOM

Upgrade if necessary

 2.2.3 CAP\_Output(N. Karkour)

 Deliver the CAP Event Builder firmware

 Deliver the CAP STARE formatter firmware

Deliver the CAP Inspection firmware

Deliver the CAP Control firmware

Deliver IPbus server and bridge for CAP

Upgrade if necessary

 2.2.4 IDM-CERDES (J. Collado)

 Deliver the CERDES Data receiver firmware

Upgrade if necessary

 2.2.5 STARE (N. Karkour)

Organize the mass production of 180 STARE board

Deliver the STARE firmware

Upgrade if necessary

Coordinate maintenance and repairs

 2.2.6 AURORA link (J. Collado)

 Deliver the AURORA Link between CAP and STARE

2.2.7 Mechanics and Power supply (V. Gonzalez)

 Provide the mechanical integration and power supply for PACE

2.2.8 Global integration (J. Collado)

 Ensure the full integration of the electronic chain

 Conduct the reference test

 Provide the final validation before mass production

-**Task 2.3 « Global Clock, Synchronization and Trigger»** : *G. Wittwer*

GTS (A. Boujrad)

Deliver a high-level trigger module for 255 GTS IP

SMART (G. Wittwer)

Deliver a clock and trigger system based on microTCA SMART

Deliver the firmware

Deliver the slow control

Organize the mass production for AGATA

Conduct test and validation

-**Task 2.4 « Coupling to ancillaries »** : *A. Goasduff*

Providing a front end module to coupled AGATA with GTS or SMART clock and trigger distribution to ancillary detectors

- **Task N°3 : « Data Processing » (O. Stézowski)**

 -**Task 3.1 « DAQ Infrastructure » :** Master/HostLab = IJCLab (*J. Jacob)* /LNL

3.1.1 CEPH J. Jacob / N. Toniolo

Upgrade, manage and maintain the on-site data storage system

3.1.2 Workstation P. Lejeannic/ N. Toniolo

Upgrade, manage and maintain the on-site computing hardware system, including services, gateways and PSA nodes workstation

3.1.3 Network P. Lejeannic/ M. Roetto

Upgrade, manage and maintain the on-site network hardware system

 -**Task 3.2 « Data Processing»** : IJClab *E. Legay*

3.2.1 Deliver the Topology Manager for FEBEE and DCOD (S. Elloumi)

3.2.2 Deliver the slow control software and GUI (E. Legay)

3.2.3 Maintain the ADA DCOD software (N. Dosmes)

3.2.4 Deliver the STARE Queue Manager (M. Tauriga-Quere)

3.2.5 Code profiling and optimization (V. Lafage)

3.2.6 DAQ architectures (E. Legay/ Philippon)

 -**Task 3.3 « Analysis & Reprocessing »** : *J. Dudouet*

Maintain and upgrade the off-line scientific software of AGATA for Data Processing

Develop and integrate the software for ancillaries

Produce a detailed documentation of the AGATA data processing

Organize Data Analysis School

Organize the long term storage of data (GRID, iRods)

Maintain the DMP

 -**Task 3.5 « Online/offline Interoperability »** : *G. Baulieu*

Maintenance and documentation of **the on-line** Embedded C++ physics processing

 Upgrade and validation of new actors

- **Task N°4** : « **Infrastructure » (B. Million)**

**-Task 4.1 « DSS » :** *R. Menegazzo*

4.1.1 Low Voltage (A. Lotodé)

 Develop and test the Low Voltage Unit for AGATA

 Organize the mass production of the unit and cables

 Organize the maintenance with the company

4.1.2 High Voltage (*R. Menegazzo)*

Purchase the High Voltage Unit for AGATA

 Purchase the High Voltage cables

4.1.3 LN2 (*T. Joannem)*

 Develop and test the AutoFill system and control for LN2

 Develop and test the User Interface

 Organize the production

 Coordinate the maintenance

4.1.4 Cables (*R. Menegazzo)*

Purchase the MDR cables for AGATA

4.1.5 Patch Box (*R. Menegazzo)*

Coordinate the mass production of the Detector Patch Box

 Coordinate the maintenance

**-Task 4.2 «Mechanics » :** *R. Smith*

4.2.1 Holding mechanics (R. Smith)

Design, construct and lead the installation of the mechanical holding structure of AGATA

Archive all blue print

Interaction with the design office of the host lab for local installation

Interaction with the ancillaries detectors designers

Survey management

4.2.2 CEM (N. Karkour)

 Advise on CEM design during the preparation of the host lab installation

 Perform qualification measurement on-site

**-Task 4.3 «AGATA Array Databases » :** *C. Aufranc*

Maintain the AGATA Data Base

Act as reference person for host lab contact for Data Base

Develop new tools into the Data Base framework

Join the installation and decommissioning activity at the host labs

- **Task N°5 : « PSA & Tracking »  A. Boston**

 -**Task 5.1 « PSA Algorithm** » : *L. J. Harkness*

Developing new PSA algorithm to enhanced the AGATA sensitivity

Demonstrating the enhanced performances

Making the link for the deployment of the validated algorithms with task 3.5

 -**Task 5.2 « Scanning table and characterization »** : *( To be defined ?)*

Coordinating the use of the Scanning table by AGATA

Defining the objective and deliverable of the scanning table measurement

Making the scanning table available to the collaboration with proper document, format and references

-**Task 5.3 « Tracking Alogrithm »** : *A. Lopez-Martens*

Maintaining and upgrading the OFT code

Developing new tracking algorithm

Demonstrating the enhanced performances

Making the link for the deployment of the validated algorithms with task 3.5

**- Task N°6 « Performance and Simulation » (M. Labiche)**

-Task 6.1 « AGATA Performances » J. Ljungvall

Keeping track on the AGATA performances

Advise at the AMB on the presented performances into physics and technical papers

Contributing in the analysis of reference source measurement and in-beam commissioning

 Proposing specific off-beam measurement

-Task 6.2 « AGATA Commissioning » F. Crespi

 Proposing and organizing AGATA in-beam commissioning

-Task 6.3 « AGATA Simulation » M. Labiche

 Maintaining and developing the AGATA GEANT4 package

 Providing documentation for the use of the AGATA GEANT4

Organizing AGATA GEANT4 schools

Assist the task 6.2 and 6.1 in the analysis and publication

# Human Resources

<https://atrium.in2p3.fr/b886102e-75bc-4a96-abc5-3844af189c06>

# Budget

<https://atrium.in2p3.fr/ed8595c8-5f72-4a40-a29b-9fa4f391e795>

# Showstoppers

1. FEBEE test in T1 2022
2. FEBEE test & Integration end 2022
3. SMART Migration 2025
4. DAQ architecture 2025

# Planning

<https://atrium.in2p3.fr/535af781-6b88-480f-af20-4da472a54f89>

# Risks

<https://atrium.in2p3.fr/ba960852-ccf2-4cba-82b8-fb870b10f2ee>