



# Project Manager Report

ASC - November 2021



**THANK YOU  
ANDRES**





Went in this



After 7 years of campaigns,  
on the 6<sup>th</sup> of September,  
AGATA left GANIL

Left in this



29 experiments



558 To of data



6568 hours beam on target



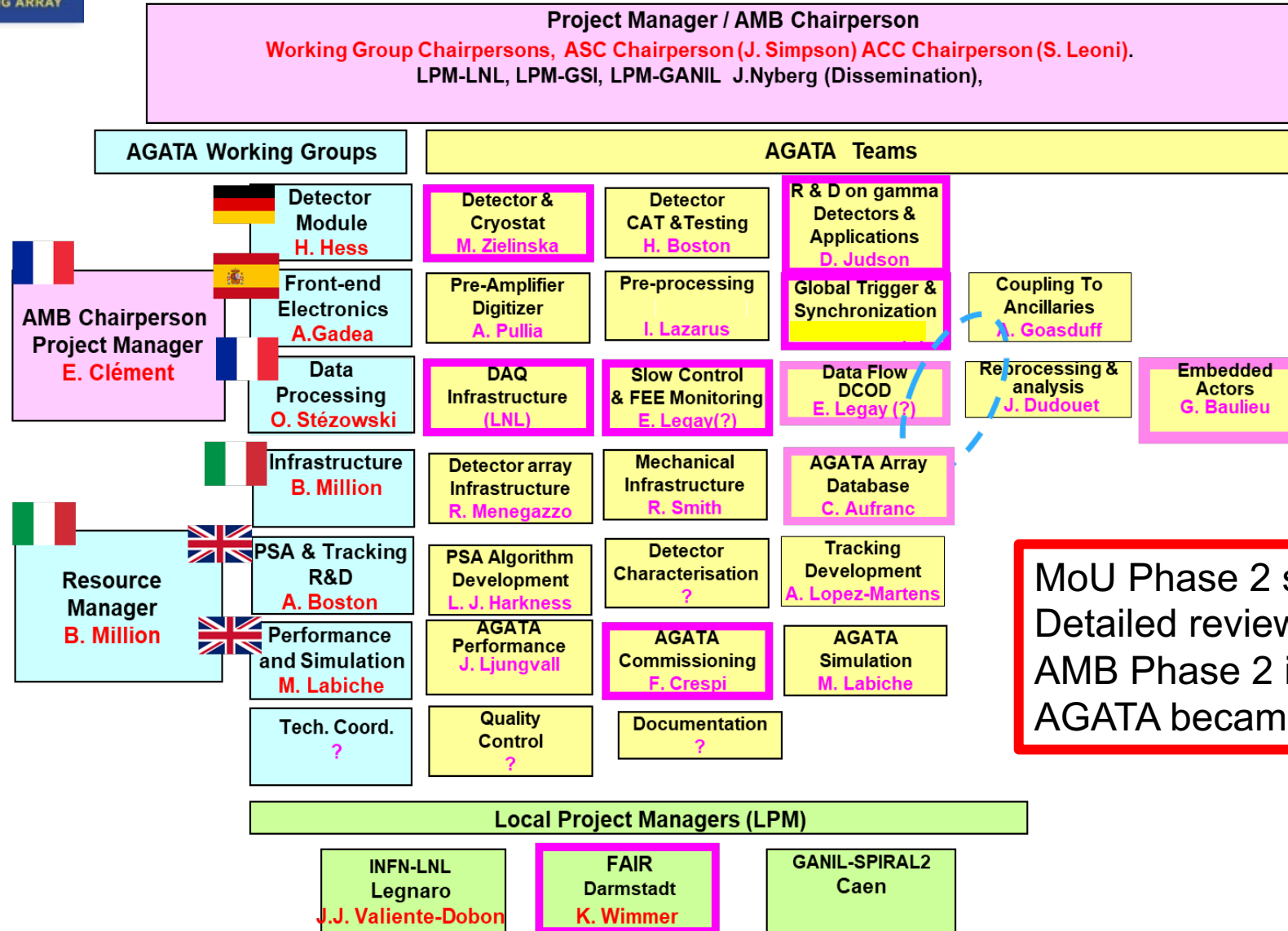
14 034 elog entries



2386 days of LN2 surveillance



11,5 Tons of scientific equipment



MoU Phase 2 signed by major countries  
 Detailed reviews successfully passed in 2020  
 AMB Phase 2 in place  
 AGATA became a « IR » in France

# Detector status

The total number of delivered AGATA capsules is 54

- 1 x in Salamanca for scanning
- 10 x in IPHC Strasbourg for maintenance post GANIL
- 2 x in Liverpool for scanning
- 7 x Mirion for repair(1) + for annealing (6)
- 22 x in Cologne for maintenance post GANIL
- 12 x Legnaro

9 detectors are successful annealed by MIRION

## Cluster Assembly and Maintenance

ATC17: assembly finished by CTT, delivered to Italy week 42

ATC18: assembly finished by CTT, delivered to Italy week 42

ATC01 & ATC07: refurbishment completed, delivered to Italy week 42

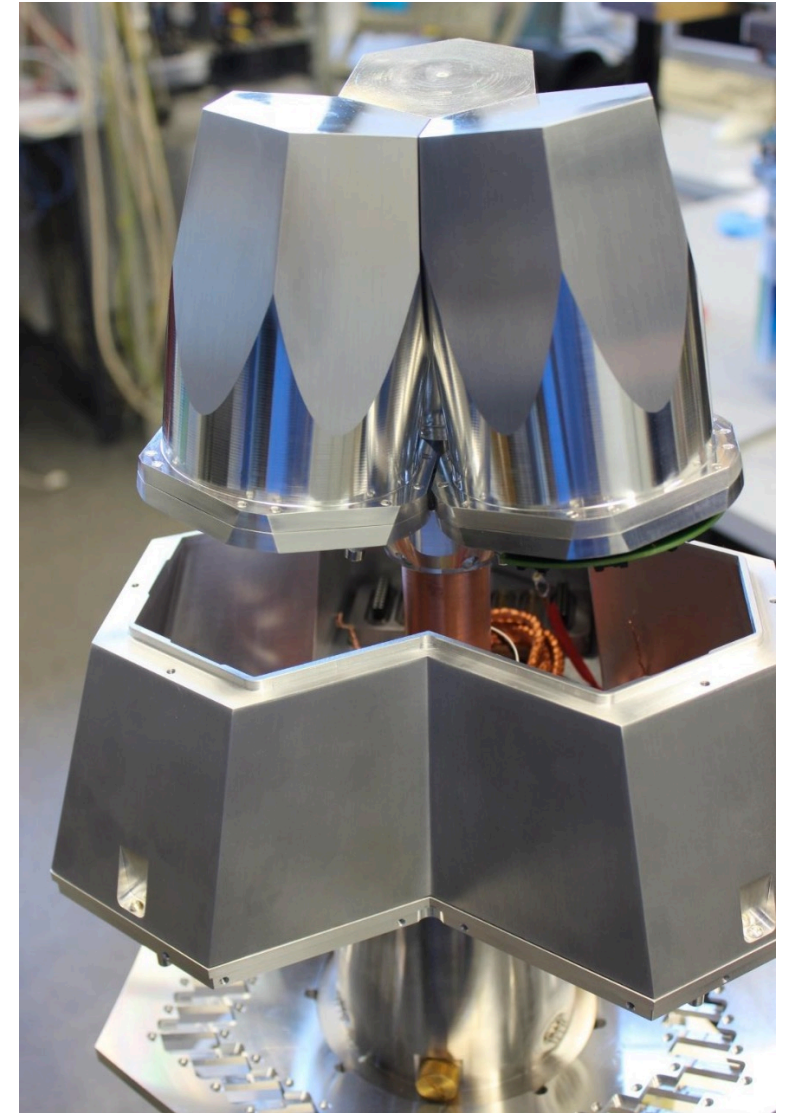
ATC08 equipped with (A006, B013, C006) tests ongoing

ATC06 equipped with new feedthroughs and cabling

ATC05 readjustment of cooling finger

ATC10, ATC11, ATC12 & ATC14 getter annealed, leak tests, tests of the electronics ongoing

→ Early 2022 target is 11(1) ATC in LNL.



# Detector Infrastructures

## Mechanics :

Intense activity in the last week to assemble, align and deliver the  $2\pi$  honeycomb and shaft

Long discussions on the alignment and test procedure



**LVPS:** prototype was tested in AXIS, Saclay and GANIL

**AUTOFILL:** mismatch between LN2 LNL Autofill project and IRFU timing.

→ delivery delayed to 6<sup>th</sup>-17<sup>th</sup> of December

**HV:** New HV system CAEN SY 4527 was bought

→ System available and operation for Christmas

# FEBEE status

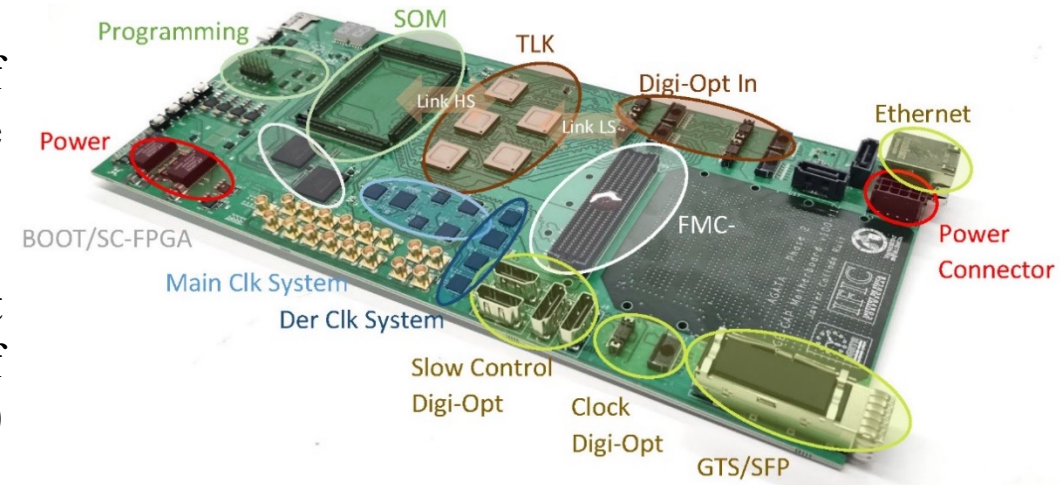
Initially the AGATA collaboration intended to install at least 10 channels of Phase 0 electronics and as much Phase 1 electronics as available for the starting of the AGATA campaign at LNL.

The emergency situation caused by the Sars-Cov-2 pandemic, difficult maintenance after 15 years, and the exclusion of triple coexistence of Phase 0-1-2 cancelled the possibility to start the campaign with the Phase 0 electronics installed.

The situation presently is:

- The Phase 0 electronics will not be installed at LNL
- The 28 channels of Phase 1 electronics belonging to AGATA will be used.
- The GALILEO LNL collaboration will lend 12 DIGIOPT12 Digitizers + 12 GGP to AGATA.
- Delays in the Phase 2 design and prototyping phase

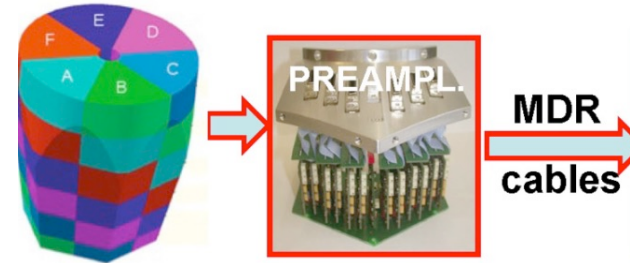
In 2022 there will not be Phase 2 electronics channels (except for test) in the setup  
AGATA will run with 40 channels based on the AGATA Phase 1 + GALILEO loan.



# FEBEE status

The PACE-STARE integration is in progress.  
 10 prototypes Working and tested completely in standalone mode  
 the first version of UDP firmware at 5 Gbps is fully working.

A Development of a 40-Gb/s Readout Interface STARE for the AGATA Project  
[IEEE Transactions on Nuclear Science](#) ( Volume: 68, Issue: 8, Aug. 2021)

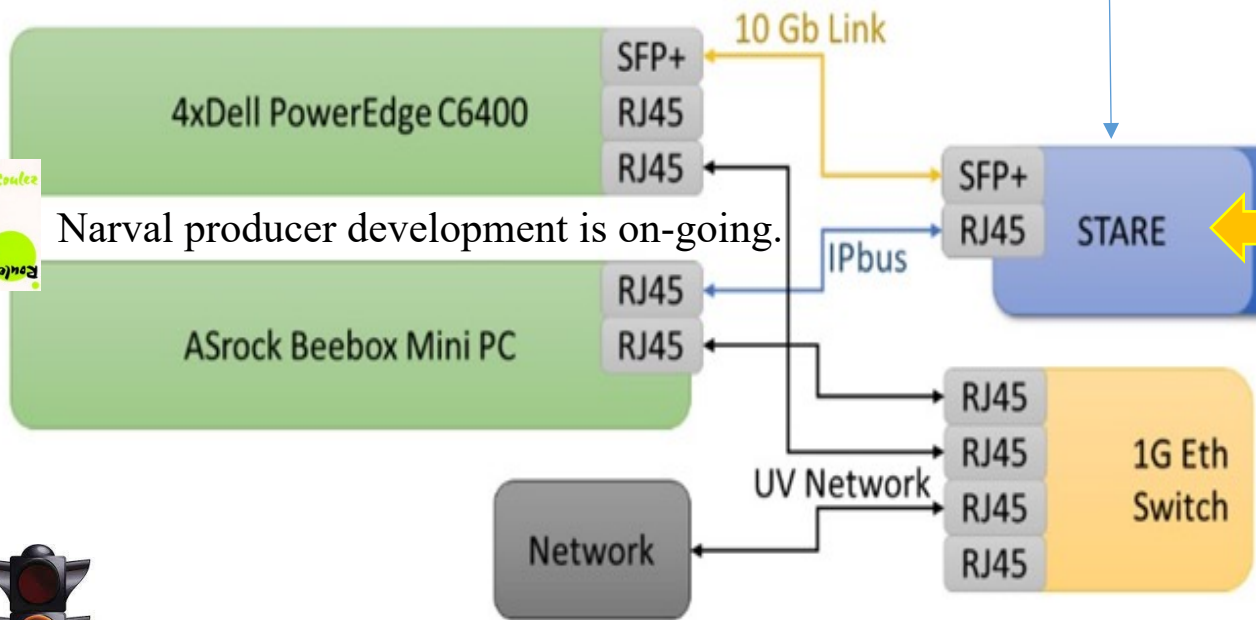


4xDigi-Opt

15 Phase 2 board set delivered  
 ✓ Production level.

- The de-serializer firmware is fully functional.

- PACE Board proto#2 running
- Proto#3 in production, to be tested
- CAP firmware (CERDES, MWD, GTS, RO, EB, SSC)



Narval producer development is on-going.

Aurora link existing  
 Being migrated

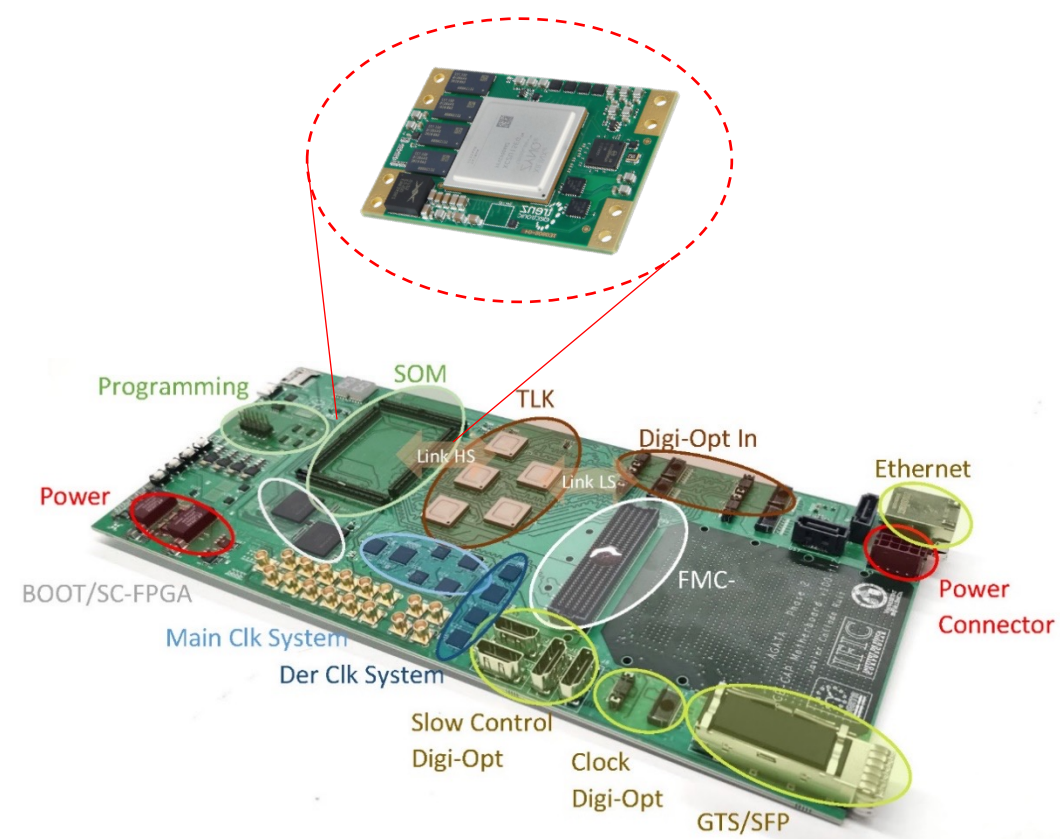
Slow control integration (GEC, python script, ip-bus)





# FEBEE status

- The preprocessing firmware of Phase2 is on the **critical path** of the project due to the difficulties in the firmware team.
- An intense effort is ongoing to minimize the impact of the delays in the preprocessing firmware delivery between the AMB, the local IPHC management and the IN2P3 management.
  - ✓ Mid November milestone for the evaluation of the level of completeness of the firmware
  - ✓ Mid December -decision on the strategy to adopt
  - ✓ Restart the work, (IFIC) in Q1 2022
  - ✓ Reinforced in Q2-Q3 with new personnel at IPHC.
  - ✓ Delivery of prototypes expected Q4 2022



→ Goal is a compatible firmware version with the present Phase 1 within the end of 2022 or early 2023.

- It has been decided to pursue the integration of the phase 2 electronic chain and bootstrapping the preprocessing firmware to collect traces of a capsule with the full chain in November 2021 to verify the overall performances and quality.

# Data flow and Acquisition

<https://agata-elog.ijclab.in2p3.fr:8989/>

Intense work for the LNL preparation

- ❖ A DCOD Virtual Machine has been produced to test the coupling with the XDAQ LNL acquisition system for the coupling with the ancillary detectors.
- ❖ The VM has been receipted and is operational
- ❖ The very first step (readout of electronics) of the coupling AGATA-LNL is currently under investigation

Simple processing chain (Producer/filter/consumer) emulated to study GPU integration  
The filter is based on a Neural Network working on traces

Organization of several meetings to discuss the writing of a Data management Plan (DMP) for the Phase 2.

A very light catalogue of the existing data sets {2010-2021} has been produced

The objective is to bring the so far collected data to the environment foreseen by the Data Management Plan for the Phase2.



# PSA-Tracking R&D



## Liverpool Scanning table

- ❑ A009 scanning
- ❑ ORTEC have supplied the key characteristics (Impurity Gradient etc) for their prototype detector crystal. This will allow the E-field simulation work to commence



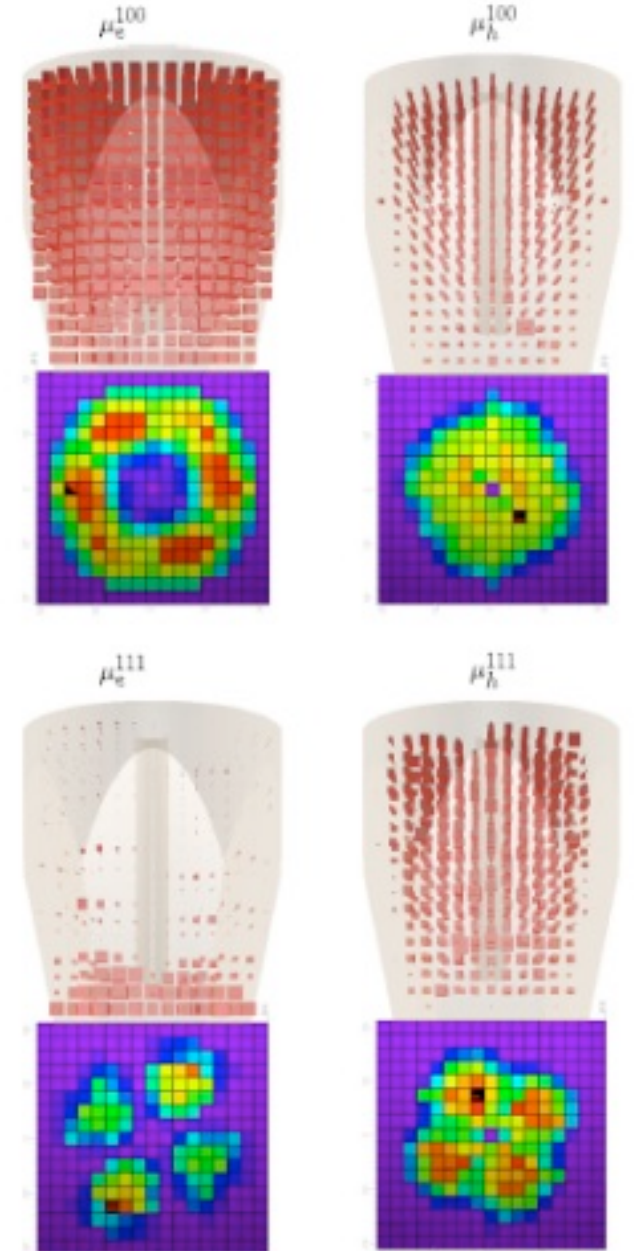
## Strasbourg Scanning table

- ❑ Limited capacity to work at the moment due to other commitments.
- ❑ Expect to be able to receive the A005 detector in late 2021/early 2022.



## Salamanca Scanning table

- ❑ A005 detector mounted in the Salamanca test cryostat was received in early September and commissioning is underway.



Full-volume characterization of an AGATA segmented HPGe gamma-ray detector using a  $^{152}\text{Eu}$  Source ,  
B. De Canditiis, et al, EPJA volume 57, Article number: 223 (2021)

Pulse-shape calculations and applications using the AGATAGeFEM software package  
J. Ljungvall , EPJA volume 57, Article number: 198 (2021)

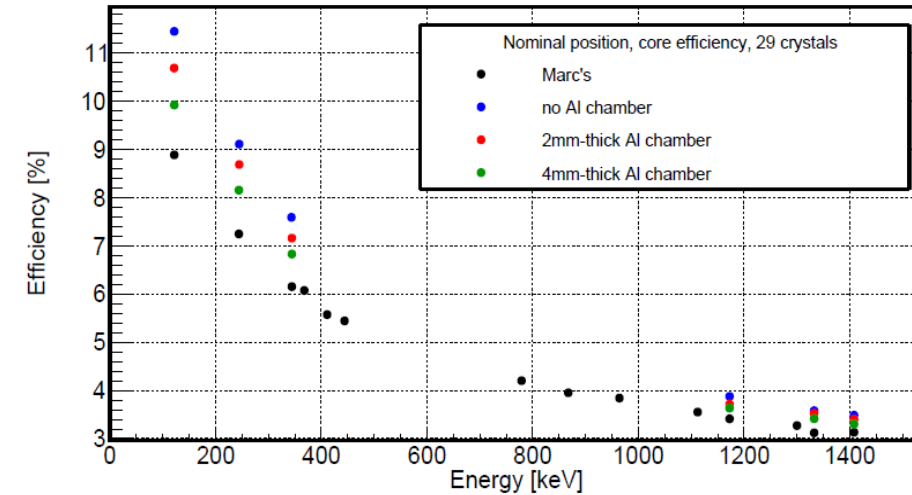
Position uncertainties of AGATA pulse-shape analysis estimated via the bootstrapping method  
M. Siciliano, et al EPJA volume 57, Article number: 64 (2021)

# Simulation, performances and Commissioning

The simulation WG is now meeting on weekly basis to prepare the LNL campaign

On the agenda are:

- The array efficiencies curve at  $\beta=0$  and  $\beta \neq 0$  for 15 and 13 clusters and for two configurations (Nominal and Compact)
- Example of Experiment simulation (AGATA+PRISMA or others)
- Simulation workshop/school (format and earliest date)



AGATA code users have reported a bug in the GEANT4 physics of GEANT4 for Compton events.

For  $\sim 7\%$  of the Compton events, the Compton formula is not satisfied. This is being investigated by the WG. The AGATA physics list is being checked and the WG will make the corresponding Physics list class modular in that process.

A new leader for the Commissioning WG is needed following the departure of Ph. John in the industry sector.

F. Crespi is already involved in this commissioning group at LNL and is appointed

# Dissemination

## - Technical Papers –

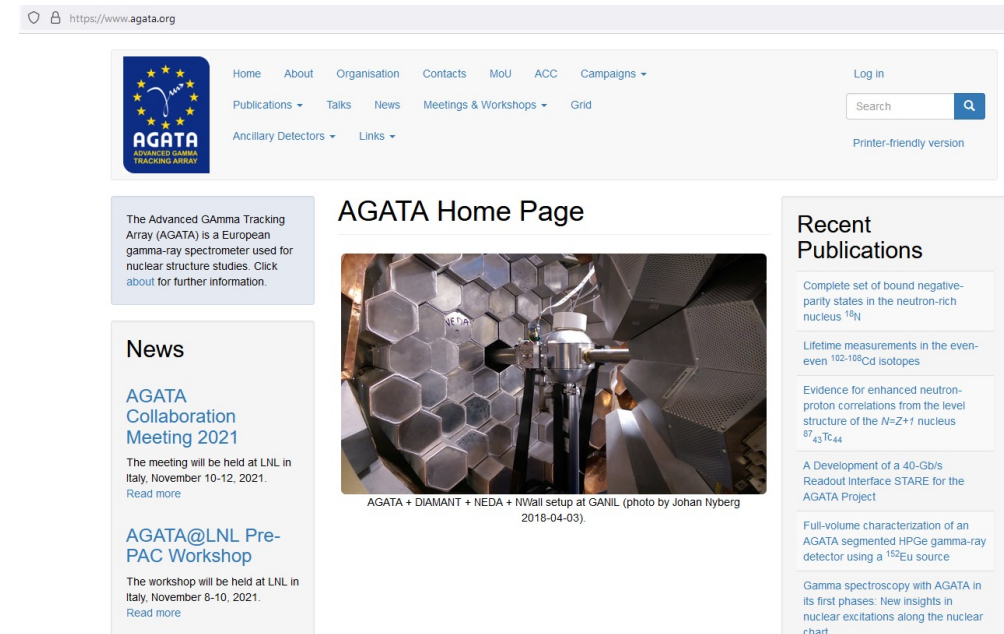
Two technical papers have been published in the framework of the MUGAST campaign :

MUGAST reference paper : <https://doi.org/10.1016/j.nima.2021.165743>

The HECTOR 3He target : <https://doi.org/10.1016/j.nima.2021.165830>

## - Web pages

During the summer 2021 the website of the AGATA Collaboration Council (ACC), which was hosted at STFC Daresbury and managed by John Simpson (JS), was moved to the website <https://www.agata.org/>, which is managed by Johan Nyberg (JN).



The screenshot shows the AGATA Home Page website. The browser address bar displays <https://www.agata.org>. The website features a navigation menu with links for Home, About, Organisation, Contacts, MoU, ACC, Campaigns, Publications, Talks, News, Meetings & Workshops, Grid, Ancillary Detectors, and Links. A search bar and a printer-friendly version link are also visible. The main content area is titled "AGATA Home Page" and includes a description of the Advanced Gamma Tracking Array (AGATA) as a European gamma-ray spectrometer. A "News" section highlights the AGATA Collaboration Meeting 2021 (held at LNL in Italy, November 10-12, 2021) and the AGATA@LNL Pre-PAC Workshop (held at LNL in Italy, November 8-10, 2021). A central image shows the AGATA + DIAMANT + NEDA + NWall setup at GANIL, with a caption crediting Johan Nyberg. A "Recent Publications" section lists several scientific papers, including one on bound negative-parity states in the neutron-rich nucleus  $^{18}\text{N}$ , lifetime measurements in the even-even  $^{102-108}\text{Cd}$  isotopes, evidence for enhanced neutron-proton correlations in the level structure of the  $N=Z+1$  nucleus  $^{87}_{43}\text{Tc}_{44}$ , a development of a 40-Gb/s readout interface STARE, and full-volume characterization of an AGATA segmented HPGe gamma-ray detector.

# Conclusions

The main milestones of the past months are :

- ❑ The GANIL campaign has been completed.
- ❑ The AGATA dismounting has been done according to plan with the involvement of the Working Groups.
- ❑ AGATA has been transferred to LNL according to plan and the local installation has started.
- ❑ The Phase 2 HoneyComb and shaft have been delivered to LNL and installed.
- ❑ The maintenance of the detectors has reached its cruising speed
- ❑ All working groups are working for the LNL installation
- ❑ With the delays of the Phase 2 electronic, it has been decided to rely on the Phase 1 AGATA FEE (DIGOPT12-GGP) and LNL DIGOPT12\_modified-GGP pool to equip a maximum of 40 capsules in 2022 for data taking.

The main points of vigilance for the next months are :

- Consolidate the AGATA organigram
- Provide an updated schedule plan of the LNL installation until the first in-beam commissioning
- Perform a test with detector at LNL of the first complete hardware electronic chain of Phase 2
- The preprocessing firmware of Phase2 is on the critical path of the project
- pursue the integration of the phase 2 electronic chain and bootstrapping the preprocessing firmware to collect traces of a capsule with the full chain early November 2021 to verify the overall performances and quality.
- An intense effort is ongoing to minimize the impact of the delays in the preprocessing firmware delivery between the AMB, the local IPHC management and the IN2P3 management.