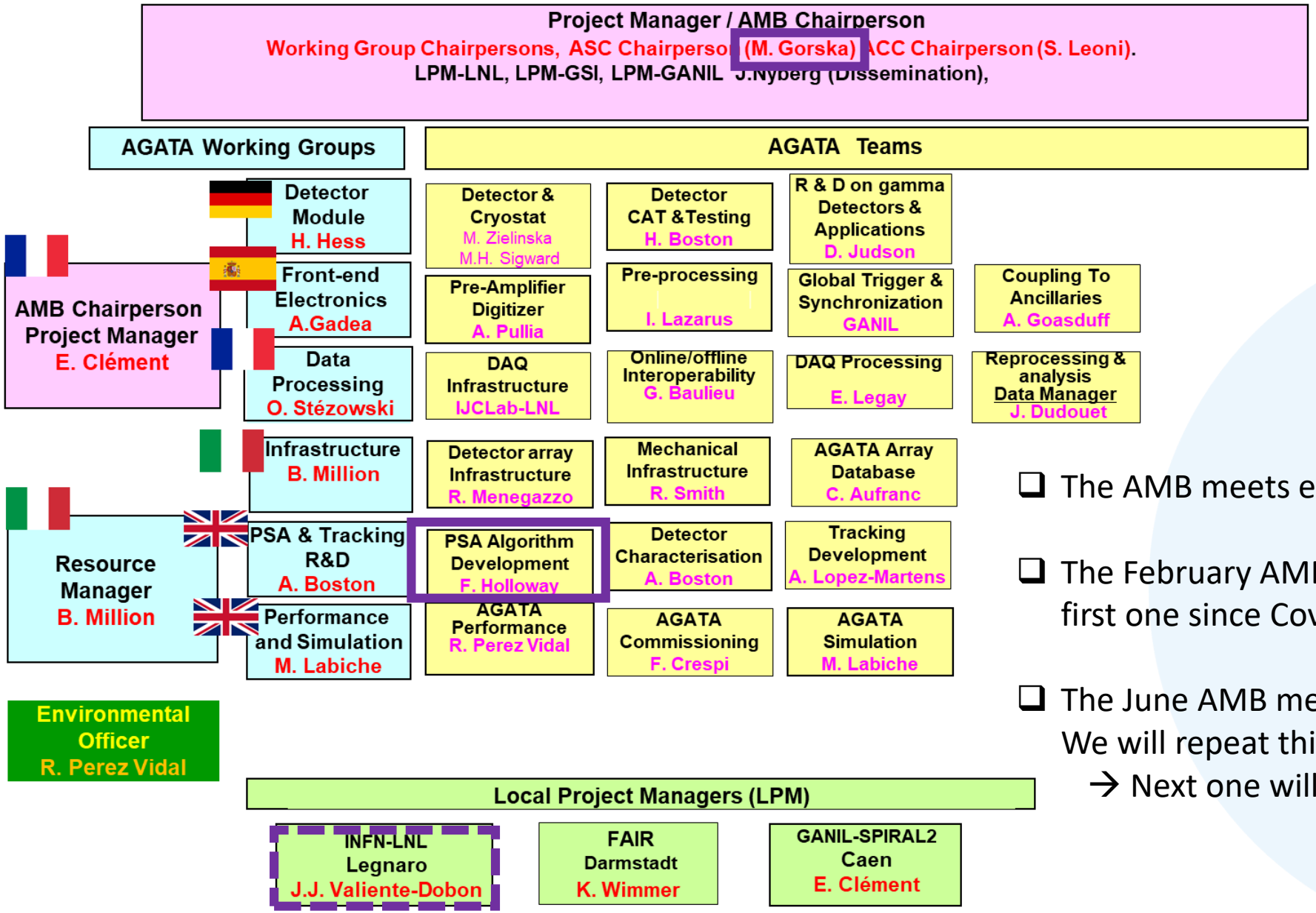
Project Manager Report

Emmanuel Clément (GANIL)
on behalf of the AMB, LNL and Padova local team

2024 AGATA Week - Milano

AGATA Management Board and Teams
Phase 2



- The AMB meets every month by zoom
- The February AMB meeting was in presence in Paris, first one since Covid
- The June AMB meeting included all team leaders. We will repeat this format ~3 times per year
  → Next one will be the December meeting

Project Plan Phase 2

The detailed Project Plan : ATRIUM-563607, ATRIUM-563609

The present project plan, conceived technically for a 4π array, foresees the construction of a 3π array with capital investment from 2021 to 2030, consistent with the MoU,

The production of the Triple Clusters constrains the project

The project plan is based on an annual production of 2-3 Triple Clusters (ordered, produced, assembled and tested)

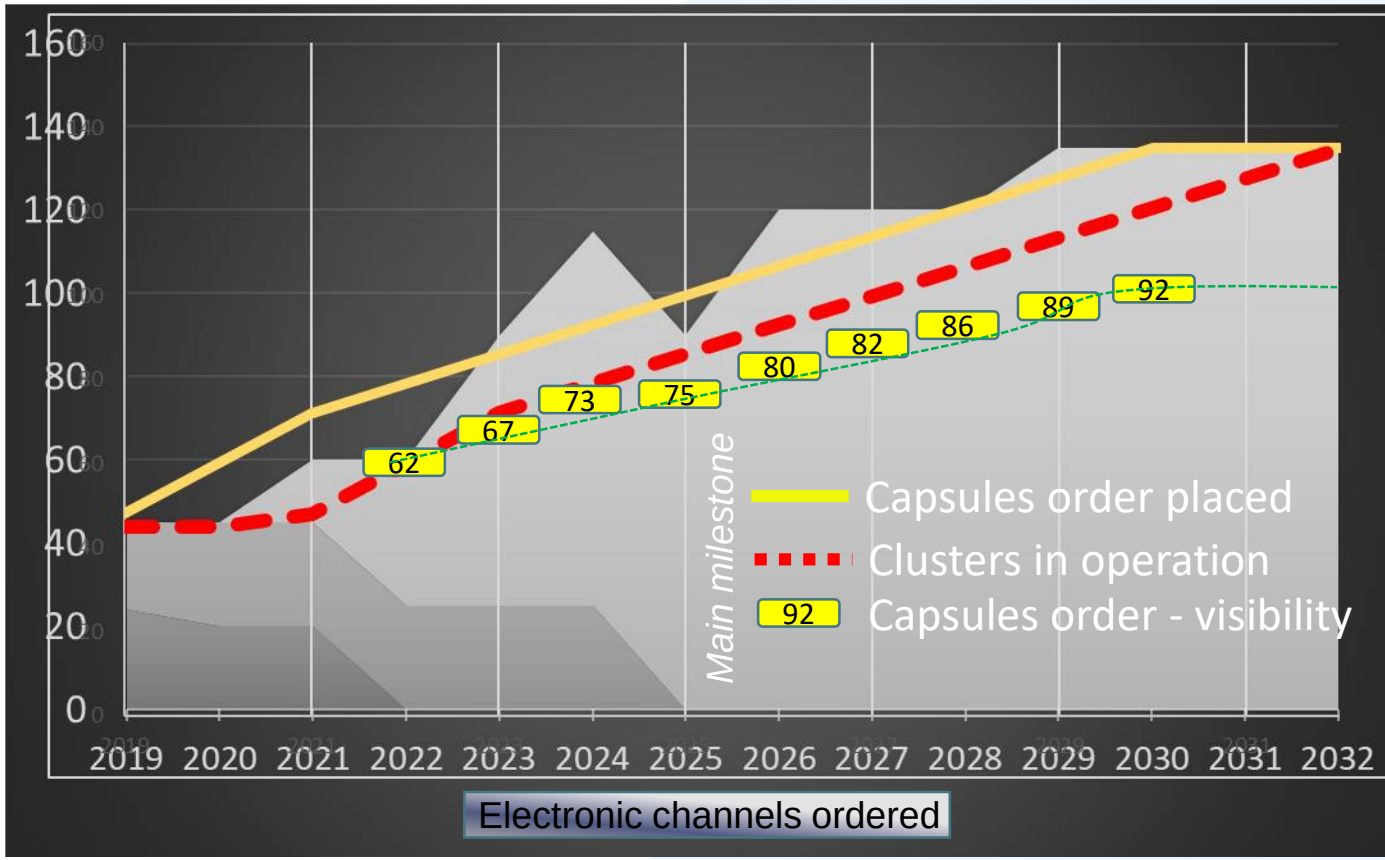
→ A 2π system available by the end of the LNL campaign (>2026) and for the start of the next campaign (SPES, FAIR, GANIL, ISOLDE …)

In 2025, the project will be reviewed by the funding agency to allow the signature of the Phase 2 MoU [2026-2030]

The framework will be defined before Christmas(?) and AMB inputs will be expected by Spring 2025.

Project progresses, budgets, timeline (AMB resp.) and scientific output will be considered

MoU funding scheme (section 3.6)



Topical Issue EPJA : https://epja.epj.org/component/toc/?task=topic&id=1878

The European Physical Journal A
AGATA: Advancements in Science and Technology

Editors : Nicolas Alamanos, Maria Jose Garcia Borge, Angela Bracco, Emmanuel Clement, Andres Gadea, Wolfram Korten, Silvia Leoni and John Simpson

Topical Issue on AGATA: advancements in science and technology

1) Preface
Editors: E. Clement, A. Gadea, S. Leoni, W. Korten

2) Science advancements with AGATA

2.1 Nuclear structure advancements with multi-nucleon transfer reactions
Lead Author: A. Gadea

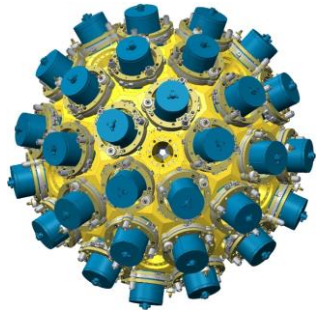
2.2 Nuclear structure advancements with fission
Lead Author: A. Lemasson

2.3 Nuclear structure advancements with fusion reactions
Lead Authors: J. Nyberg, J.J. Valiente-Dobon

2.4 Nuclear structure advancements direct reactions
Lead Authors: W. Catford, D. Beaumel, D. Mengoni

2.5 Nuclear structure advancements with relativistic beams
Lead Authors: M. Bentley, G. Benzoni, K. Wimmer

2.6 Nuclear structure advancements with high energy gamma rays
Lead Author: F. Camera



3) Technical advancements with AGATA

3.1 Mechanical implementations and infrastructures
Lead Authors: J. Simpson, B. Million

3.2 Electronics
Lead Authors: A. Gadea, E. Clément

3.3 Software developments
Lead Authors: O. Stezowski, J. Dudouet

3.4 Detector technology
Lead Authors: *H. Hess, P. Reiter*

4) Performances of AGATA

4.1 Review of the last decade Pulse Shape Analysis activities
Lead Authors: A. Boston, P. Reiter

4.2 Performances of tracking algorithms
Lead Authors: J. Ljungvall, F. Crespi

4.3 System performances under different conditions
Lead Authors: A. Korichi, A. Goasduff

4.4 Simulations of AGATA response and couplings with ancillaries
Lead Author: M. Labiche

4.5 Organization of the collaboration and physics campaigns
Lead Author: E. Clement

Description of all achievement, progresses in hardware, software, performances since the reference NIMA of the collaboration.

For scientific publications making references to the FEBEE and detectors used, PSA/ Tracking/ Monitoring/ Replay/data management used to process the data, simulations and performances, these publications must be cited to showcase the daily work of AGATA team/WG members, including the local teams.

Detector status (9th September 2024)

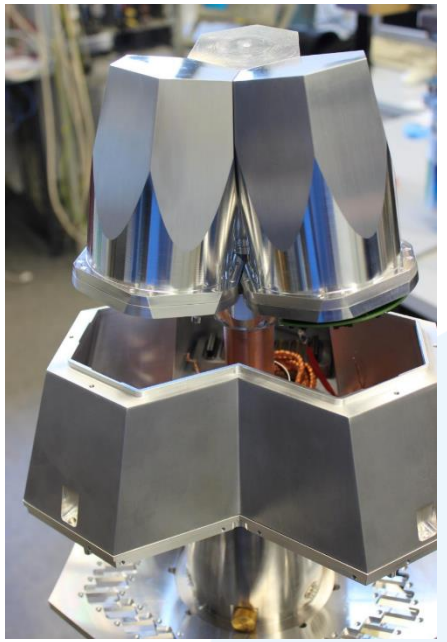
The total number of delivered AGATA capsules is **67**
8 new orders to be placed in 2024 !

Capsules location – July 2024 (IRFU – IPHC – IKP - LNL)

57 capsules assembled in ATC located in LNL

A005 in IPHC→ GSI
B003 in Salamanca

severals capsules on the shelf in IKP
3 symmetric in IKP
ATC22 and ATC23 completed in LNL
A DEGAS ATC completed in IKP



Open Orders: 8 detectors

- 2 x Owner (Italy)
- 3 x Owner (France CEA) delivery expected 2024 (2nd priority)
- 3 x Owner (GSI) must be delivered within 24 (1st priority)

Personnel

- The BMBF budget cut on the AGATA grant is introducing a strong thread on the detector activity at IKP and finally for the AGATA detector working group
- A re-organization is needed at some point

Cluster Assembly and Maintenance

ATC25 order placed by GANIL. One more by GSI (ATC24)
ATC16 (conversion of ADC03 - GANIL): hardware and electronics delivered to Cologne last February
Test cryostats refurbishment

3 capsules to be sent to MIRION for repair (A008 and C017) + one more broken, on its way to MIRION
A006, A008, B005, B009, C001, C014 returned from Mirion for annealing. 12 more in the 2nd half of 2024
Under preparation : a 4 years contract (1.6 M€) between GANIL and MIRION for new orders/ annealing / repairs

Infrastructures

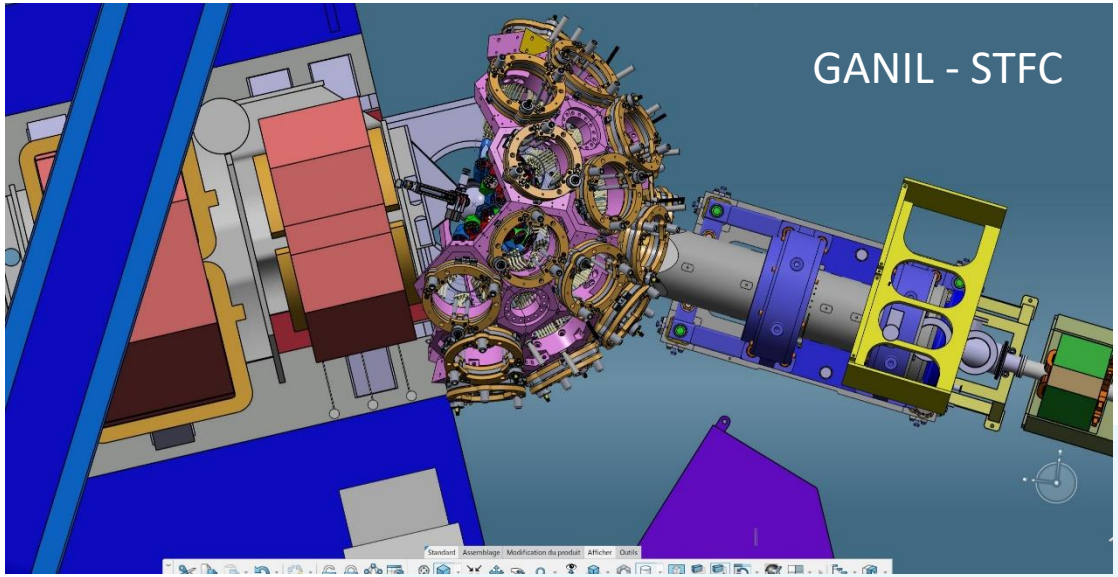
Mechanics :
Involved in the 0° degree change (STFC- LNL – PD)
Involved in the next Host Lab discussion

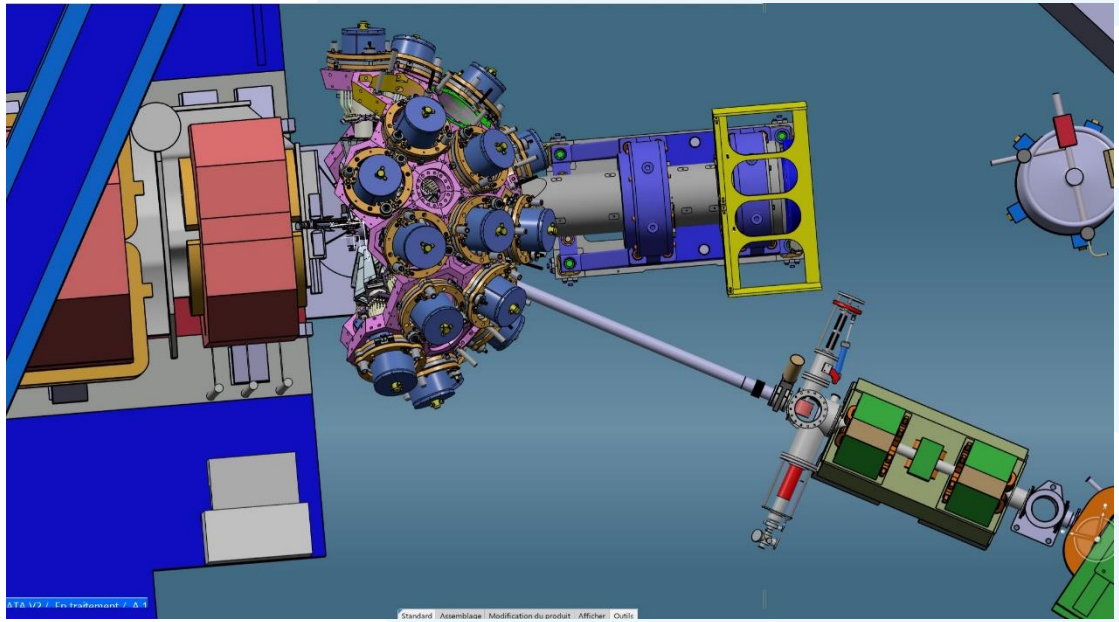
Joined discussion on the EMC (N. Karkour)

Detector Support System (IRFU)

Large activity of maintenance and get the array prepared for the increase of solid angle
Delivery of the 2nd batch of LVPS
2π is covered

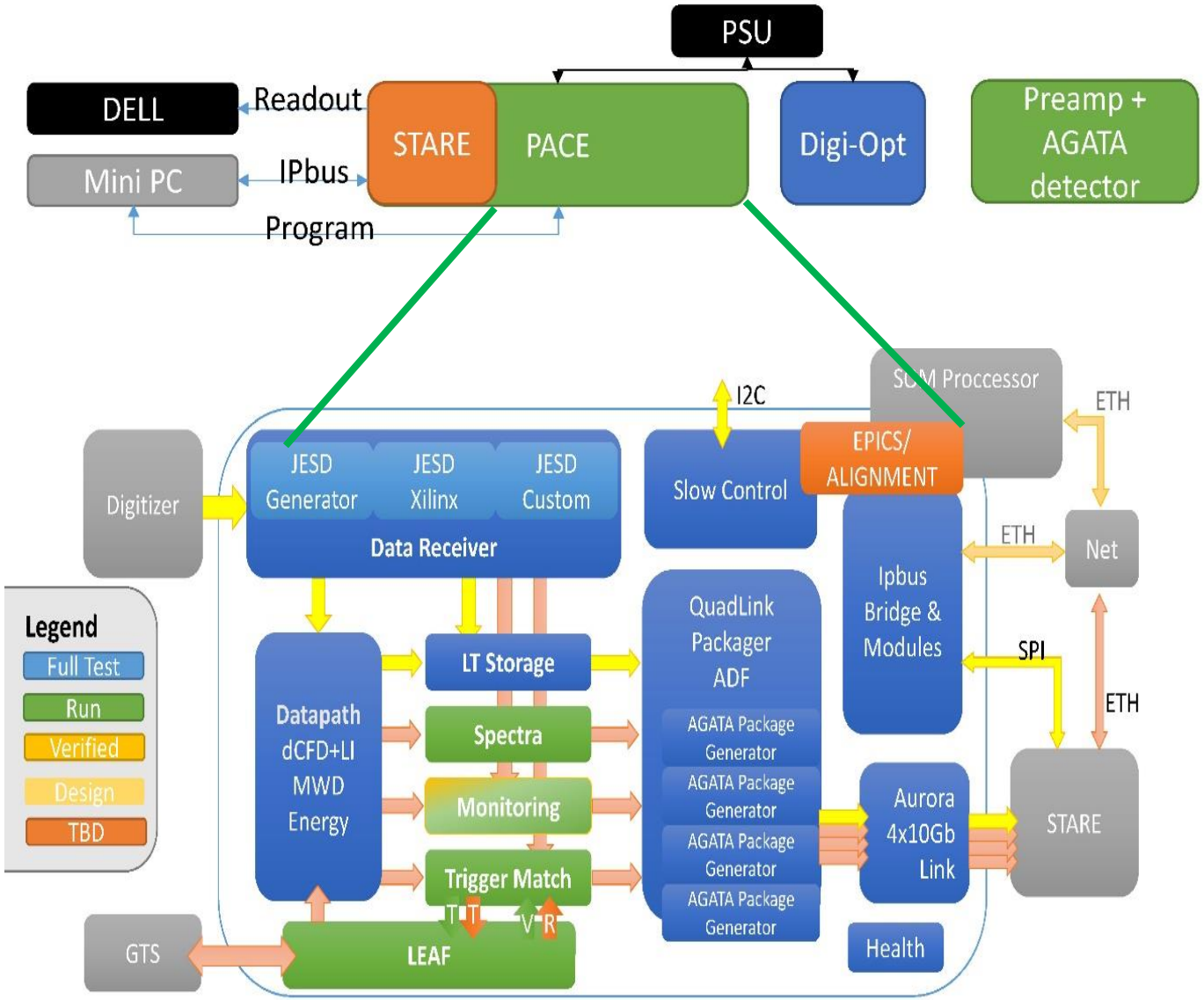
→ 2024 highlight : investment in a “movable/travelling” detector lab’ (pump, baking, etc ..) on top of the mobile test bench ACQ

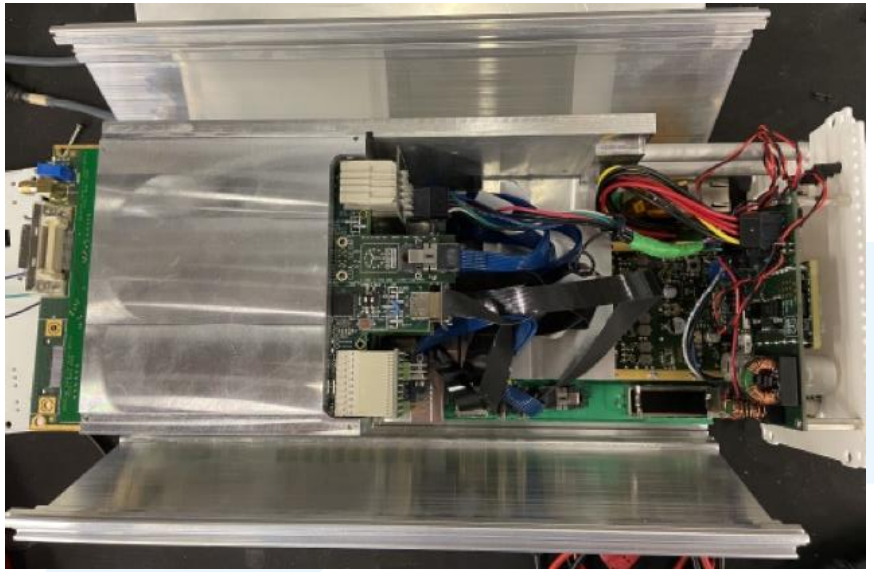




Open issue : final design of GRIT and CryoTarget

Phase 2 FEBEE status





Status of the test bench@LNL

Full data path using an AGATA detector
+ DIGOPT12 (INFN, IFIC)
+ PACE and its firmware (IFIC, GANIL, IPHC)
+STARE (IJCLab)
+readout (IJClab-IP2I)

Phase 2 FEBEE status

Since the last AGATA Week

1. Embedded Linux done
2. GTS → EPICs services implemented.
3. Register mapping and gts_server implemented. *GTS alignment to be completed and GTS validate/reject with TP not yet tested*
4. Acquire a full crystal data set to run the PSA → Several data set sent to Ip2I lyon for checks. Validations on-going (IFIC-LNL-IP2i)
5. Mechanical assembly with cooling completed and checked

6. The full system with PACE, STARE and the Digiopt12 have been commissioned sending data from the 3 transceivers and with no issues with temperature.
7. On 5th of March we agreed to proceed with the production of STARE.
8. On 16th of May, we agreed on the production of the PACE board.
9. Last item is the final version of the processing firmware including the final data packager and GTS implementation (~6 months engineering)
10. SMART dev is on-going; Hardware partially ordered and received

Personnel

Javier left officially the collaboration (‘Univ. of Valencia ’). Still working for the project on very partial time.
Job offer distributed over France, Spain and Italy without success.
The present orientation is to keep the development in Valencia, re-inforce the team as soon as possible and keep the contact with Javier to maintain the development
The HR in FEBEE engineering is critical in the project

For the next months, we put priority in the data packager completion and data integrity check
Next will a discussion on the RUDP with the data flow team
For GTS : setting up a “review” with the GANIL, LNL/Padova, IFIC colleagues to solve the issue of the GTS alignment protocol after data packager is completed

Phase 2 FEBEE Production status

DIGIOPT12 (V3.6, V3.7, V3.71)

54 DIGIOPT12 Core Boards (V3.6) delivered
111 DIGIOPT12 Segment Boards (V3.6) delivered
42 DIGIOPT12 Segment Boards (V3.7 Texas Instruments ADC32J44 flash ADC) delivered
(Ordered 2 core and 6 segment Boards V3.71 September 2024)

STARE Ethernet Interface board

135 STARE boards + Spares Already produced (wrong 100 Ω resistor replaced)
2 STARE boards with SOM (Clock distribution issue being solved before tests)
76 Trenz TE0841 STARE SOM procured
(Ordered 30 Trenz TE0841 STARE SOM)

PACE Pre-Processing Board

~90 PACE PCBs Ordered, delivery scheduled last week October
>50 PACE boards expected to be mounted and tested within 2024 and the rest early 2025
75 Trenz TE0808 PACE SoM procured
(Ordered 30 Trenz TE0808 PACE SoM)

Mechanics, Cabling, Backplanes and PSU

parts for 50 systems mostly completed
PSU for 75 systems to be produced within 2024

Data flow and Acquisition

- Mini daq box for data flow R&D setup in Orsay .
- Preparing the increase of Tb production from the 0° campaign

- Maintaining the present system with upgrades of the CEPH, switches, Analysis machine, anodes, DCOD etc ….
- (note : the IT industry has huge latencies presently)

- Most of the V2 pipe line is ready

- SLC by Ch. Bonin installed in LNL; tests on-going; documentation available
- Great progresses in the oscilloscope software (see Christian's talk)

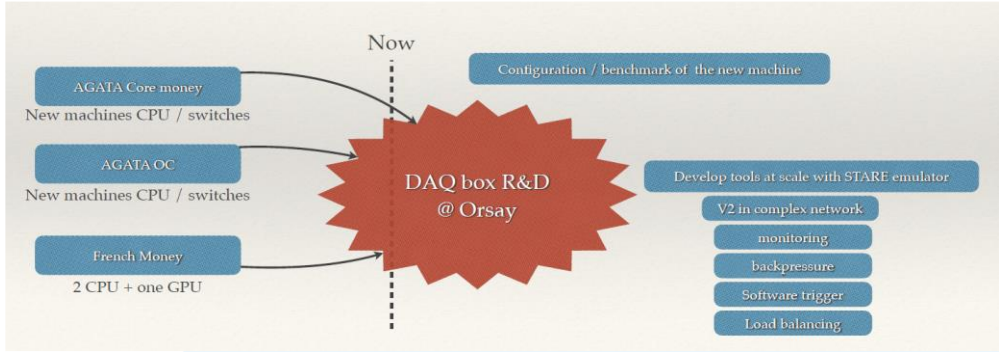
- Both using an V2 emulator and real data taken in LNL (thanks the local team !), stress of the data pipeline

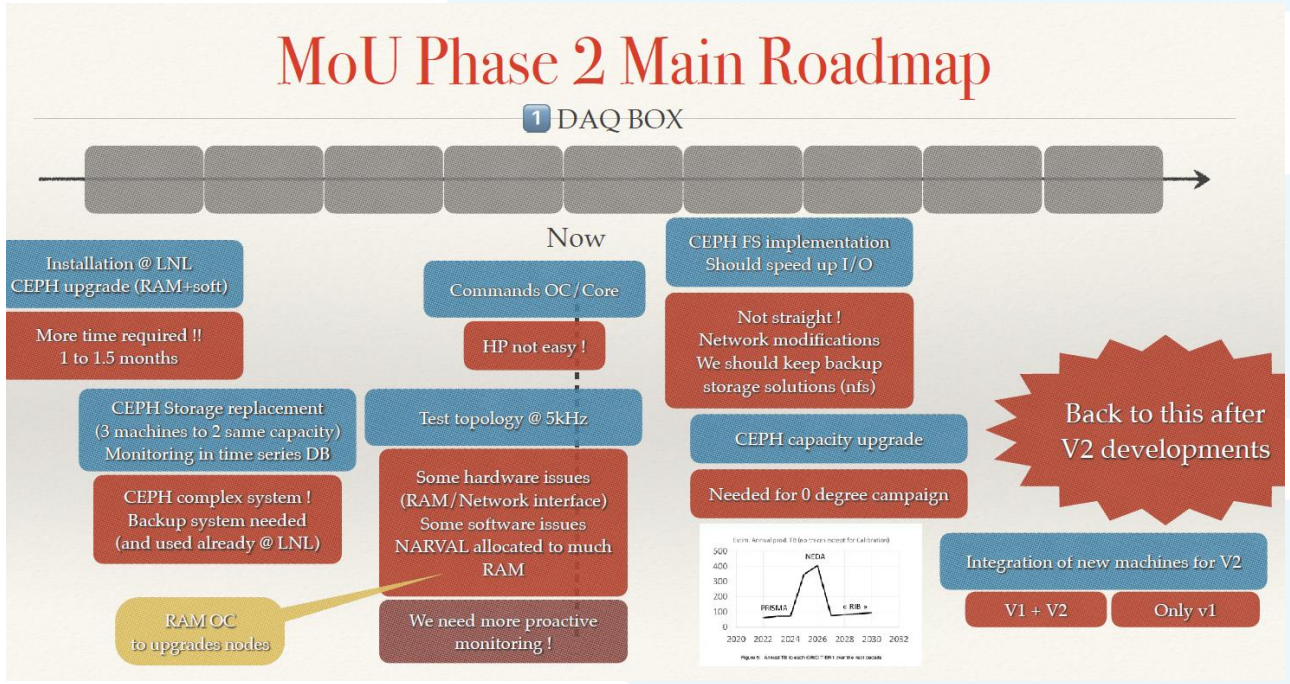
- The data analysis process is part of the WG activities. Steps forward in continues integration, gitlab, updates, FAIRNESS…. Goals are a reliability, easy access to code and data
- Data monitoring : "graphana", Spy, integrity, "big data" management

- Data processing eco-system became a major activity in the WG with respect to phase 1

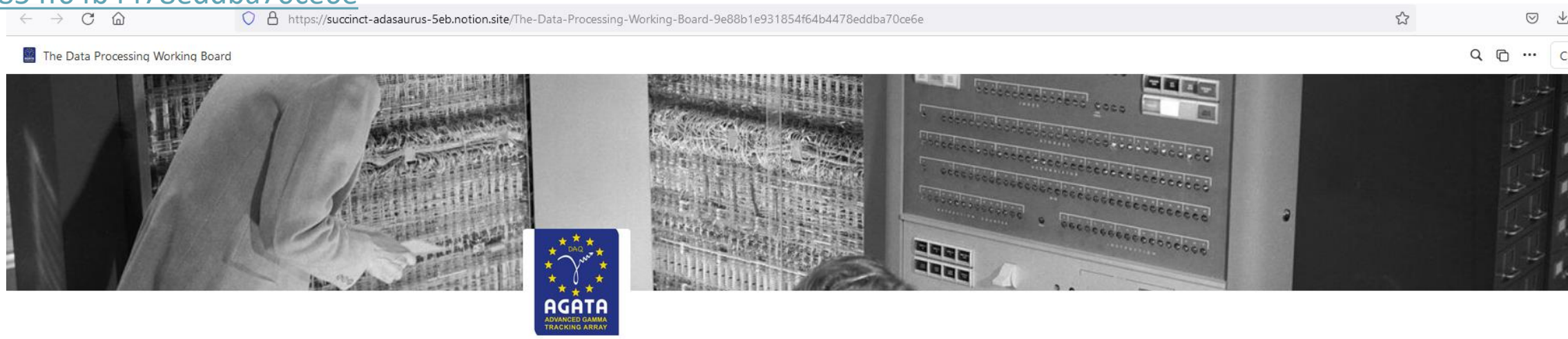
- A fluent collaboration between the WG and the HostLab is crucial

- Improvements in accessing the data from GRID





https://succinct-adasaurus-5eb.notion.site/The-Data-Processing-Working-Board-9e88b1e931854f64b4478eddba70ce6e



The Data Processing Working Board

This page contains information related to the work performed by the Data Processing team

General Links : AGATA - AGATA France
Elog for V2 tests https://gal-serv.lnl.infn.it:20443/Agata+Electronic/
or http://gal-serv.lnl.infn.it:20443/Agata+Electronic/

Breaking News

- a docker to download data from the grid as been set https://agata.pages.in2p3.fr/handbook/data/grid/
- Next AGATA Week in Milano 9-12 September 2024

  Official announcement

  Dear AGATA collaborators,

  We are pleased to announce the next AGATA week in Milan (Italy) from 9th to 12th September 2024 (from noon to noon).

  The indico is online

  https://indico.in2p3.fr/event/32956

  and registrations are open.

  The AGATA Collaboration Council will also be held in Milan (Italy) from 12th to 13th September 2024 (noon to noon).

  The first circular is available at the following address

 September 11, 2023

Road map for AGATA Computing model

O. Stézowski & E. Clément with the AGATA collaboration

Full document ATRIUM-902780

Includes a survey of the present practise

Data flow and Acquisition

Longer term view:

- FAIRifaction process to be continued
  - Data Management and Meta Data Production
  - Catalog
  - GSI/FAIR, GANIL or other host labs specificities with strong Data Management Plan

- Get use of remote processing for offline (GRID, iRod, clouds, data lakes etc …)
- AGATA should collect the result of the final data processing

- How to include AGATA into EOSC is not yet fully clear, either from CCIN2P3 or CNAF via clouds / data lakes …

- !!!!! Keeping the Human Resources at a sufficient level, today mainly in France

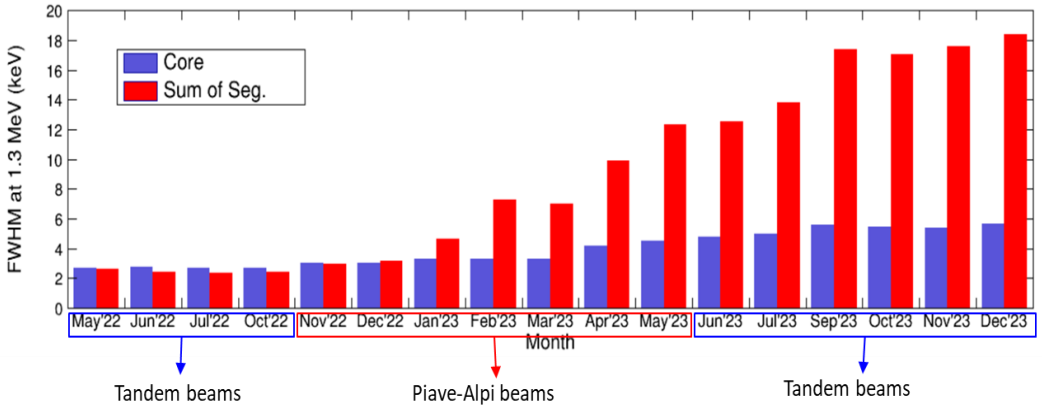
Performances and Simulations

Neutron damage : the report given by the Performance team during the 2023 AGATA week warned the AMB on the present resolution of the array even after the neutron damage correction is applied. The AMB follows carefully the situation.
UK work with un-purpose neutron irradiation; New Post-PSA algo.

18 capsules are already being annealed by MIRION in 2024 (6 done, 6 ready to, 6 to be scheduled).
Operation Cost are fundamental for this operation.

There is no feedback presently for an AGATA or GRETINA like capsule after several annealing in term of loss of performances.
The AMB is in particular investigating a possible strict criterion to help in the decision.

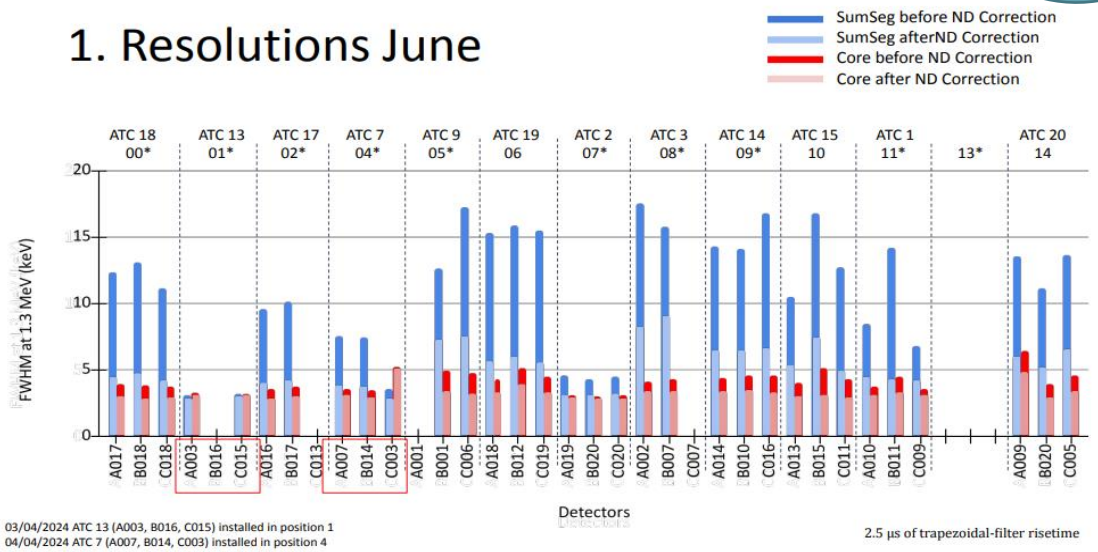
Perf. Report (ie resolution) at each AMB now.



FWHM resolution at 1.3 MeV for the encapsulated detector 00C since the beginning of the AGATA phase II campaign at LNL. The core energy resolution worsened from 2.7 keV to 5.7 kev, while the sum of segments deteriorated from 2.7 keV to 17.9 keV. Note: the measurements were performed by using 6 µs of trapezoidal-filter risetime (May-Oct 2022 and Feb 2023 and Nov 2023) and 2.5 µs of trapezoidal-filter risetime (Nov 2022-Dec 2023).

High energy gamma ray benchmark

Please note that offline PostPSA has better results so it worth to do it extensively at home



PSA-Tracking R&D

Visit to the University of Birmingham Neutron facility took place on Friday 9th Feb. A plan for neutron damaged measurements is now being finalised with A601. (See Christopher's talk). New scanning table commissionning

Strasbourg Scanning table **On the request of AGATA's Performances and PSA Teams, scan of the A005 detector to determine for the first time in 3D various properties of large-volume segmented Ge crystals; strong French involvement in data analysis (IPHC, IJCLab, GANIL, Lyon)**. Full 2x2mm scans have been performed and analysed on NN approach. Reprocessing of the PSA based on NN basis, AGATAGeFEM, ADL. Tomography reports. A step is made with this approach (ie using the scanning table). Much more to come (see talks by Gilbert and Jérémie).

Salamanca Scanning of B003 has been delayed by a problem with the data acquisition losing events, possibly due to the network connection.

PSA-Tracking R&D

Implementation of the multi-interaction PSA grid search using the GRETINA approach : This has been fully implemented in AGAPRO and works.

Implementation of the multi-interaction PSA grid search using SIMPLEX

A secondary algorithm was developed in response to this bias that determines the best optimum linear interpolation of signals rather than their combination. The algorithm, provisionally named SIMPLEX, utilises a similar grid search procedure as used in the GRETINA algorithm but works in an L2 feature space. -- Also here a breakthrough – See Fraser's talk on Tuesday

Other future proposed work

T0 sensitivity of the PSA and how it affects the predictions. PSA could be modified to include the time shift in its search more appropriately, ideally the PSA would search over the full (x,y,z,t) space but that has ramifications on both the execution rate and memory footprint of the PSA:

workshops

OASIS AGATA AI workshop 2024, 13th of May

AGATA – GRETINA in ANL (Nov. 2024)

Tracking report

Investigation into how tracking behaves when the proper position & energy dependent uncertainties are used to estimate the error on the Compton scattered energies

PSA-Tracking R&D

"We choose to go to the Moon!

We ~~choose to~~ go to ~~the Moon~~ in this decade and do the other things, not because they are easy, but because they are hard."

should

a full ML/NN PSA ←→ Tracking flow trained from in-beam data

Capital Ressources

Costs in k€ per year: Expected Cost purchasing 7 to 8 detectors/year (VAT Excluded)

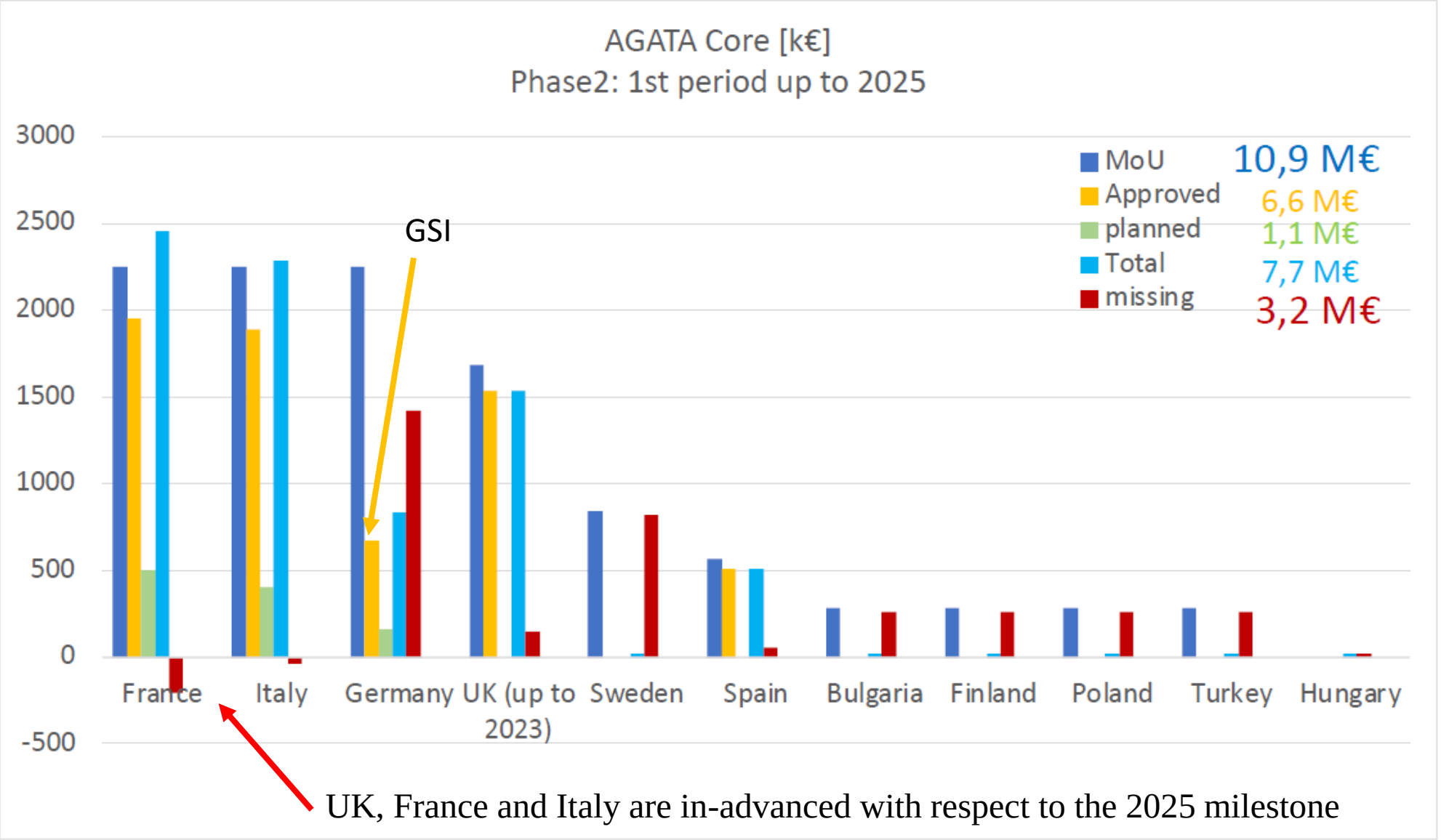
Item	2021 64/21	2022 72/24	2023 80/26	2024 88/29	2025 96/31	2026 104/34	2027 111/37	2028 119/40	2029 127/43	2030 135/45	Total
Detector	1214,5	1357,7	1378,1	1398,7	1419,7	1441,0	1327,9	1540,4	1563,5	1587,0	14228,6
Cryostat	225,1	228,5	338,7	235,4	238,9	354,2	359,5	364,9	370,4	375,9	3091,4
Electronics	0,0	345,8	0,0	0,0	54,3	275,7	372,6	0,0	383,8	0,0	1432,2
Electronics Upgrade	340,7	0,0	438,8	0,0	0,0	0,0	0,0	0,0	0,0	0,0	779,5
GTS/SMART	0,0	0	104,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	104,6
PSA & Data Flow	0,0	157,9	0,0	284,4	52,5	53,3	151,0	48,0	55,7	113,1	915,8
Storage	0,0	117,6	0,0	0,0	0,0	124,9	0,0	0,0	0,0	0,0	242,5
Analysis	0,0	10,5	0,0	0,0	0,0	11,1	0,0	0,0	0,0	11,8	33,3
Infrastructure	461,0	0,0	0,0	266,6	0,0	0,0	0,0	0,0	0,0	0,0	727,7
Mechanics	169,8	0,0	0,0	96,3	10,9	11,1	16,9	17,2	17,4	0,0	339,6
Total	2411,1	2218,0	2260,1	2281,5	1776,4	2271,2	2227,9	1970,5	2390,8	2087,7	21895,2

Detectors procurement represents ~80% of the AGATA Core budget

Discount agreement with Mirion (capsules) :
With an inflation of 2,5%
2022: 6 capsules
215k€/caps → **183k€**/caps
2023: 7 capsules
220k€/caps → **181k€**/caps
2024: 8 capsules
226k€/caps → **178,6k€**/caps

Total estimated cost in 2021: 22 M€

Capital Ressources



	Planned	2021	2022	2023	2024	2025	2021-2025	proposition from MoU - Proj Def contributions 2021-2025	2026	2027	2028	2029	2030	2026-2030	Total 2021-2030	proposition MoU - Proj Def contributions 2021-2030
		64/21	72/24	80/26	88/29	96/31			104/34	111/37	119/40	127/43	135/45			
DETECTORS	Bulgaria	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
	Finland	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
	France	0	4	2	2	0	8	8	3	0	2	2	1	8	16	16
	Germany	0	0	0	3		3	8	0	0	0	0	0	0	3	16
	Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	Italy	0	2	2	2	1	7	8	2	2	2	1	1	8	15	16
	Poland	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
	Spain	0	0	1	0	1	2	1	0	0	0	0	0	0	2	3
	Sweden	0	0	0	0	0	0	3	0	0	0	0	0	0	0	4
	Turkey	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
	UK	3	0	2	1	0	6	6	0	0	0	0	0	0	6	12
	total number	3	6	7	8	2	26	38	5	2	4	3	2	16	42	77
	Increase (1.5%/year)	*1,62%*	*2,50%*	*2,50%*	*2,50%*	*2,50%*			*2,50%*	*2,50%*	*2,50%*	*2,50%*	*2,50%*			
	Full price / Unit	*209,9*	*215,1*	*220,5*	*226,0*	*231,7*			*237,5*	*243,4*	*249,5*	*255,7*	*262,1*			
	effective total price	591,9	1097,2	1265,7	1428,5	469,4	4832,7		1044,8	472,2	908,1	721,1	508,5	3655	8487,5	
	effective price / Unit	197,3	182,9	180,8	178,6	234,7	185,9		209,0	236,1	227,0	240,4	254,3	1167		

It will be an open question to ARRB to delay these 2 orders to save money, ie no orders in 2025 but the production line is full;
AMB hypothesis, 2025 = maintenance with MIRION

Capital Ressources

	Planned	2021	2022	2023	2024	2025	2021-2025	summing MoU - Proj Def contributions 2021-2025
		64/21	72/24	80/26	88/29	96/31		
DETECTORS	Bulgaria	0	0	0	0	0	0	1
	Finland	0	0	0	0	0	0	1
	France	0	4	2	2	0	8	8
	Germany	0	0	0	3		0	8
	Hungary	0	0	0	0	0	0	0
	Italy	0	2	2	2	1	7	8
	Poland	0	0	0	0	0	0	1
	Spain	0	0	1	0	1	1	1
	Sweden	0	0	0	0	0	0	3
	Turkey	0	0	0	0	0	0	1
	UK	3	0	2	1	0	6	6
	total number	3	6	7	8	2	26	38
	Increase (1.5%/year)	*1,62%*	*2,50%*	*2,50%*	*2,50%*	*2,50%*		
	Full price / Unit	*209,9*	*215,1*	*220,5*	*226,0*	*231,7*		
	effective total price	591,9	1097,2	1265,7	1428,5	449,4	4832,7	
	effective price / Unit	197,3	182,9	180,8	178,6	224,7	185,9	
CRYOSTATS	Bulgaria		0	0	0	0	0	
	Finland	0	0	0	0	0	0	
	France	1	0	1	0	2	4	2
	Germany	0	0	0	1	0	1	2
	Hungary	0	0	0	0	0	0	0
	Italy	2	0	0	0	1	3	2
	Poland	0	0	0	0	0	0	
	Spain	0	0	0	0	0	0	1
	Sweden	0	0	0	0	0	0	1
	Turkey	0	0	0	0	0	0	
	UK	1	0	0	0	0	1	2
	total number	3	0	1	1	3	9	10
	Increase (1.5%/year)	*1,50%*	*1,50%*	*25,34%*	*0,00%*	*0,00%*		
	Full price / Unit	*118,5*	*120,3*	*148,5*	*148,5*	*148,5*		
	effective total price	328,8	0,0	148,5	133,6	412,1	1023,0	
	effective price / Unit	109,6	#DIV/0!	148,5	133,6	137,4	113,7	

Equivalent picture of already planned purchases for up to 2025 period

- Great effort to optimise the discount on capsule purchase

- 12 capsules not yet planned
- 1 cryostat not yet planned

Standardisation of specifications for calls for tender

[Capsules : ATRIUM-623168]

[Cryostats: ATRIUM-681055]

Soon for Annealing and repairs

Presently very good collaboration with MIRION

Re-evaluation of the AVERAGE COST OF 1 FULL ATC in Phase 2

No discounts with 1.5% inflation

	average cost over 10y MoU (7/8caps/y)
Item	Cost in k€
Detector (×3)	678,6
Cryostat (×1)	127,5
Electronics (×3) + GTS/SMART	59,9
PSA & DAQ + Storage + Analysis	45,8
Infrastructure	28,0
Mechanics	13,1
Total	952,9
+ Phase 0 & Phase 1 Electronics Upgrade	779,5
Total Cost to reach 45 ATCs including Electronics Upgrade	25555,3
effective unit cost to reach 45 ATCs	**982,9**

discounts with 1.5% inflation

discounts with 2.5% inflation

	average cost over 10y MoU (7/8caps/y)	average cost over 10y MoU + 1y (7/8caps/y) updated in 2024	average cost over 10y MoU + 2y (6/7caps/y) updated in 2024
Item	Cost in k€	Cost in k€	Cost in k€
Detector (×3)	547,3	584,1	610,5
Cryostat (×1)	118,9	138,5	138,5
Electronics (×3) + GTS/SMART	59,1	54,2	54,2
PSA & DAQ + Storage + Analysis	45,8	43,2	43,2
Infrastructure	28,0	16,2	16,2
Mechanics	13,1	15,3	15,3
Total	812,1	851,5	877,9
+ Phase 0 & Phase 1 Electronics Upgrade	779,5	724,5	724,5
Total Cost 45 ATCs including Electronics Upgrade	21895,2	22863,5	23549,9
effective unit cost to reach 45 ATCs	**842,1**	**879,4**	**905,8**

Capital Ressources

Which strategy to complete Phase 2?

Consequence of :

- *price increase and*
- *lower yearly purchase*

on Phase 2 cost
and project duration ?

(Including discount)	Global cost of Phase 2	Unit cost of 1 full ATC today	%	Extra year
1,5%/y 7/8 caps./y	21,8 M€	842 k€		0
2,5%/y 7/8 caps./y	22,8 M€	879 k€	+ 5%	+ 1y
2,5%/y 6/7 caps./y	23,5 M€	906 k€	+ 8%	+ 2y
2,5%/y 5/6 caps./y	24,3 M€	977 k€	+ 16%	+ 4y

- Based on the preparation of the setup with more than 90 capsules in 2027
- But Phase 2 cannot be completed within 2030
- As a consequence, it will be very difficult to reach an average of 7/8 caps./y and the Global cost of Phase 2 will increase:

Capital Ressources – 2024 details

	Plan for Core purchase Within 2024	Still needed for a 90 capsules system within 2025
• **Caspules**	**1.428 k€** = 8*178,6 : 2024: 2-Italy, 2-France, 1-UK, 3-GSI	**2.800 k€**: 12 capsules **137k€:** 1 cryostat
• **Cryostats**	**133 k€** = 1*133 : 1-GSI (ATC25)	
• **FEE**	**69 k€** : 8 full DIGIOPT12, mechanics for electronics	**200 k€** : 25x2 TRENZ boards 60 PACE boards
• **DAQ**	**51 k€** : DAQ – GSI **204 k€** : 40 servers to reach 65 channels (2024)	**80 k€** : storage + analysis 40 services servers (batch 1+2+3) (2025)
• **Infrastructure**		**50 k€**: HV – 10 boards x 8 ch
• TOTAL:	**1.885 k€**	+ **3.267 k€**

We have already invested up to 6,45 M€ since the beginning of Phase 2

OC Ressources – 2024 details

Item	2021	2022	2023	2024	2025
Capsules in setup	57	60	66	75	81
Expected Capsule failures	5	5	5	6	6
failures Under Warranty	1	1	1	2	2
Detectors in setup	19	20	22	25	27
Detectors					
LN2	20	54	59,4	67,5	72,9
Capsule maintenance/repair	224,6	228,0	231,4	234,8	238,4
Detector&Cryostat maintenance/repair	77,6	78,7	87,9	101,4	111,1
Including Preamplifer exchange…					
Other repairs (feedthrough, cabling,…)					
Detector laboratories	60	60	60	60	60
Infrastructure					
HV/LV, Autofill, infrastructure	21,8	21,8	23,9	27,2	29,4
Electronics and DAQ					
Elect. maintenance/replacement	35,1	43,8	40,5	87,7	94,4
DAQ maintenance/replacement	63	63	69,3	78,75	85,05
Other costs					
Grid costs	24	24	24	24	24
Shipping costs	25	25	25	27	27
Mechanics	8	8	8	8	8
Total operation & maintenanc	559,1	606,3	629,4	716,4	750,2

Country	OC funds MoU share (k€)	Funds allocated (k€)
Bulgaria	23	
Finland	27	
France	130	65
		42,9
		22,1
Germany	130	11,7
Hungary	36	36
Italy	130	125
Poland	23	
Spain	36	
Sweden	46	39
Turkey	36	
UK	100	5
Common Accounts		
TOTAL	**717**	**346,7**

OC Ressources – 2024 details

Fixed expenses:

- LN2 (array + Detector lab): 100 k€
- Detector labs: 54,5 k€
- GRID: CNAF 0,5 k€

Priority:

- Cryostat/Preampl. Spare Parts: 58 k€
  test cryostat (IRFU, IKP),
  Spare endcap, spare dewar
- Capsule repairs: 177 k€
  6 annealings
  1 full repair

Maintenance/Replacement:

- Electronics replacement 120 k€
  10 STARE, DIGIOPT12,
  20 TRENZ, GTS NIM carrier, …
- DAQ maintenance: 90 k€
  switches,

Shipping:

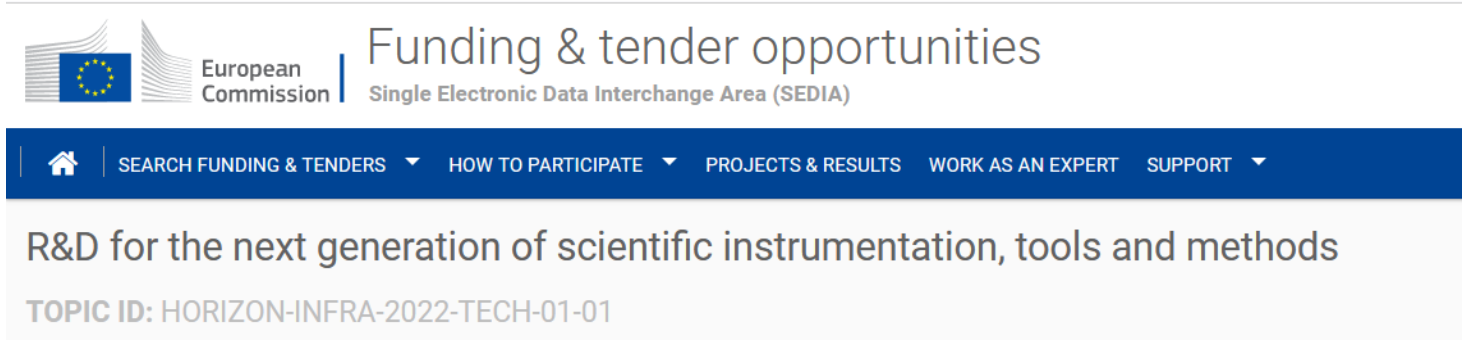
- *Transport* 2 k€

Item	current expenses	Common account expenses expenses	planned current expenses	planned accumulated expenses
Detector & Infrastructure				
LN2	0,000		100,000	
Capsule maintenance/repair	0,00	0,00		177,00
Cryostat maintenance/repair	0,000		58,000	
HV/LV system, infrastructure	0,000	0,77		
Detector laboratory (consummables etc.)	50,000		4,500	
Electronics & DAQ				
Electronics maintenance/repair	0,000	0,000		120,000
DAQ maintenance/repair	0,000		90,000	
Other costs				
Grid costs + Data Analysis	0,000		0,500	
Shipping costs		0,00	2,00	
Mechanics etc.				
Total operation & maintenance costs (excl. personnel)	**50,000**	**0,769**	**255,000**	**297,000**
		50,769		**552,000**

Total expenses up to now 50,8 k€
Planned expenses 552 k€
For a total of 602,8 k€

Horizon 2020

HORIZON-INFRA-2022-TECH-01-01



IMATRA2 - IMAging and TRAcking of radiation for science and society

P.I Paul Greenless (Uni. Jyvaskyla)

AGATA Propositions in this application (~5 M€) out of a total of ~9.7 M€

REJECTED

•Research and development of new passivation and contact technologies for p-type High Purity Germanium detectors from coaxial to highly segmented crystals toward industry (WG – Detector – INFN-CNRS-MIRION)
•Research and development of new cryostat technologies for large volume High Purity Germanium for reliable operation in high radioactivity environment (ESFRI Facilities) (WG – Detector – IKP- CTT)
•Research and development of a cryogenic ASIC – Flash ADC system suitable for high resolution gamma rays spectroscopy (INFN-IFIC-CNRS- CEA)
•Validation and manufacturing a prototype including all the new technologies for the European AGATA (Advanced Gamma Tracking Array) spectrometer (www.agata.org) (ALL)
* Step down in the AI/ML and data flow parts since they have been funded by national grant

We should « saucissonner » the differents R&D funding requests
→ See HPGe current initiative

The AMB will of course helps as much as possible.

Thanks to all AGATA contributors ++ The local team LNL/PD

and Milano for the AW organisation