



# The Fifth AGATA Week

15-18<sup>th</sup> January 2007

Orsay

Welcome and Status

John Simpson

Nuclear Physics Group, Daresbury Laboratory

# AGATA WEEK

## Concept:

ALL AGATA teams to meet

ALL to be present throughout the week if possible

Travel, information exchange, overlap of tasks between groups

Detailed funds and planning

Project reaching crucial phase.

Teams meeting as and when necessary.

Further AGATA weeks?

Format?

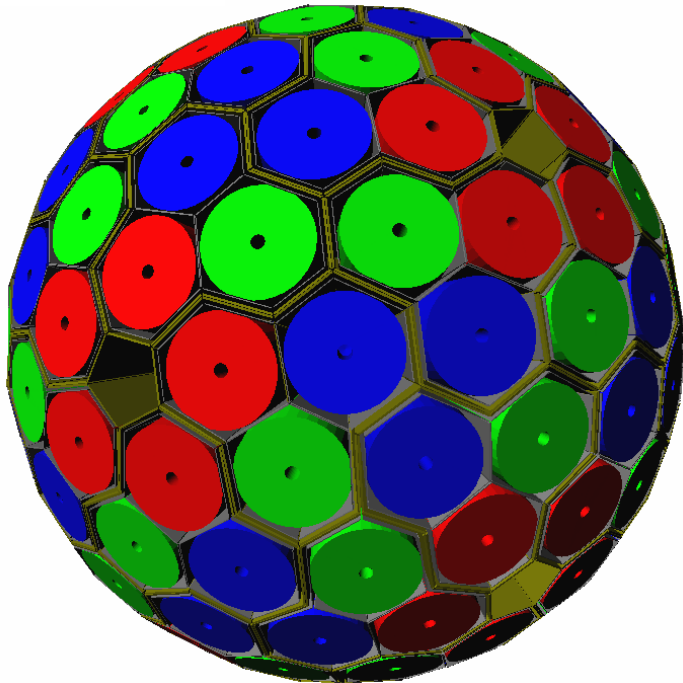
Comments to members of the AMB



# AGATA

(Advanced GAMMA Tracking Array)

$4\pi$   $\gamma$ -array for Nuclear Physics Experiments at European accelerators providing radioactive and high-intensity stable beams



## Main features of AGATA

**Efficiency:** 43% ( $M_\gamma=1$ ) 28% ( $M_\gamma=30$ )  
today's arrays ~10% (gain ~4) 5% (gain ~1000)

**Peak/Total:** 58% ( $M_\gamma=1$ ) 49% ( $M_\gamma=30$ )  
today ~55% 40%

**Angular Resolution:**  $\sim 1^\circ \rightarrow$   
FWHM (1 MeV,  $v/c=50\%$ )  $\sim 6$  keV !!!  
today  $\sim 40$  keV

**Rates:** 3 MHz ( $M_\gamma=1$ ) 300 kHz ( $M_\gamma=30$ )  
today 1 MHz 20 kHz



- 180 large volume 36-fold segmented Ge crystals in 60 triple-clusters
- Digital electronics and sophisticated Pulse Shape Analysis algorithms allow
- Operation of Ge detectors in position sensitive mode  $\rightarrow$   $\gamma$ -ray tracking

# AGATA Organisation

## AGATA Steering Committee

Chairperson J.Gerl, Vice Chairperson, W.Korten (and EURONS)

G.deAngelis, A.Atac, F. Azaiez, D.Balabanski, D.Bucurescu, B.Cederwall,  
J.Jolie, R.Julin, W.Meczynski, P.J.Nolan, M.Pignanelli, G.Sletten, P.M.Walker

## AGATA Management Board

J.Simpson (Project Manager)

D.Bazzacco, G.Duchêne, P. Reiter, A.Gadea, R.Krücken, J.Nyberg

## AGATA Working Groups

<b>Detector module</b> P.Reiter	<b>Detector Performance</b> R.Krücken	<b>Data Processing</b> D.Bazzacco	<b>Design and Infrastructure</b> G. Duchêne	<b>Ancillary detectors and integration</b> A.Gadea	<b>Simulation and Data Analysis</b> J.Nyberg
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## AGATA Teams

<b>Detector and Cryostat</b> A. Linnemann	<b>PSA</b> R.Gernhaeuser/ P.Desesquelles	<b>Digitisation</b> P.Medina	<b>Mechanical design</b> K.Fayz/J.Simpson	<b>Elec. and DAQ integration</b> Ch. Theisen	<b>Gamma-ray Tracking</b> A.Lopez-Martens
<b>Preamplifiers</b> A.Pullia	<b>Detector Characterisation</b> A.Boston	<b>Pre-processing</b> I.Lazarus	<b>Infrastructure</b> P.Jones	<b>Devices for key Experiments</b> N.Redon	<b>Physics &amp; expt. simulation</b> E.Farnea
		<b>Global clock and Trigger</b> M.Bellato	<b>R &amp; D on gamma Detectors</b> D.Curien	<b>Impact on performance</b> M.Palacz	<b>Detector data base</b> K.Hauschild
		<b>Data acquisition</b> X.Grave		<b>Mechanical Integration</b> J. Valiente Dobon	<b>Data analysis</b> O.Stezowski
		<b>Run Control &amp; GUI</b> G.Maron			

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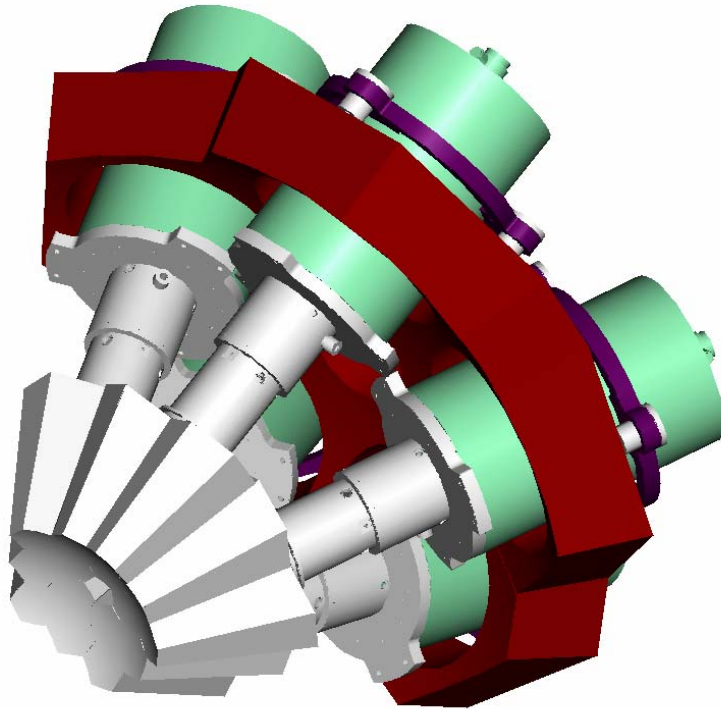
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# The First Step: The AGATA Demonstrator

## Objective of the final R&D phase 2003-2008



1 symmetric triple-cluster  
5 asymmetric triple-clusters

36-fold segmented crystals

540 segments

555 digital-channels

Eff. 3 - 8 % @  $M_\gamma = 1$

Eff. 2 - 4 % @  $M_\gamma = 30$

**Full ACQ**

with on line PSA and  $\gamma$ -ray tracking

**Test Sites:**

GANIL, GSI, Jyväskylä, Köln, LNL

**Cost ~ 7 M €**

# Funding

Capital for the demonstrator  
From France, Germany, Italy,  
Sweden, Turkey and UK

Latest estimated cost  
Demonstrator  
(3 sym + 15 asym.)

	k€ ex tax
Detectors	4033
Electronics	1378
DAQ	287
D&I	103
Ancillaries	24
Data analysis	20
Total	5844

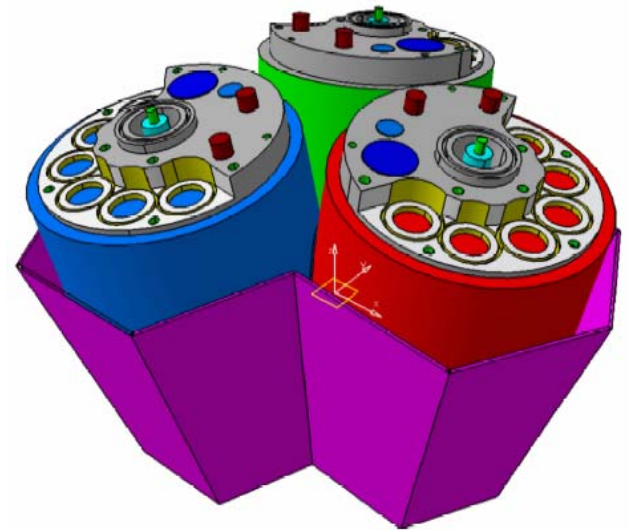
**15 + 3 detector system possible (just)**

# The AGATA RESEARCH and DEVELOPMENT PHASE

- Develop 36 fold segmented encapsulated detector of right shape
- Develop cryostat for groups “clusters” of these detectors
- Develop digital electronics (700 channels)
- Finalise signal algorithms for energy, position and time
- Develop tracking algorithms
- Build demonstration unit to **prove tracking in real situations**
- Write technical proposal for full array

# AGATA Detectors

- Symmetric detectors
  - 3 delivered
- Asymmetric detectors
  - 15 ordered
- Triple cryostats
  - 3 (soon 4) ordered
  - 1<sup>st</sup> expected May
- Test cryostats
  - 3 delivered
  - 2 ordered (expected soon)
- Preamplifiers
  - Core (cologne) Segment (Ganil, Milano) working



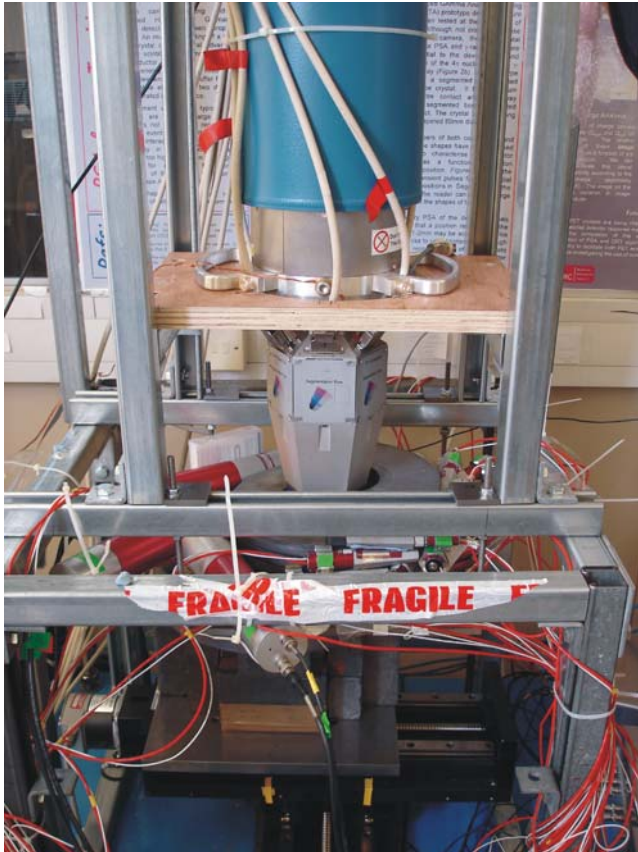
# Asymmetric detector acceptance test summary

Detector	delivery	Owner	Status
A001	11/05	France	rejected
B001	11/05	Italy	rejected
C001	12/05	Italy	accepted
A002	04/06	Germany	rejected
A001*	06/06	France	accepted
C002	07/06	France	accepted
B002	08/06	France	accepted
A003	11/06	UK	in test

Further 7 in first half of 2007

# Characterisation and Scanning

Two symmetric capsules scanned in Liverpool



Currently one (capsule + test cryostat) at Padova, Orsay/Saclay, GSI

Commissioning of further scanning systems at Orsay and GSI

Scan of an asymmetric capsule in Liverpool

4<sup>th</sup>/5<sup>th</sup> test cryostats will help scheduling

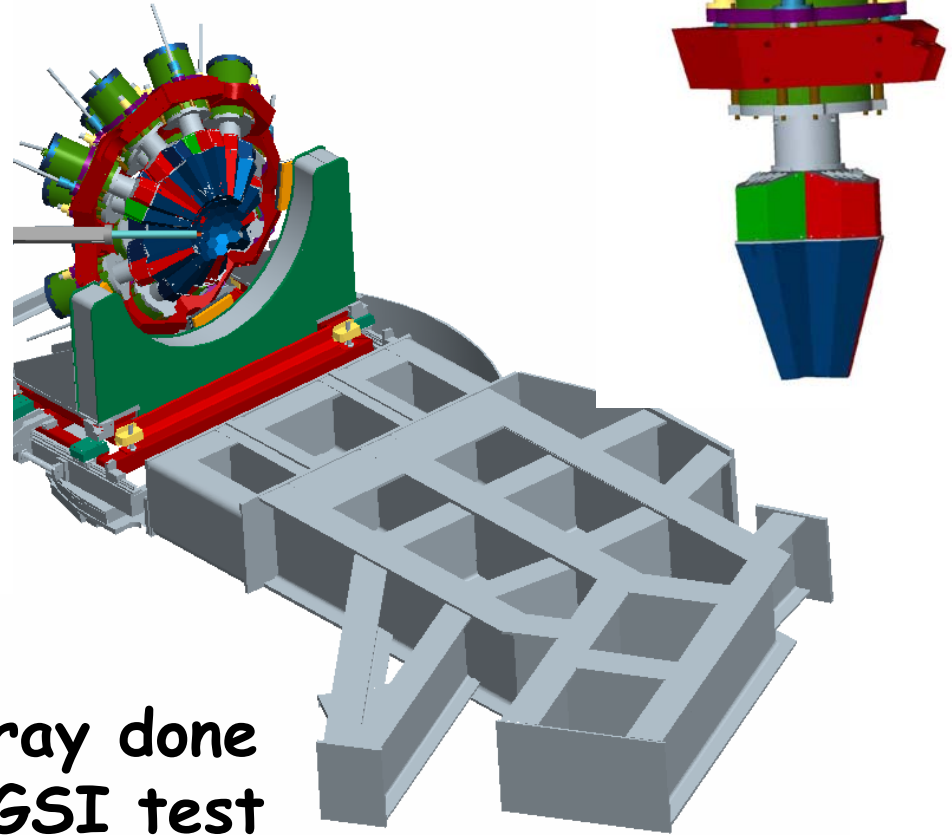
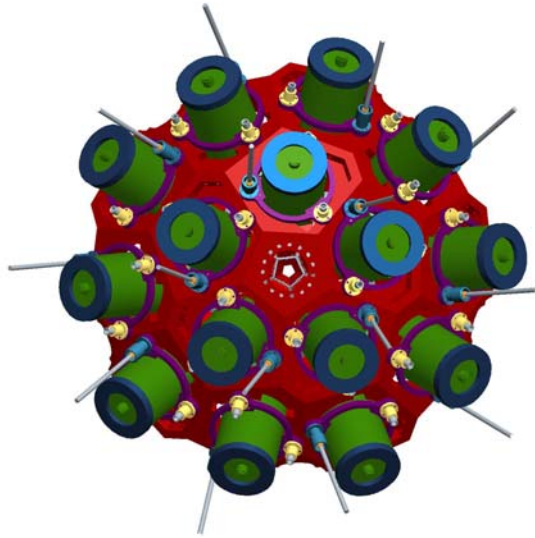
Due April 2007

Scan of the 3<sup>rd</sup> symmetric capsule

Test with electronics

Asymmetric cryostats due by May 2007

# AGATA Design and Construction



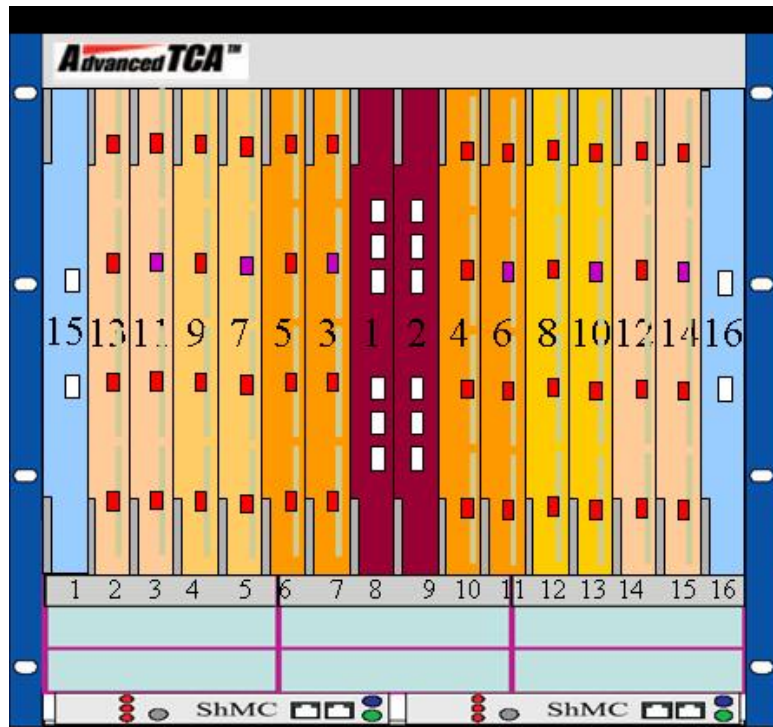
180 geometry defined  
Conceptual design of 180 array done  
Details of HV etc. agreed, GSI test  
Design of AGATA demonstrator for LNL final stages  
Flanges manufacture started  
Assembly in LNL, 2007

# Digitiser module

- Testing in Liverpool December 2006
- Production in progress
- Orders place for 15 modules



# Pre-processing modules (E,T, hits, ...)



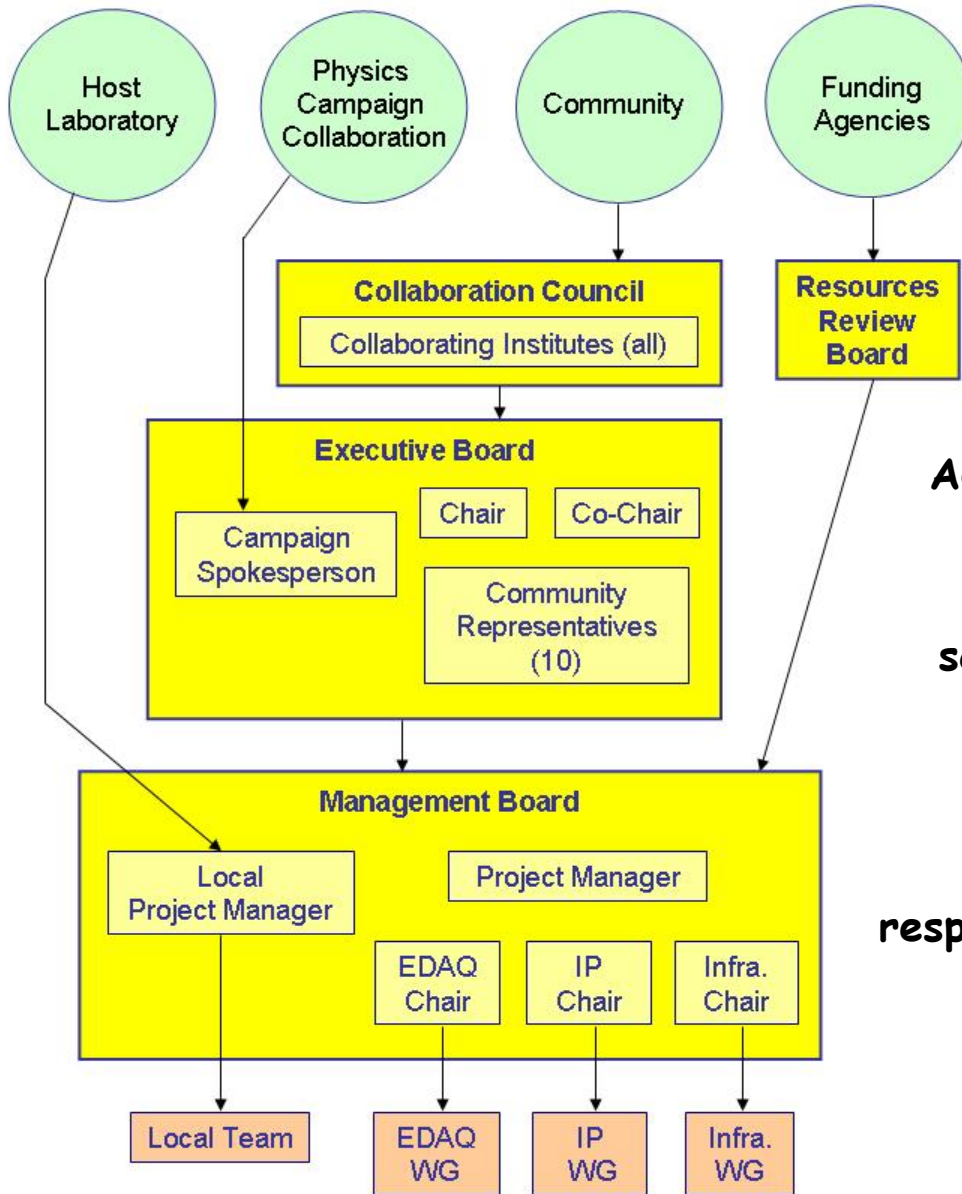
- Since Liverpool meeting
- Prototypes tested
- Core digitizer to core mezzanine and carrier communication tests
- Problems found
- Redesign of carrier started Nov
- Redesign of mezzanines December
- Delay in production cards

# Status of the AGATA project

- Next steps
  - Build up triple detector (s)
  - Continue Ge detector characterisation
  - Pulse-shape analysis algorithms optimised
  - Gamma-ray tracking algorithms optimised
  - Electronics and DAQ prototypes and production
- Demonstrator ready by end 2007, early 2008 ???
- First physics campaign at Legnaro in 2008
- Further campaigns (2009...) at GANIL, GSI, (ILL)

# Status and Evolution

- Demonstrator ready in 2008
- Next phases discussed in 2005-2007
- New LoI for construction phase 2005
- New MoU and bids for funds in 2007
- New organisational structure
- Start construction in 2008,  $1\pi$  in possible in 2011
- Rate of construction depends on production capability
- Stages of physics exploitation, facility development
- FP7



**Note: Not yet agreed  
To be discussed at ASC tomorrow**

**ARRB representing funding agencies**

**ACC representing all collaborating institutes**

**AEB responsible for the  
science policy, project coordination**

**AMB  
responsible for the execution of the project.**

Talks from this *AGATA* week:

<http://www-csnsm.in2p3.fr/groupes/strucnuc/AGATAWEEK/agataweek.html>

Talks fro *AGATA* weeks

[http://ireswww.in2p3.fr/ires/workshops/agata\\_week/](http://ireswww.in2p3.fr/ires/workshops/agata_week/)

<http://ns.ph.liv.ac.uk/agata/>

<http://www-win.gsi.de/agata/talks.htm>

***AGATA* web page**

<http://www.gsi.de/agata/>



# Thanks

