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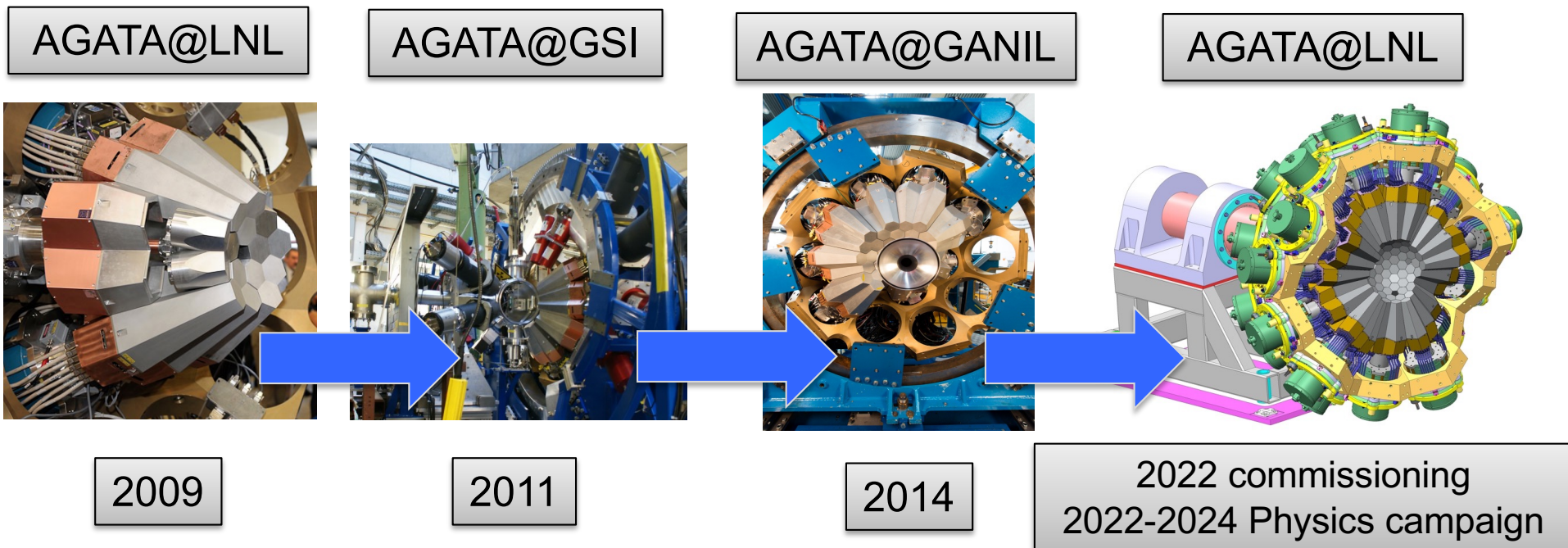
UNIVERSITÀ
DEGLI STUDI
DI PADOVA

Installation of AGATA@LNL

Jose Javier Valiente Dobón

Laboratori Nazionali di Legnaro (INFN), Italy.

The AGATA time line



Physics campaign coordinator: M. Zielinska

WG AGATA@LNL

Task 1, Infrastructure: Roberto Menegazzo

Task 2, AGATA Mechanics: Nicola Bez, Loris Ramina, Mirco Rampazzo, Marco Scarcioffolo, Diego Giora

Task 3, Experimentation mechanics: Giovanna Benzoni

Task 4, Safety and Quality: Maria Luisa Allegrini, Daniela Benini, Luca de Ruvo

Task 5, Computing and network infrastructures: Michele Gulmini, Massimo Biasotto, Sergio Fantinel

Task 6, Surveyor: Daniele Scarpa

Task 7, Detectors: Walter Raniero, Davide Rosso

Task 8, DAQ-Electronics: Alain Goasduff, Nicola Toniolo

Task 9, Complementary instrumentation: Daniele Mengoni

Task 10, Performance: Fabio Crespi, Simone Bottoni

Task 11, Exploitation: Andrea Gottardo, Oliver Wieland

Task 12, Data Analysis: Francesco Recchia

Task 13, Logistics: Paolo Cocconi

Task 14, Documentation and data base: Vincenzo Volpe

Task 15, Public exposure of AGATA activities: Andrea Gozzelino

AGATA at LNL: Working Together Guidelines. Version 0.4 2019



AGATA Management Board

Guidelines for Working Together during the
Installation and Deployment of AGATA at LNL.



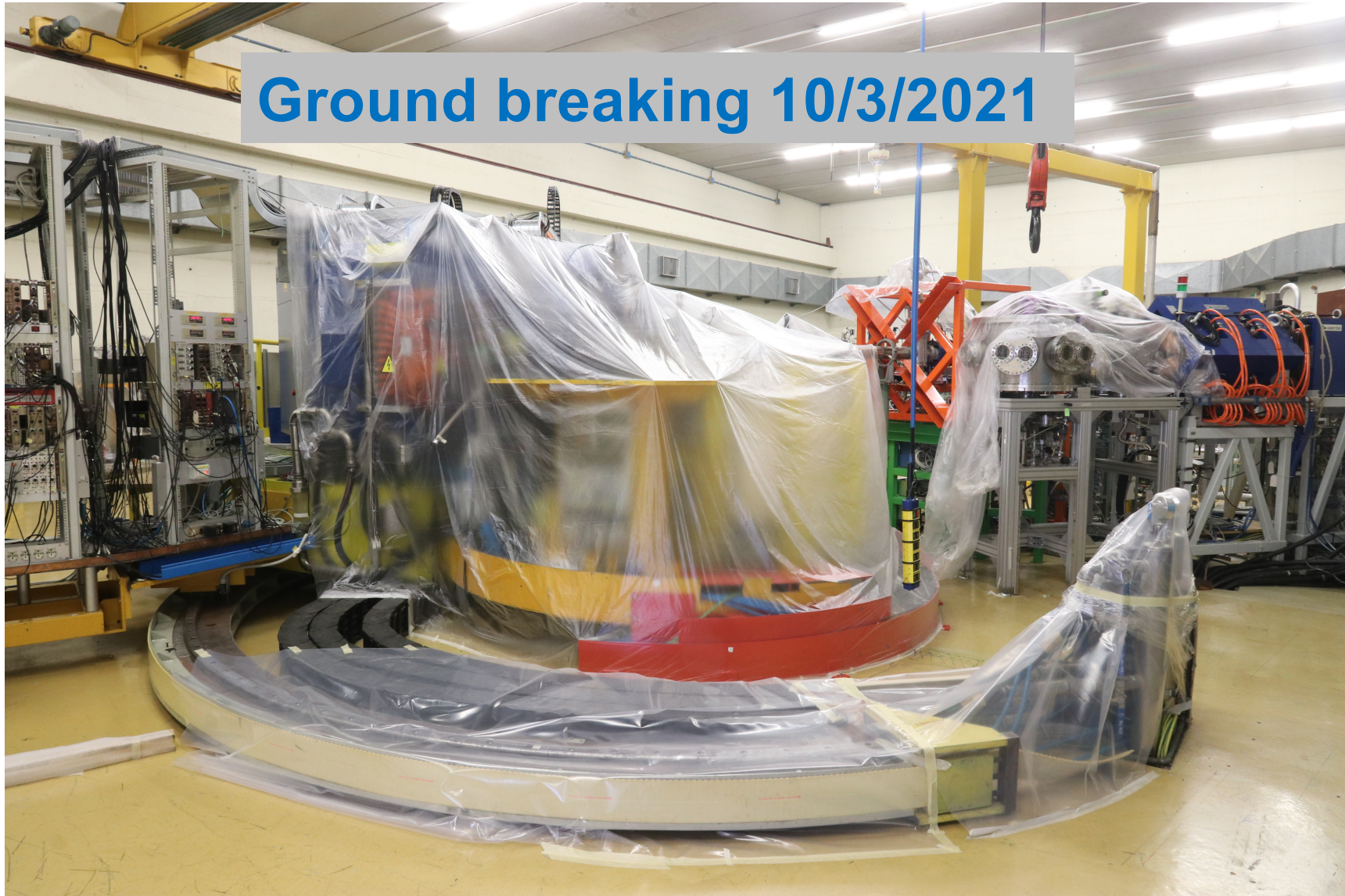
Work Document

Version 0.6, 2020

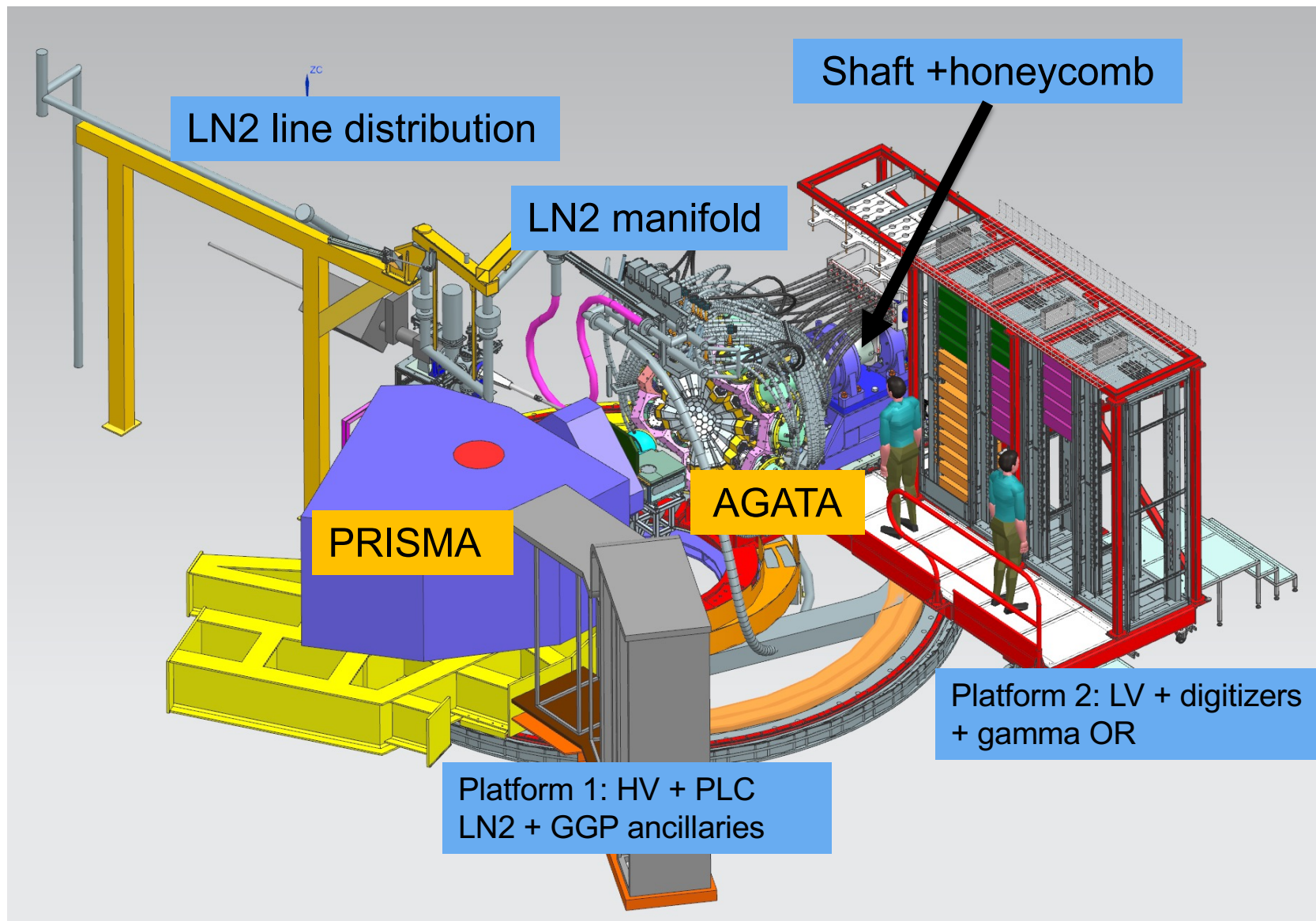
Contributors: A. Gadea, J.J. Valiente-Dobón

Ground breaking

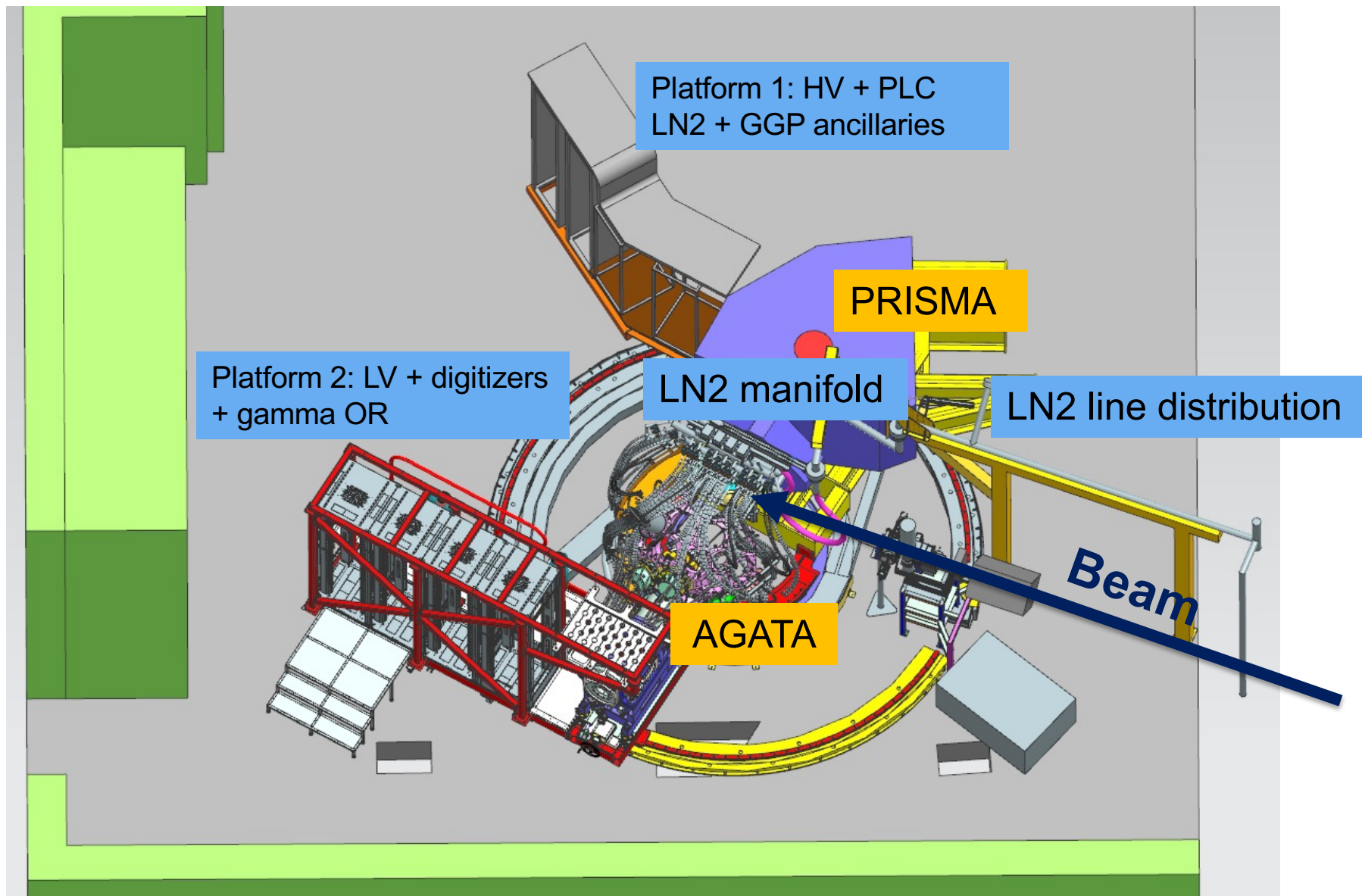
Ground breaking 10/3/2021



AGATA@LNL

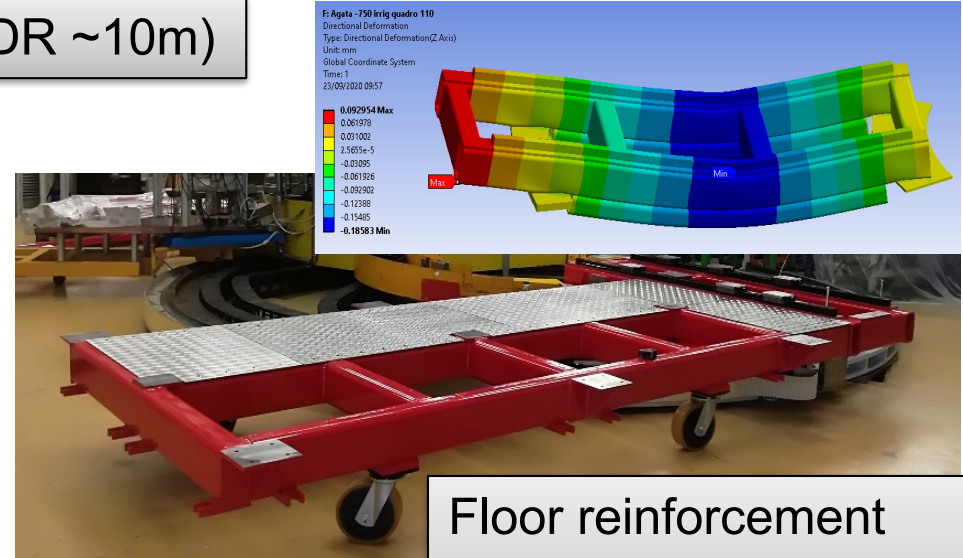
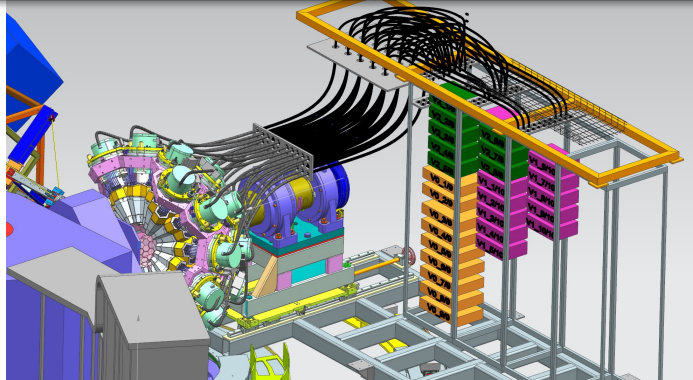


AGATA@LNL

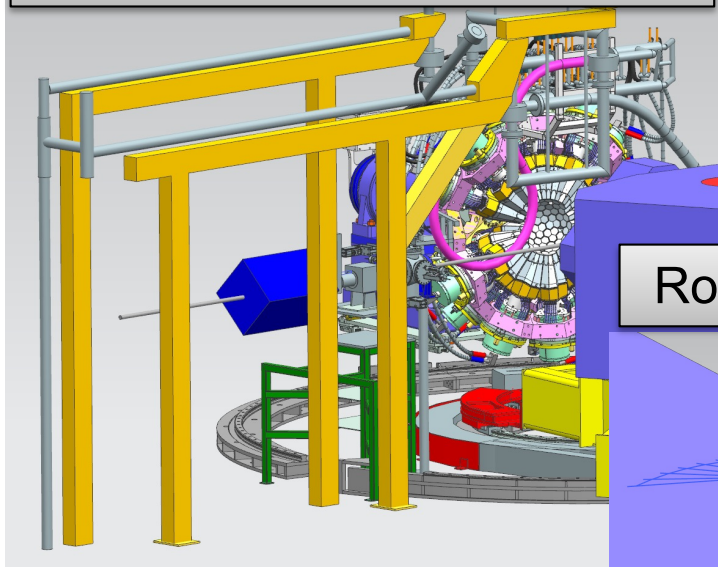


Infrastructures

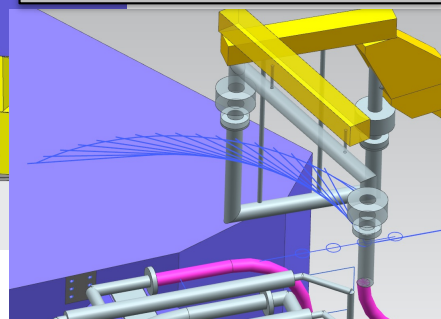
Cabling managing (~ 2000 cables, MDR ~10m)



Complex LN2 distribution line

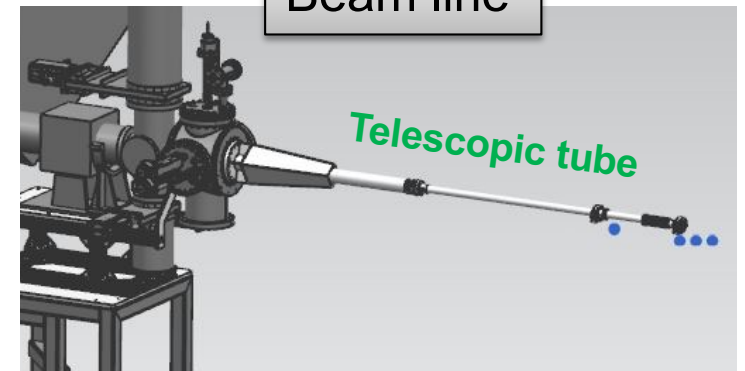


Roto-translation



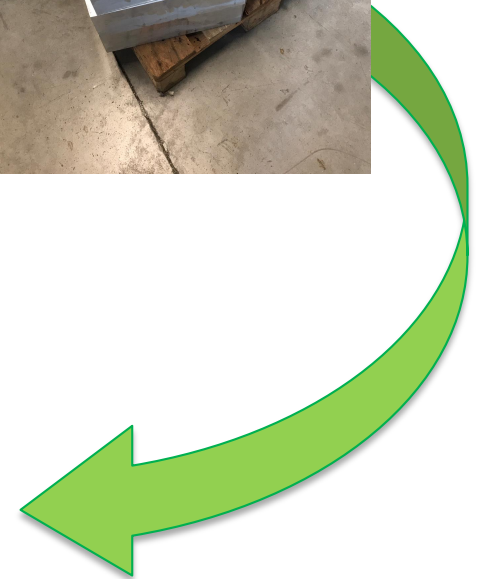
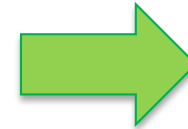
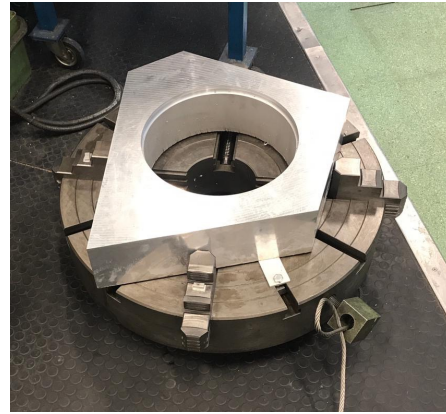
Floor reinforcement and rotating translating platform → ~ 5 Tones

Beam line



AGATA 2π flanges

Flanges realized within INFN



Some trucks arrived ...

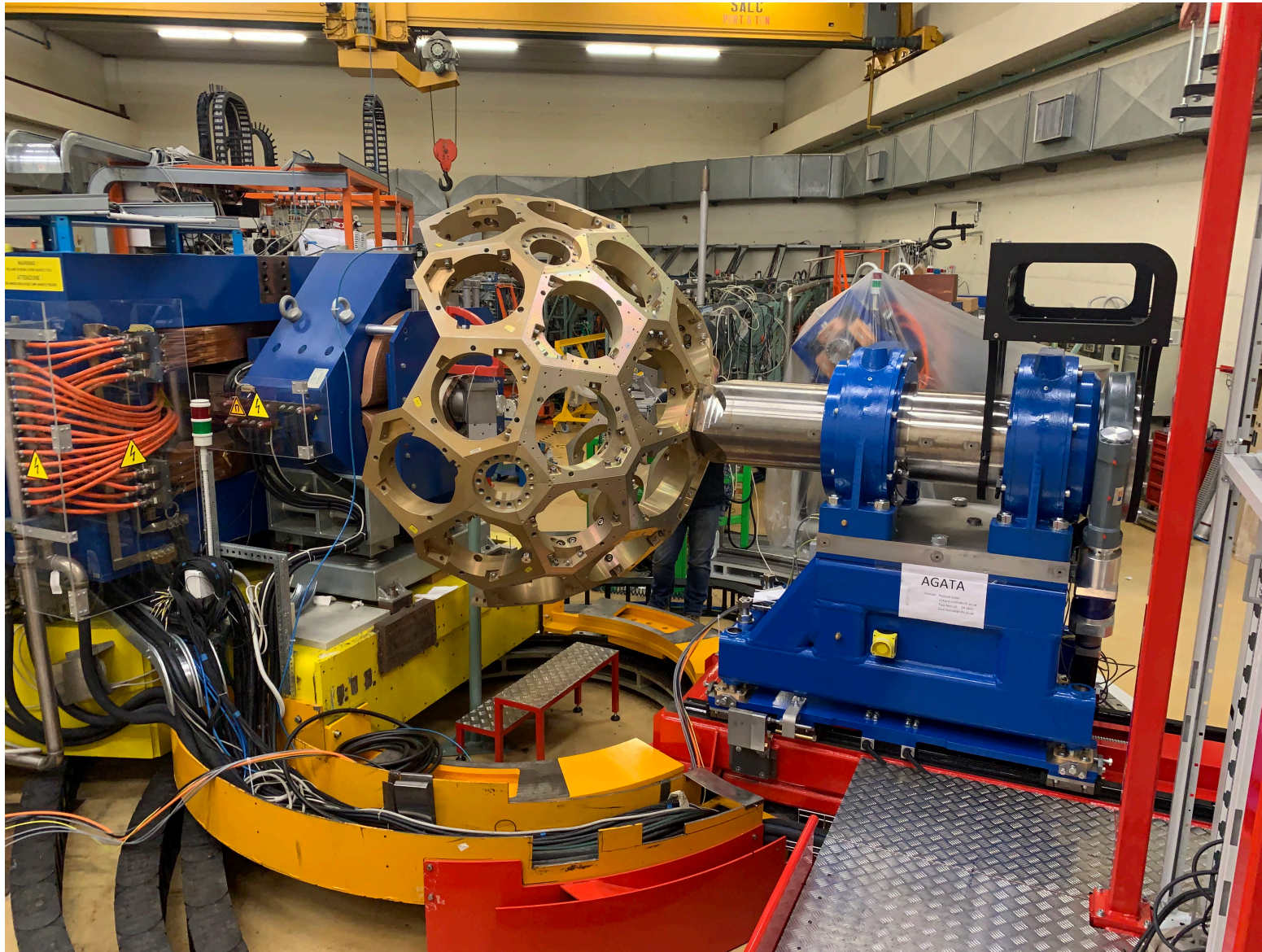


From France (GANIL)
September 8th 2021

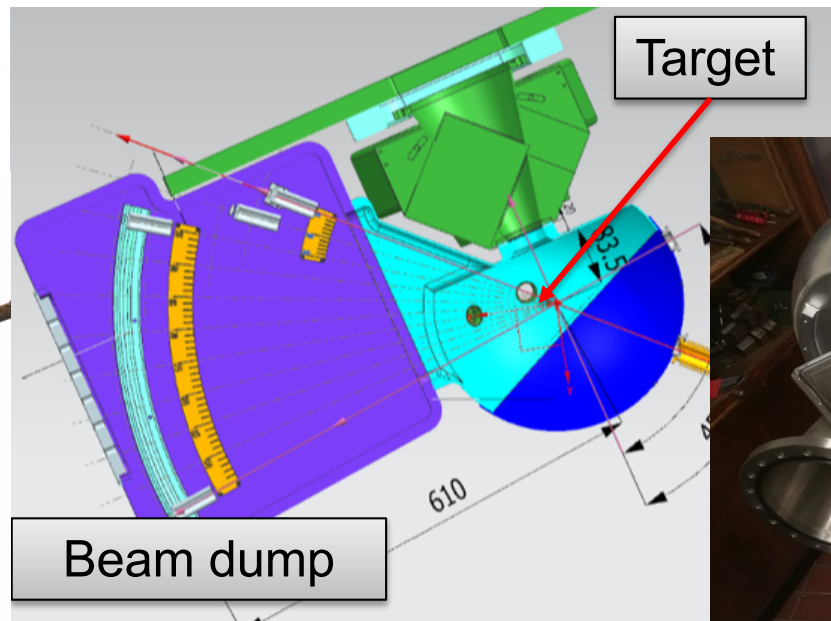
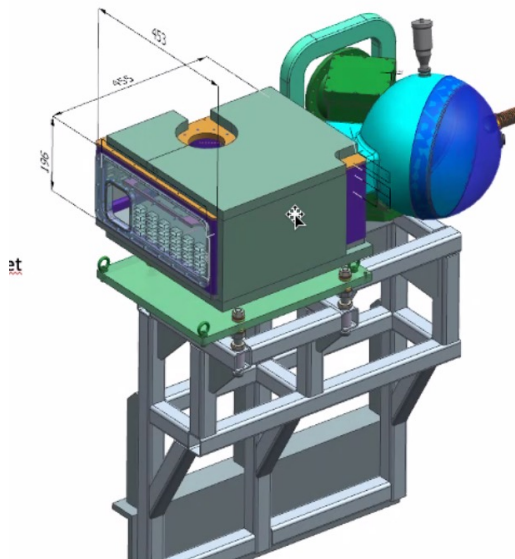
From UK (Daresbury)
October 12th 2021



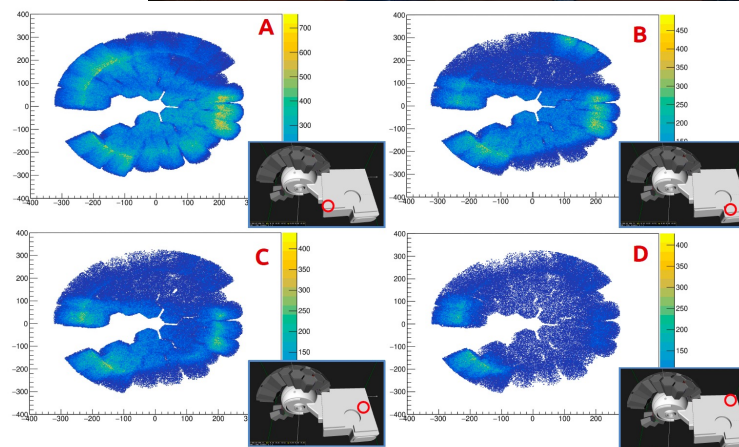
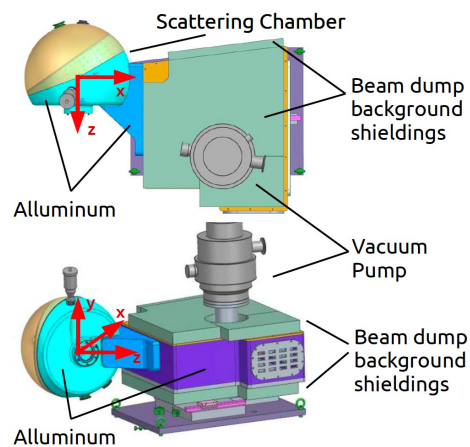
And here we are ...



Reaction Chamber



Simulations to define the shielding → to reduce the bkg



Simulations workshop AGATA@LNL



MILANO
17th-19th
January 2022

Registrations:
<https://agenda.infn.it/event/28706/>

Deadline: 8th of December

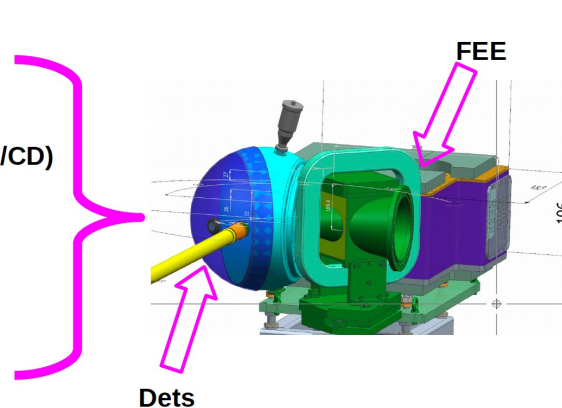
Ancillaries compatible with PRISMA

Silicon detectors:

- Coulex → SPIDER
- Transfer → GALTRACE (+SPIDER/CD)
- [Euclides]

Other...

- MCP → DANTE
- Plunger



Integration challenge

16:30 **PRISMA** 10'
Speaker: Franco Galtarossa

16:40 **GAL-TRACE** 10'
Speaker: Stefano Capra

16:50 **EUCLIDES** 10'
Speaker: Daniele Brugnara

17:00 **SPIDER** 10'
Speaker: Marco Rocchini

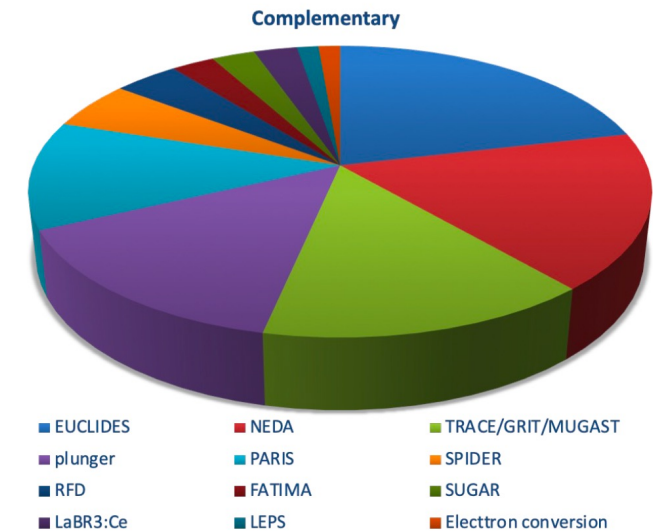
17:10 **DANTE** 10'
Speaker: Kseniia Rezykina

17:20 **Gamma-ray scintillators** 10'
Speaker: Sara Pigliapoco

17:30 **Plunger** 10'
Speaker: Irene Zanon

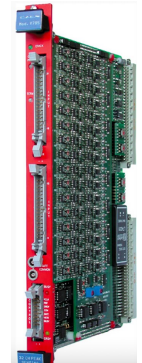
Inside reaction chamber

Outside reaction chamber



Electronics readout complementary

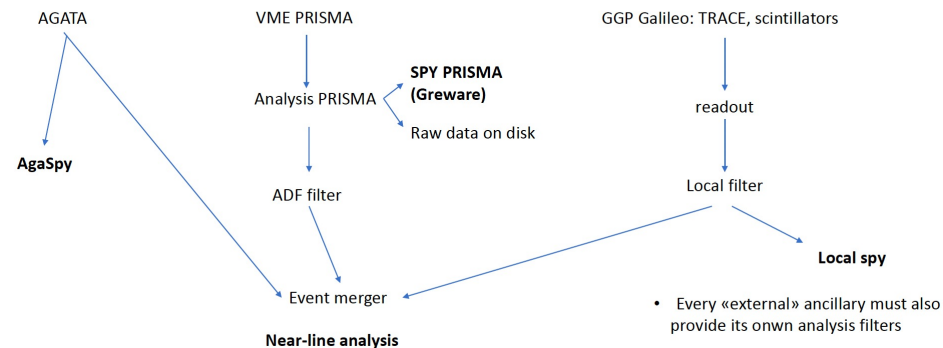
- "Traditional" VME (V785/V775) → PRISMA
 - Coupling to AGATA using the AGAVA
 - new VME bridge tested to reduce dead-time from 10% to 2% for 1KHz of PRISMA
- GGP readout → Si-array: EUCLIDES, SPIDER, TRACE, ...
 - Up to 12 systems available (Up to 434 channels depending on the FW)
- "Commercial" digitizers → PARIS, FATIMA, LaBr3 high efficiency
 - Coupling to AGATA using the AGAVA
 - Some digitizers available at LNL (16ch@500 and 64ch@250 MHz).
 - Solution adopted also for PARIS@EXOGAM collaboration



DAQ, network & near-online analysis

- Two distributed acquisition system (XDAQ – DCOD) - similar to GANIL situation. XDAQ → in AGATA format (ADF)
- New and centralized run control
- One single network: Inclusion of the ancillary detectors as Agata sub-network
- AGATA network isolated from the laboratory network
- VLAN access to lab resources (Printers, ...)
- Analysis programs are almost ready to perform near online analysis

Data flux and codes for on-line, near-line analysis



Monitoring and creation of metadata

Grafana

Hardware monitoring HW:

- HV HPGe and ancillaries
- LN2 germanium temp.
- GGP & digit. temperature
- GGP rates
- ...

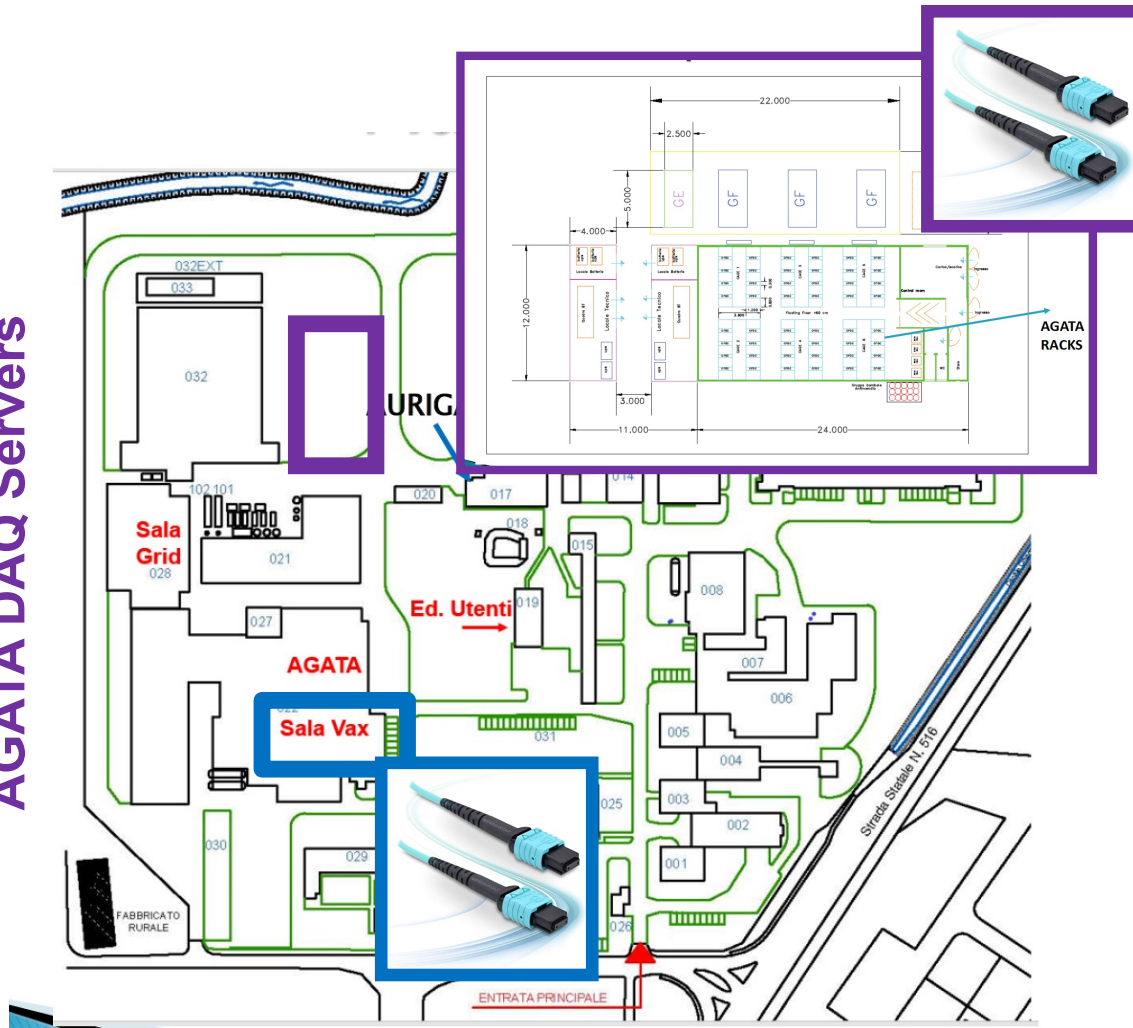
Software monitoring:

- buffer rates
- data bandwidth
- disk space
- ...



Data Centre for AGATA

AGATA DAQ Servers



ISTITUTO NAZIONALE DI FISICA NUCLEARE
Laboratori Nazionali di Legnaro

Proposta di un
Nuovo Data centre ai Laboratori Nazionali di Legnaro
Progetto Preliminare

Divisione Ricerca - Servizio Tecnologie Informatiche
Divisione Tecnica - Servizio Gestione Impianti e Sicurezza
Divisione Tecnica - Servizio Edilizia e Attività Generali

Versione 1.6: 04/09/2020



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<http://www.infn.it> - inf@na.infn.it - C.F. 9403050098

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Sala VAX → V1 electronics
New data centre → V2 electronics

First detectors at LNL

Dedicated detector laboratory + new area in experimental hall 2 (mount and test)

- Four Agata detectors arrived at LNL-INFN at 19/10/2021.
 - Two of these (ATC18 and ATC17) arrived completely mounted with capsules. These ATCs were pumped and cooled down.
 - Other two ATCs were delivered ATC1 and ATC7. These two ATC were completed mounted at LNL-INFN
- From 15/11/2021, another 2 ATCs will be delivered by the IPHC Strasburg to LNL-INFN (assembled and tested). From the first of December other 1 or 2 ATCs will be delivered from IKP Cologne to LNL-INFN (assembled and tested).



EMC tests

First test: July 2021

Second test: December 2021

Grounding of AGATA: to guarantee the signal integrity of the preamplifier which goes out from the Ge diode through the cold part FET transistor, to the warm part preamplifier and out to the Digitisers racks

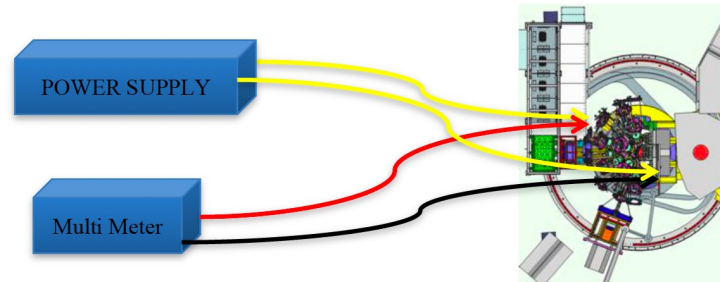


Figure 2 4 wire resistance measurement

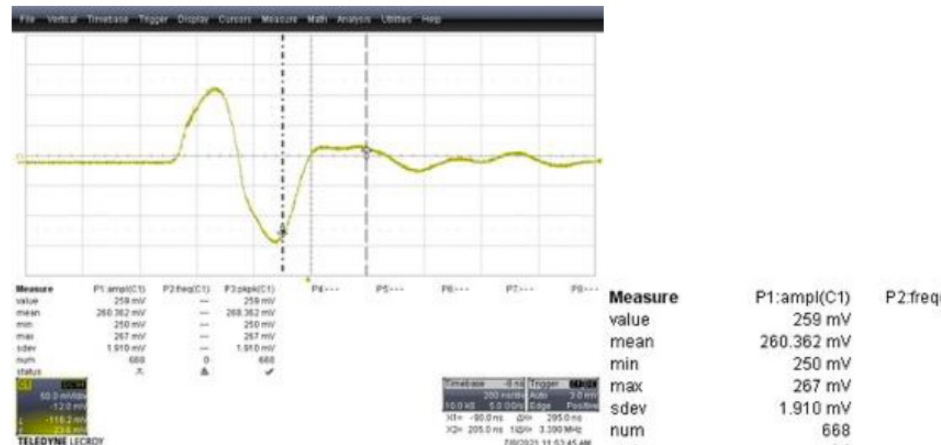
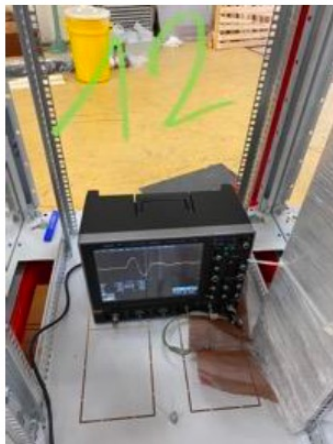
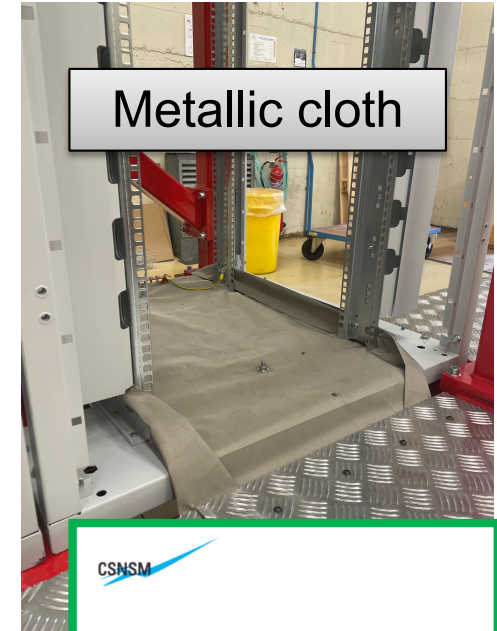


Figure 83 Direct injection inside the electronic bay floor SNR (dB):-84

CSNSM

AGATA PROJECT
EMC Report @ LEGNARO July 2021
By: N. KARKOUR

EMC-Report-@Legnaro/July2021.docx REV A
Created by karkour

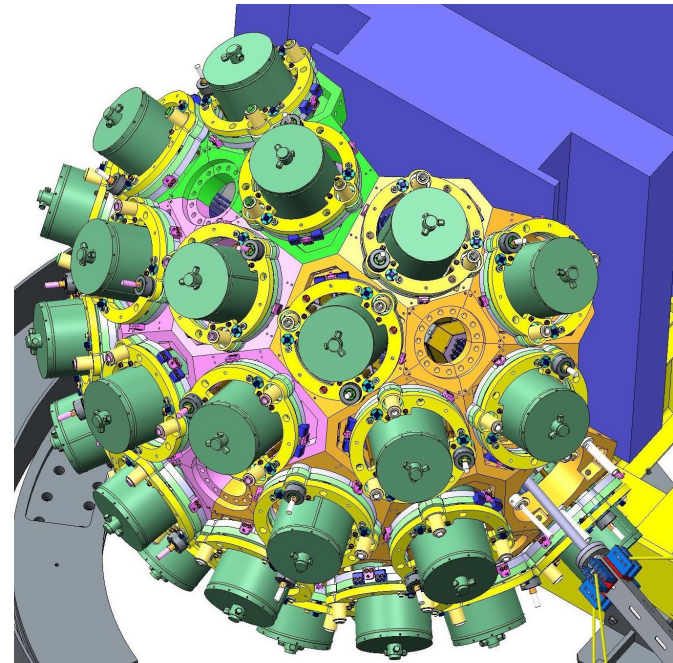
Centre de Spectrométrie Nucléaire et de Spectrométrie de Masse (C.S.N.S.M.)
Bâtiment 104 et 105 91605 ORSAY (FRANCE)
+33 1 69 15 32 15 +33 1 69 15 30 08

In beam commissioning

- Submission of an official proposal to the next LNL PAC
- Request ~4-5 days of beam time + 2 days source measurement
- Possible reaction ^{58}Ni @ **270MeV** on ^{124}Sn target or maybe comparison with other **previously done reactions** in the AGATA/CLARA campaign.

Important to be checked:

- Background from beam dump
- Count rate limits
- Correlations
- DAQ stability
- ...



AGATA target request

Universität zu Köln

Prof. Dr. Diego Bettoni
INFN-LNL viale dell'Università 2
52020 Legnaro (Padova)
Italy

Cologne 15.7.2019

Developments of new beams and for usage of targets currently unavailable at LNL

Dear Professor Diego Bettoni,

with this letter I like to draw your attention to some specific requests, discussed at the AGATA workshop recently held at LNL on March 25th and 26th, related to the physics program to be carry out using stable beams. Indeed some very interesting and highly competitive physics cases there presented turned out to require beams and targets currently not available at LNL. **In particular, the community is very interested in the use of ^{14}C , ^{238}U , ^{204}Hg ion beams and the new targets ^3H , $^9,^{10}\text{Be}$, ^{232}Th , ^{238}U for experiments with the AGATA array.**

We like to stress that the availability of those beams and targets will significantly extend the scientific potential of the experimental program at LNL with heavy ions in the areas of nuclear structure and dynamics, representing the main mission of the laboratory. The proposed developments will surely make LNL more competitive worldwide with other laboratories, such as GANIL (France), IPN-Orsay (France), GSI (Germany), ISOLDE (CERN), Argonne (USA), where such beams and targets are already in use. In addition, these developments will be beneficial also to the physics program using other instrumentation, in particular the magnetic spectrometers (PRISMA) and the charged-particle hodoscope GARFIELD.

For these reasons it would be very important that you could consider the development and/or permission requests to the authorities for the previously listed beams and targets species as an important part of the short term planning.



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Germany

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Telefax +49 221 470-5151

New targets ^3H , $^9,^{10}\text{Be}$, ^{232}Th , ^{238}U
New beams ^{14}C , ^{238}U , ^{204}Hg
Coordination with **LNL USERS**

In order to better organize the physics campaign in 2022, after the installation of AGATA in the second half of 2021 it is an essential issue for us to be informed, possibly within the end of this year 2019, on the feasibility of each requested new beam and target together with a tentative timeline for each development.

We are looking forward to hearing from you.

Sincerely yours

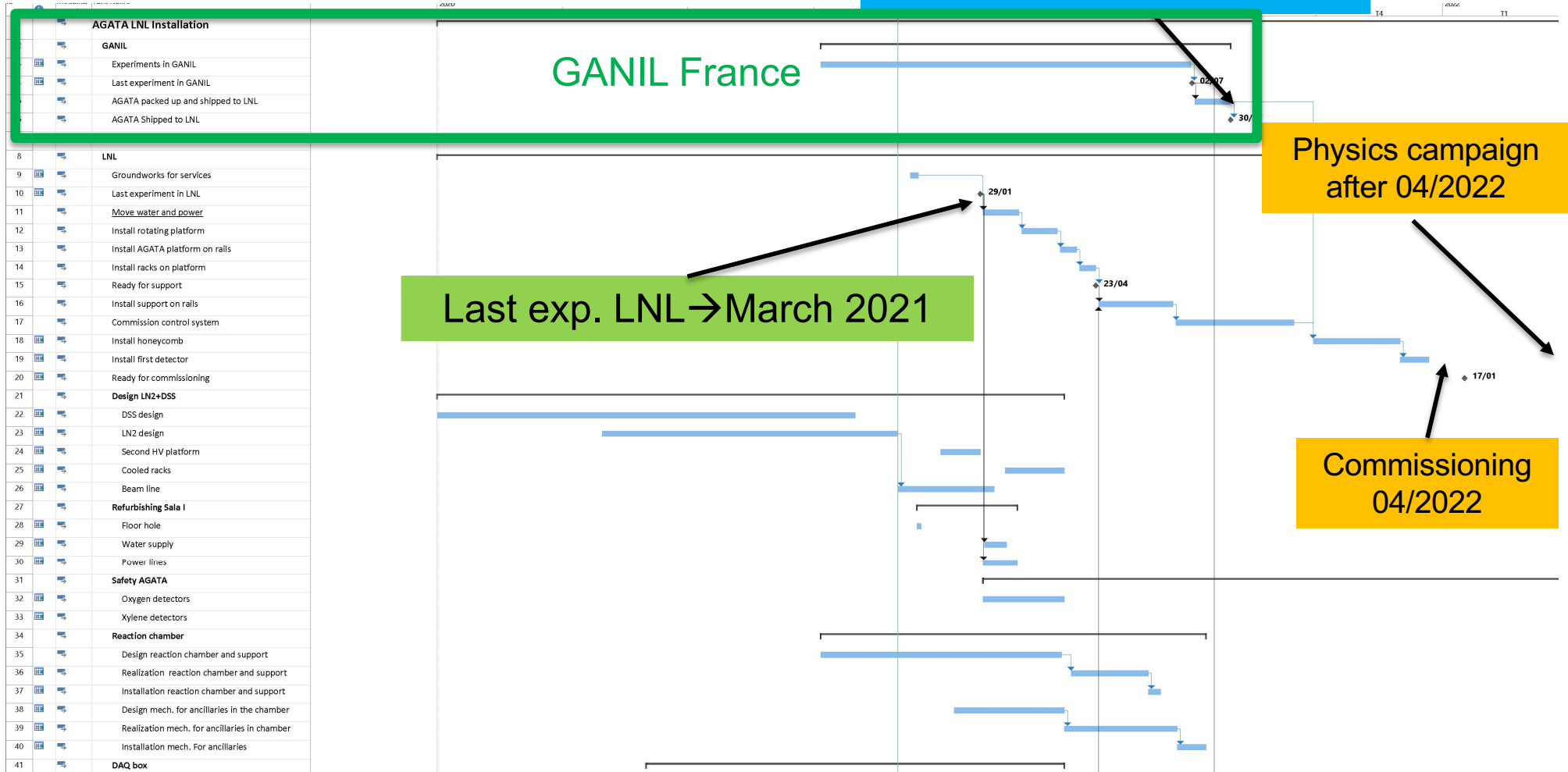
Prof. Peter Reiter
Chair of the AGATA Steering Committee

Prof. Wolfram Korten
Chair of the AGATA Collaboration Council

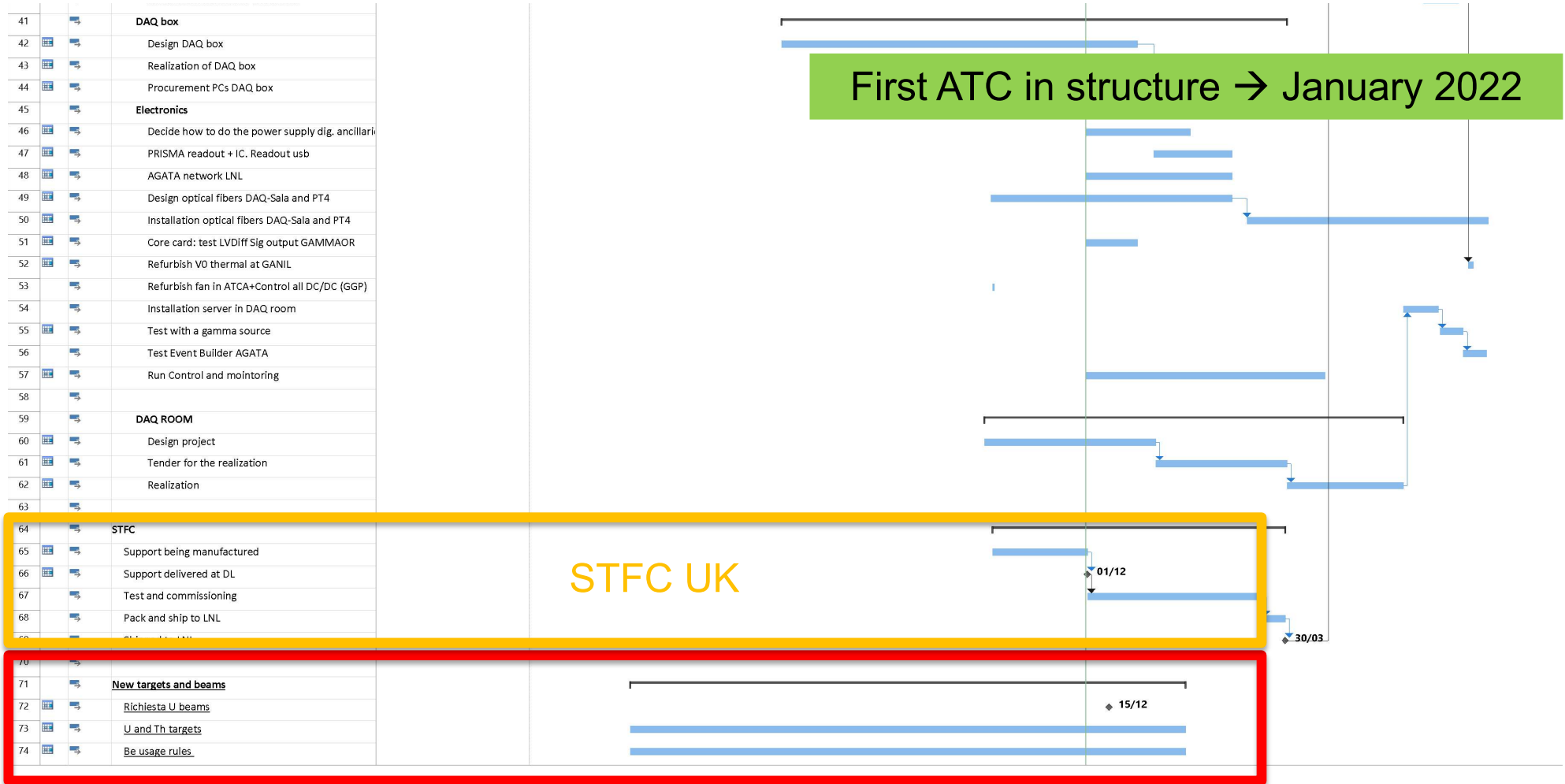
Targets: ^9Be (approved). ^{232}Th , ^{238}U first interaction with ISIN. Currently preparing the final report.
Beams: ^{238}U test with TI in progress ~ 2023

Time line installation

Transport of AGATA from GANIL ~ 1/9/2021



Time line installation



First ATC in structure → January 2022

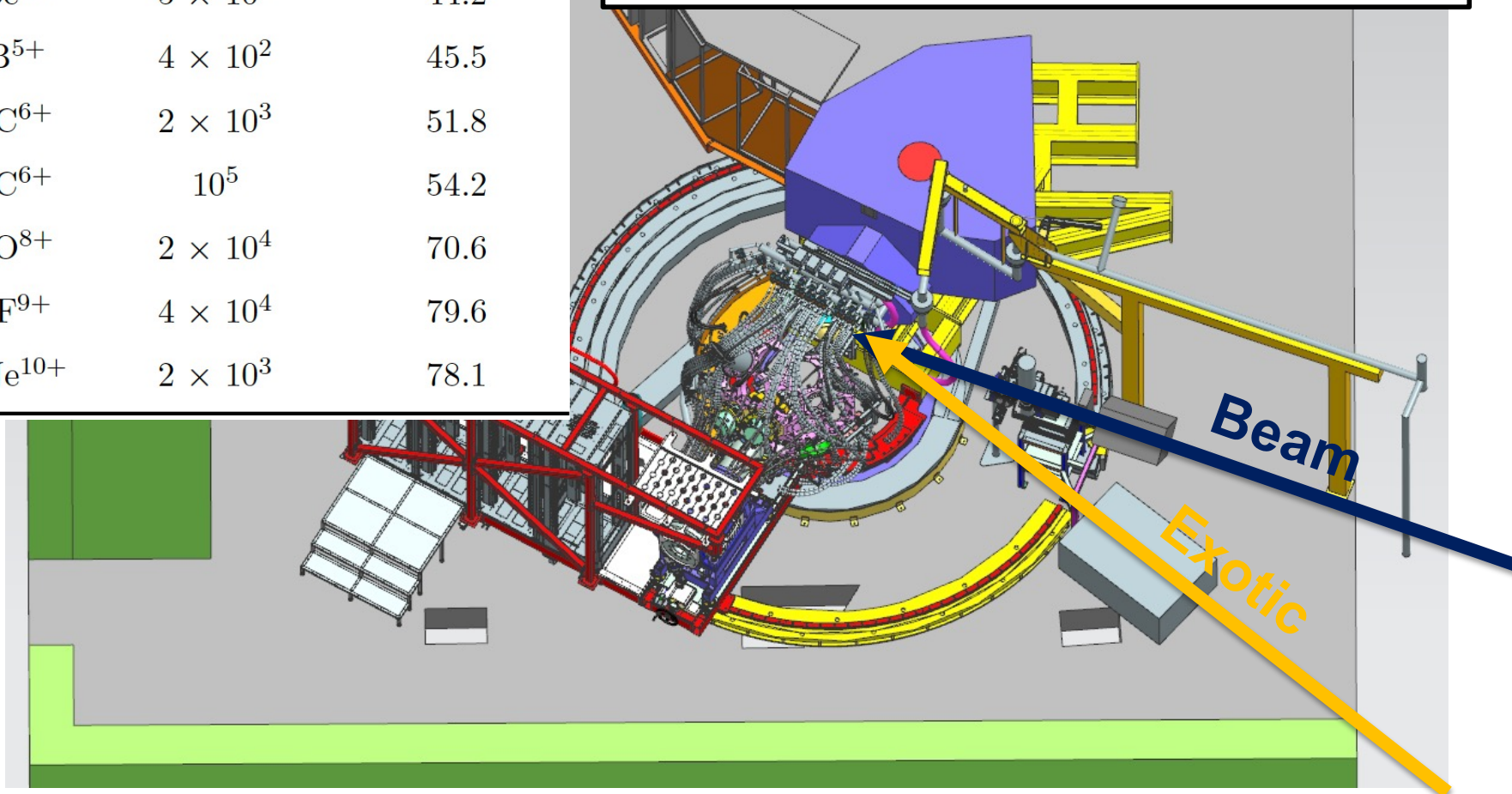
STFC UK

New targets and beams

Exotic beams

RIB	Intensity (pps)	E_{max} (MeV)
${}^8\text{Li}^{3+}$	5×10^4	21.7
${}^7\text{Be}^{4+}$	5×10^5	44.2
${}^8\text{B}^{5+}$	4×10^2	45.5
${}^{10}\text{C}^{6+}$	2×10^3	51.8
${}^{11}\text{C}^{6+}$	10^5	54.2
${}^{15}\text{O}^{8+}$	2×10^4	70.6
${}^{17}\text{F}^{9+}$	4×10^4	79.6
${}^{18}\text{Ne}^{10+}$	2×10^3	78.1

Possibility to connect the facility EXOTIC for the In-Flight production of light Radioactive Ion Beams to the gamma-ray Spectrometer AGATA



Summary

Installation of AGATA is at a very good point, thanks to LNL/PD/MI/FI services and physicists and the AGATA collaboration.

Great coherence in the collaboration between all the local groups and the AGATA collaboration.

THANKS TO ALL OF YOU!

Amazing reaction from the community, 34 Lols!!!

→ See talk M. Zielinska



END

Data base

An Oracle Database, hosted at the Computer Center of IN2P3 and a Graphical User Interface in Java to track the construction and configuration of AGATA.

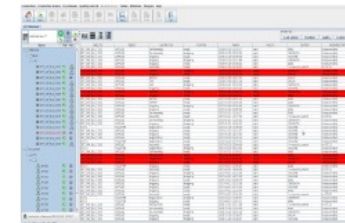
Objects are identified by barcodes and structured by [ObjectName/type/version] and a barcode reader must be used to scan barcodes stuck on them



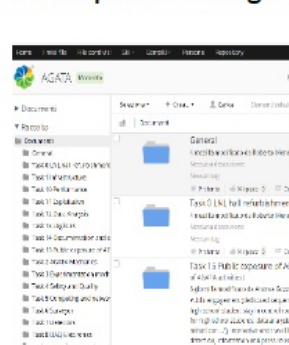
Also each transfer is identified by a barcode (stuck on the transfer box) in which are explained: objects to move, two actions (sending and reception) and the persons involved. Then, the location of objects are automatically update in the DB.

This tool, it has been proven by the past, is important for the move of AGATA facilitating the inventory of transferred objects.

You can search within objects and the result is shown in a rich tree structured by object/type/version and the list of corresponding barcodes.



An object browser panel displays various information on objects, the object history panel gives details on actions done in time on these and the object move panel manage the transfers of different objects between centers.



document management software

each task.

—for file libraries, folders and
and delete documents

oll-back functionality, simplifies
tegrity

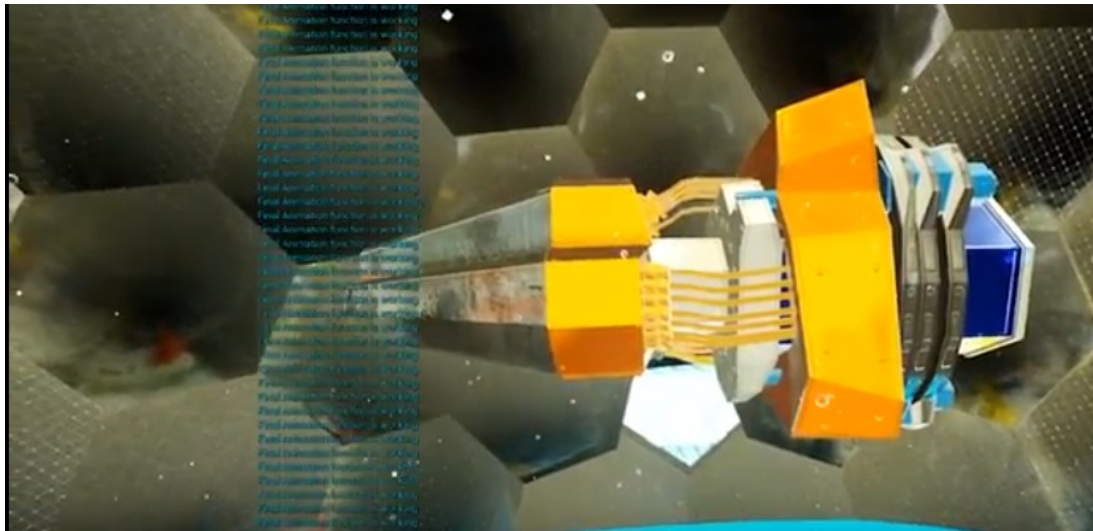
Public exposure of AGATA activities

Collaboration with Alessia Lorenzi, student of New Art Technologies at Accademia delle Belle Arti in Venice, under the Lorenzo Pranovi's supervision (internal tutor)

AGATA is in the mainframe of the LNL virtual tour

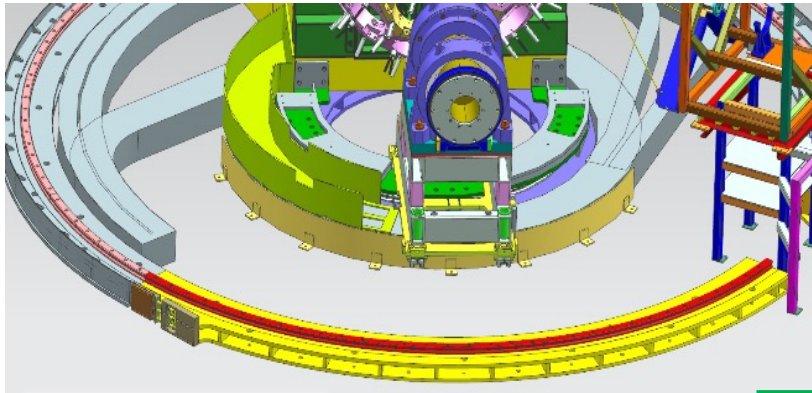
AGATA is part of Alessia Lorenzi's thesis the thesis/project is an interactive experience in virtual reality

Facebook



AGATA rotating tracks

Design of the missing piece of rail.



February 2021



March 2021

