









ALBA Tango CS Status

27/June/2023

- Team updates
- Current Status - Highlights
- Organization of Activities
- Contributions to the Community
- ALBA II

Team Updates



 Jordi Aguilar Larruy 4097 jalarruy@cells.es	 Fulvio Becheri 4340 fbecheri@cells.es is absent this morning	 Martí Caixal Joaniquet mcaixal@cells.es	 José Gabriel Centeno Gabadinho 4041 jcenteno@cells.es	 Guifré Cuní Soler 4415 gcuni@cells.es	 Roberto Javier Homs Puron 4409 rhoms@cells.es is absent for a few hours
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 Student Daniel Martínez Góngora 4563 dmartinez@axt.email	 Jairo Moides Fuentes 4339 jmoides@cells.es	 Emilio José Morales Alejandre 4089 emorales@cells.es	 Miquel Navarro Fernández 4078 mnavarro@cells.es	 Albert Ollé Sabaté 4057 aolle@cells.es	 Jose Antonio Ramos Andrade 4417 jramos@cells.es
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 Zbigniew Reszela 4407 zreszela@cells.es	 Alberto Rubio García 4462 arubio@cells.es	 Sergio Rubio Manrique 4387 srubio@cells.es	 Nil Serra Peinado 4377 nserra@cells.es	 Student Erik Tarruella Segura 4556 etarruella@axt.email	 Oriol Vallcorba Vals 4363 ovalcorba@cells.es is absent today
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 Jorge Villanueva Cuenda 4392 jvillanueva@cells.es is absent today	 Steven Wohl 4091 swohl@cells.es
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>8 years: 9 people
>2 years: 1 person
Newcomers (<2y): 8 people
Students
Controls Section: 20 people (2 vacants)

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Current Status - Highlights - ALBA Controls Systems Upgrade to Tango 9



ALBA Control System started development on 2006, starting operation in 2010 (booster commissioning) and **production** status since **2012**.

ALBA CS was based on **Tango 7** running mostly on 32 bit cpci machines.

Upgrade to Tango 9 have been initiated **top-to-bottom**, starting on Tango DB, GUI's and middle layer devices (not tied to hardware) like Sardana and HDB++.

The SuSE diskless image have been finally replaced by Debian 10 in 2022.

Tango 7 hosts still pending to be migrated affect mostly beamlines where hardware is highly heterogeneous.

First tests with 9.4.x have been started on middle-layer devices, finding **several incompatibilities with Tango 7 events** from legacy systems.

Current Status - Highlights - Accelerators



Accelerator Control Systems:

6162 Tango devices

1015 servers

694 already upgraded to Tango9 (68%)

174 control hosts:

Tango7 (suse11): 50

Tango8 (suse12): 18

Tango9 (debian9-10): **106**

Alarm System:

461 Alarms declared

3327 Attributes checked

102 PyAlarm devices

60 PyAlarm servers

Accelerators Archiving (HDB++, 6 months):

hdbacc: 943 attributes, 437 GB

hdbct: 3984 attributes, 576 GB

hdbdi: 3905 attributes, 2198 GB

hdbpc: 3127 attributes, 1112 GB

hdbrf: 3950 attributes, 525 GB

hdbvc: 4976 attributes, 1115 GB

Secondary host stores decimated historical data (5 years, 5TB)

44 Event Subscribers + 52 Periodic Archivers for legacy systems.

Current Status - Highlights - Beamlines



Beamlines Control Systems:

7717 Tango devices

982 servers

414 already upgraded to Tango9

128 control hosts

Tango7 (suse11): 34

Tango8 (suse12): 11

Tango9 (debian9-10): **83**

Upgrade to Tango 9 Status (42%):

BL01 :	100%
BL04 : 29/117 upgraded	27%
BL06 :	100%
BL09 : 26/85 upgraded	33%
BL11 : 28/94 upgraded	36%
BL13 : 36/98 upgraded	40%
BL16 :	100%
BL20 :	100%
BL22 : 34/93 upgraded	37%
BL24 : 20/117 upgraded	21%
BL25 :	100%
BL29 : 17/126	15%

At ALBA **several approaches** are used depending on the domain (from less updated to more frequently updated):

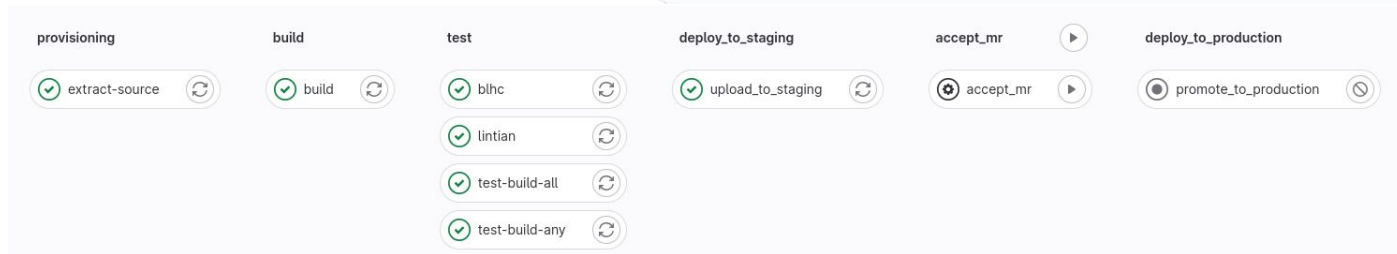
- Input-Output Diskless machines for acquisition and control hardware. The **shared image** is updated from production repository (our own Debian packages)
- Service-dedicated **VM machines**: alarms, archiving, experiment control, on-the-fly calculation, ... This machines are updated via salt recipes specific for each service and tagged by service releases
- Operator-validated GUI applications: control room follows an **specific workflow validating each release during a machine run** (5-6 weeks) prior to releasing the update to all operators consoles

These 3-level approaches allowed to have frequently updated user applications while keeping the backbone as stable as possible.

Current Status - Highlights - Deployment



- Controls Software deployment via:
 - Debian packages (80%)



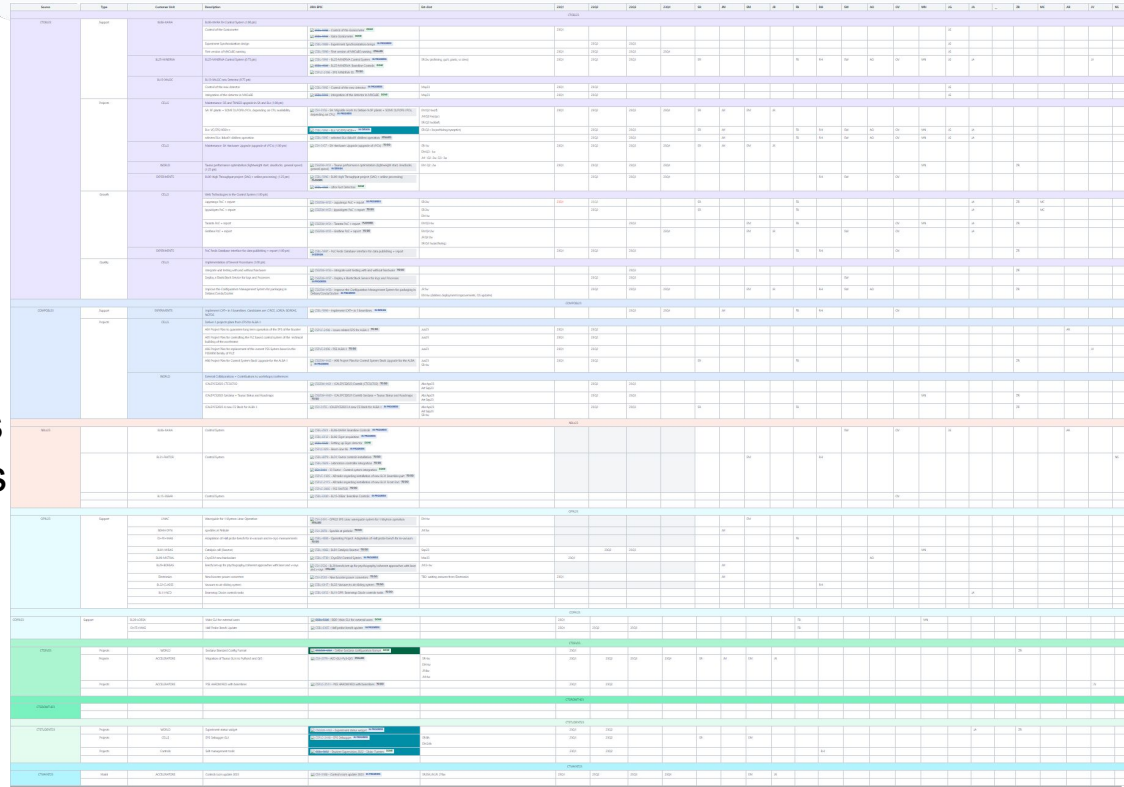
- conda (10%)
- pip (5%)
- Docker (5%)
- Conda & Docker are being evaluated for ALBA II
- Configuration management via Salt
 - packages installation
 - basic software configuration
 - custom implementation with *Services*
- Control System configuration to be evaluate for ALBA II

- Considering desktop applications, a priori, we don't see a need to replace Taurus, but we should invest time in **improving scalability and performance of Taurus GUIs**
- **Web** technologies needs to be explored **as a complementary solution** because of the cross-platform compatibility, reduced cost of maintenance and native remote access (concerning the security aspects)
- Regarding web application we selected: **Taranta** and **Jupyter Lab** because of their generic approach and a strong community (Taranta Community is gaining more popularity and is a lead Web project in Tango)
- In terms of the technology stack the most common within our community (ICALEPCS) is **React (+Redux), Plotly, GraphQL** and **REST** and we will follow this trend

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Sources for our developments

- Annual Objectives
 - Controls Section
 - Computing Division
- Accelerator & Experiment:
 - New Beamlines Program
 - Priority Operation Projects
- Internal Controls Developments
 - Projects
 - New technologies
 - Students
 - Maintenance

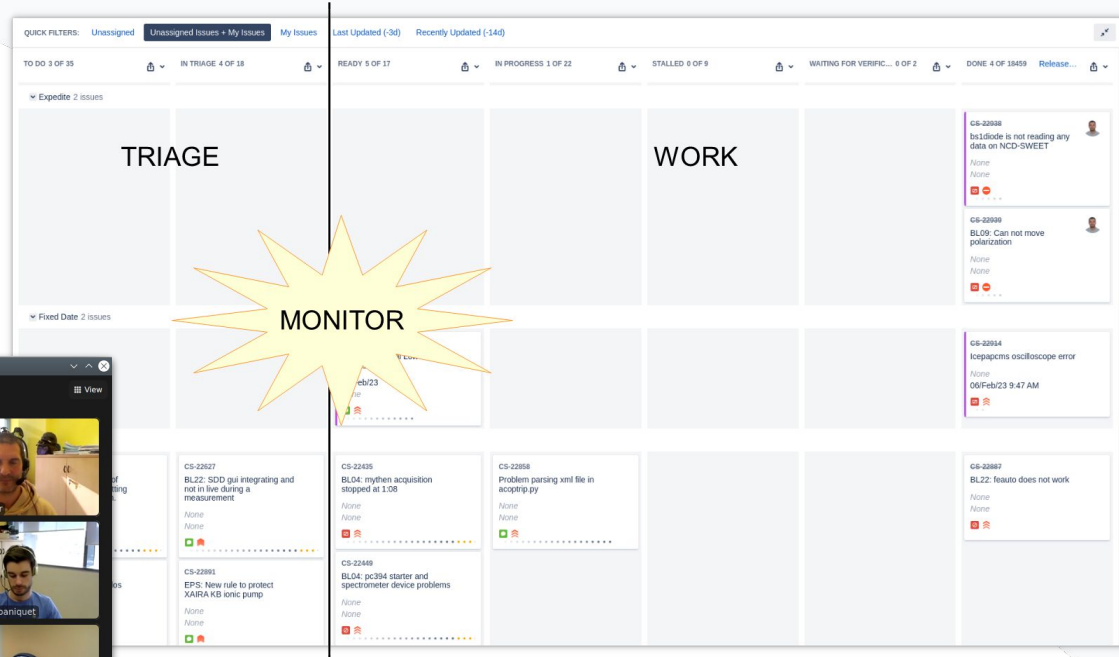


The table displays a detailed activity plan with columns for months (from 2023 to 2025) and rows for various projects and tasks. The activities are color-coded into several categories: purple (top section), blue (middle section), orange (lower middle), cyan (lower), green (bottom), and light blue (very bottom). Each row contains a list of tasks and their corresponding durations across the time period.

Organization - Service Support



- Operation days
- Rotating Role
- Shared Calendar



27-Jun-23 - 37th TANGO Community meeting @SKAO HQ

Organization - Development



- Any type of work is represented on the board
- One board for the whole section
- Each team has its own view by filtering the main board
- Cross team assignees

The screenshot displays a Jira board with the following structure:

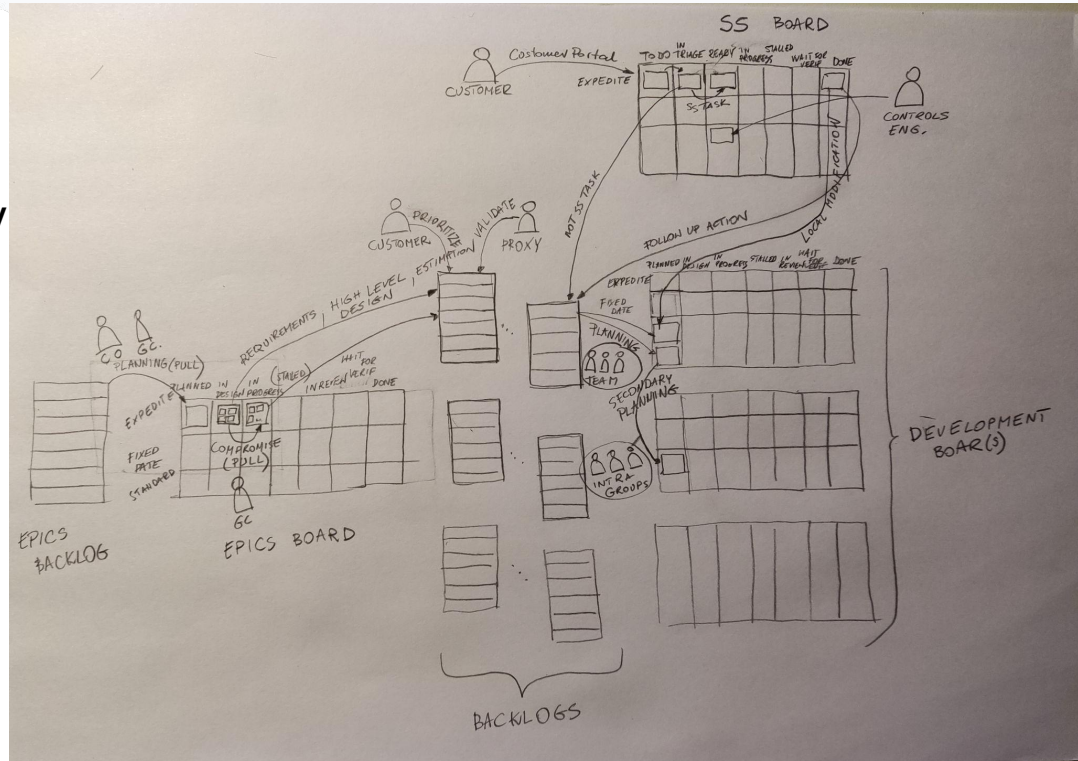
- QUICK FILTERS:** CTAct23, T2, T3, T4, T5, NextShutdown, EPIC, MyIssues, CS, CSMACH, CSBL, **CSGSW**, ACC, ACCOP, LINAC, RF, FE+IDs, BeamPhys+BL34, BL01, BL04, BL06, BL09, BL11, BL13, BL15, BL16, BL20, BL22, BL24, BL25, BL29, BL31, LAOP, Eng, Safety, Tango, Sardana, Taurus, DevOps, Motion, DAQ, Detectors, SciSoft, **NO-NOISE**, NO-SUB, NO-BL, **NO-PLC**
- Recently Updated:** ChangeReview, 2023, ... Show fewer
- PLANNED 2 OF 84** | **IN DESIGN 1 OF 9** | **IN PROGRESS 8 OF 318** | **STALLED 4 OF 134** | **IN REVIEW 5 OF 13** | **WAITING FOR VE... 1 OF 27** | **DO... 7 OF 8345 Release...**
- Standard 26 issues**
- Issues:**
 - CSBL-5253:** BL04: Implement trigger by position. Assignee: None. Priority: None. Labels: BL04 MSPD.
 - CSGSW-4544:** Is pytwobengine optional or not? (#1287). Assignee: None. Priority: None. Labels: World.
 - CSGSW-4506:** Profile case studies. Assignee: None. Priority: None. Labels: World. Tag: CT Taurus performance.
 - CSBL-6213:** BL24: Migrate Sardana to be able to use SEP20. Assignee: None. Priority: None. Labels: BL24 CIRCE.
 - CSGSW-4403:** Survey of Tango sites. Assignee: None. Priority: None. Labels: World.
 - CS-22437:** Step scans get hanged when using bl29_adc_hyst meas. Assignee: None. Priority: None. Labels: BL29 BOREAS.
 - CSGSW-4542:** Prepare Experiment Status Widget to be integrated into Sardana. Assignee: None. Priority: None. Labels: World. Tag: Sardana Experiment St...
 - CSGSW-4413:** Deal with Upcoming changes to your free Cit.Lab SaaS account for. Assignee: None. Priority: None. Labels: World.
 - CSGSW-4416:** POC validating if jpyTango could work with Taurus. Assignee: None. Priority: None. Labels: World.
 - CSBL-5921:** BL11: issues during motor movement. Assignee: None. Priority: None. Labels: BL11 NCD.
 - CS-23341:** Moxa configuration problem. Assignee: None. Priority: None. Labels: Optics Lab.
 - CSGSW-4356:** Sardana: Inconsistent ways of getting tango host database. Assignee: None. Priority: None. Labels: Controls.
 - CSGSW-4540:** Inconsistent reconfig on a controller (#1785). Assignee: None. Priority: None. Labels: World. Tag: Sardana Experiment St...
 - CSGSW-4480:** POC of benchmarking. Assignee: None. Priority: None. Labels: World. Tag: CT Taurus performance.
 - CSGSW-4547:** Ensure that we can debug processes and core dumps in conda environments. Assignee: None. Priority: None. Labels: Controls.
 - 6565W-4500:** Organize first Taurus follow-up meeting. Assignee: None. Priority: None. Labels: World.
 - 6565W-4503:** Write announcement email. Assignee: None. Priority: None. Labels: World.
 - 6565W-4509:** Analyze if Green Mode could bring benefits to Taurus scheme. Assignee: None. Priority: None. Labels: World. Tag: CT Taurus performance.
 - 6565W-4510:** Check if Green Mode servers needs special treatment. Assignee: None. Priority: None. Labels: World. Tag: CT Taurus performance.

Different workflows:

- Planning: Backlog -> Dev
- Local modifications SS -> Dev
- Not SS -> Backlogs
- SS Follow-up -> Backlogs

Different Classes of Service:

- T2 - CU prioritized issues
- T3 - CO prioritized Activities
- T4 - CT prioritized Activities
- T5 - CT prioritized issues (mainly Maintenance)

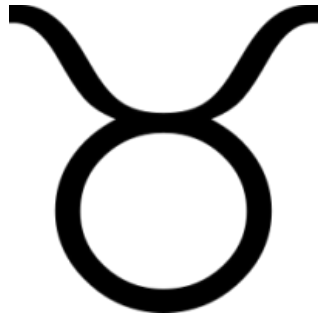


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- Contributions to Tango & PyTango require deep kernel knowledge.
- Currently there are 3 persons which contribute to Tango and PyTango:
 - Jairo Moldes, Jose Ramos and Sergi Rubio
- Tango SIG - IDLv6 organized at ALBA - report will be presented on **Wednesday afternoon**



- Sardana & Taurus has mature communities of users and developers
- Due to a big turnover and Carlos leave the newcomers had to be trained in Taurus
- Currently there are at least 3-4 persons at ALBA actively contributing to Sardana and Taurus
- Taurus & Sardana status report **talks on Wednesday afternoon**



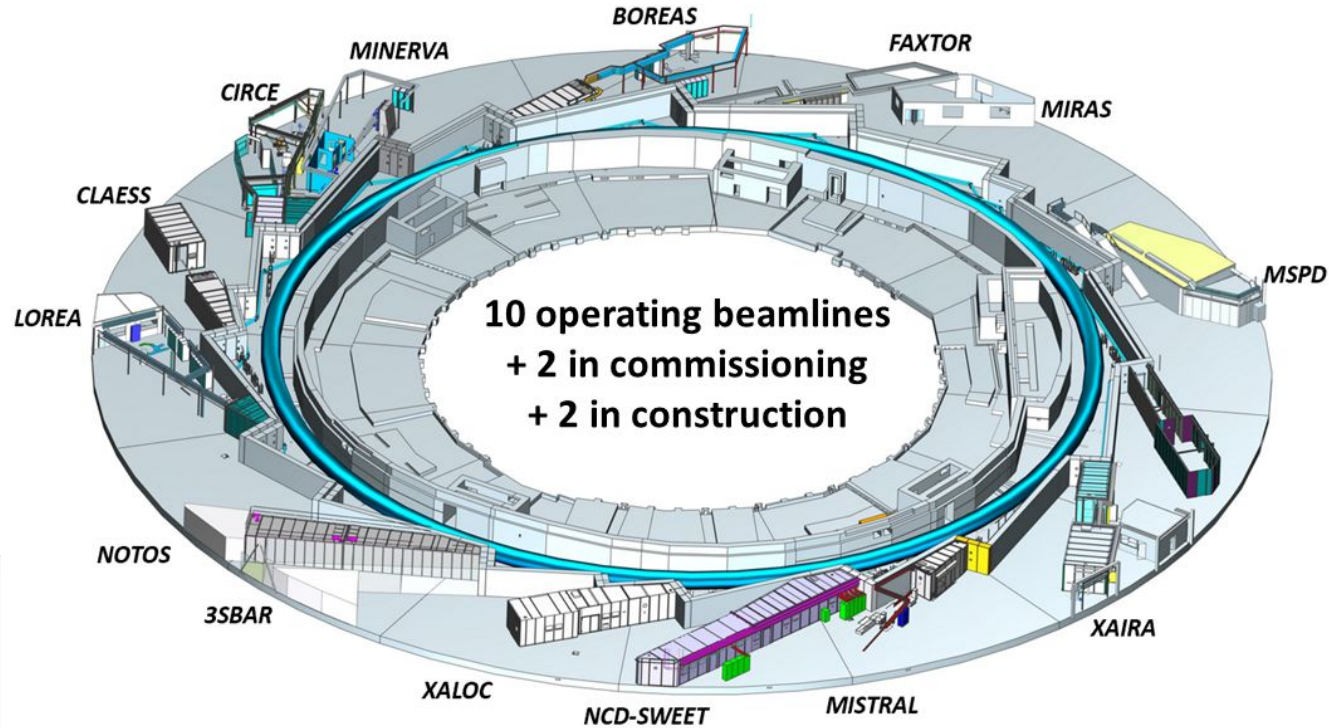
ALBA Developments presented in this Tango Meeting:

- TaurusTrend with HDB++ archiving support
- pyhdbpp library for python access to archiving data will be presented **Tuesday afternoon**
- Panic alarms and fandango utilities

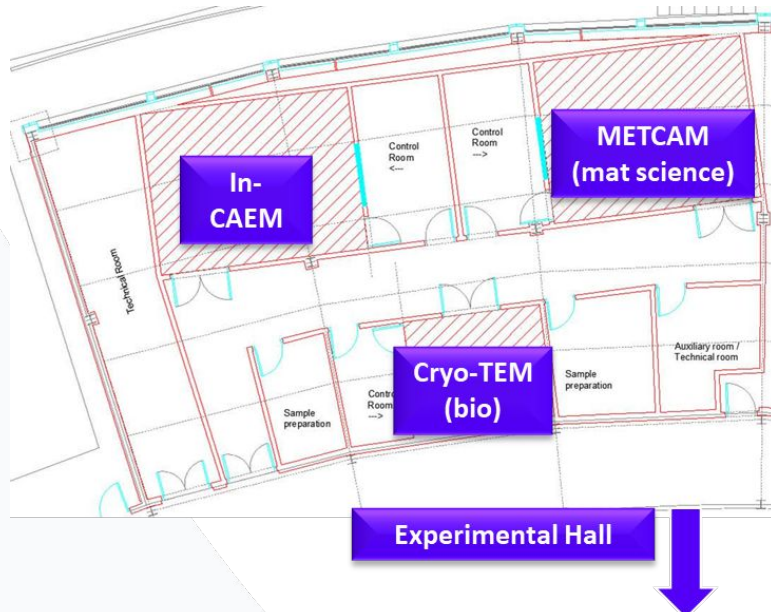


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- Current situation as of June 2023



- JEMCA (Joint Electron Microscopy Center at ALBA)
 - <https://www.albasynchrotron.es/en/instrumentation/jemca>
 - it already hosts two Transmission Electron Microscopes
 - A 200 kV TEM, Glacios from ThermoFisher Scientific (Life Sciences)
 - A 300 kV (S)TEM, Spectra 300 from ThermoFisher Scientific (Material Science)
 - a third Microscope will be arriving in the near future



The project is co-funded by the European Regional Development Fund (ERDF) within the Framework of the ERDF Operative Programme of Catalonia 2014-2020.



2020

- Starting the design
- Present “pre- White Paper” to funding agencies
<https://www.cells.es/en/science-at-alba/alba-ii-upgrade/alba-ii-short-version-december-2020.pdf>

2021

- ALBA II included in the Strategy Plan 2021-2024
- Funding for prototyping (7.5M€)

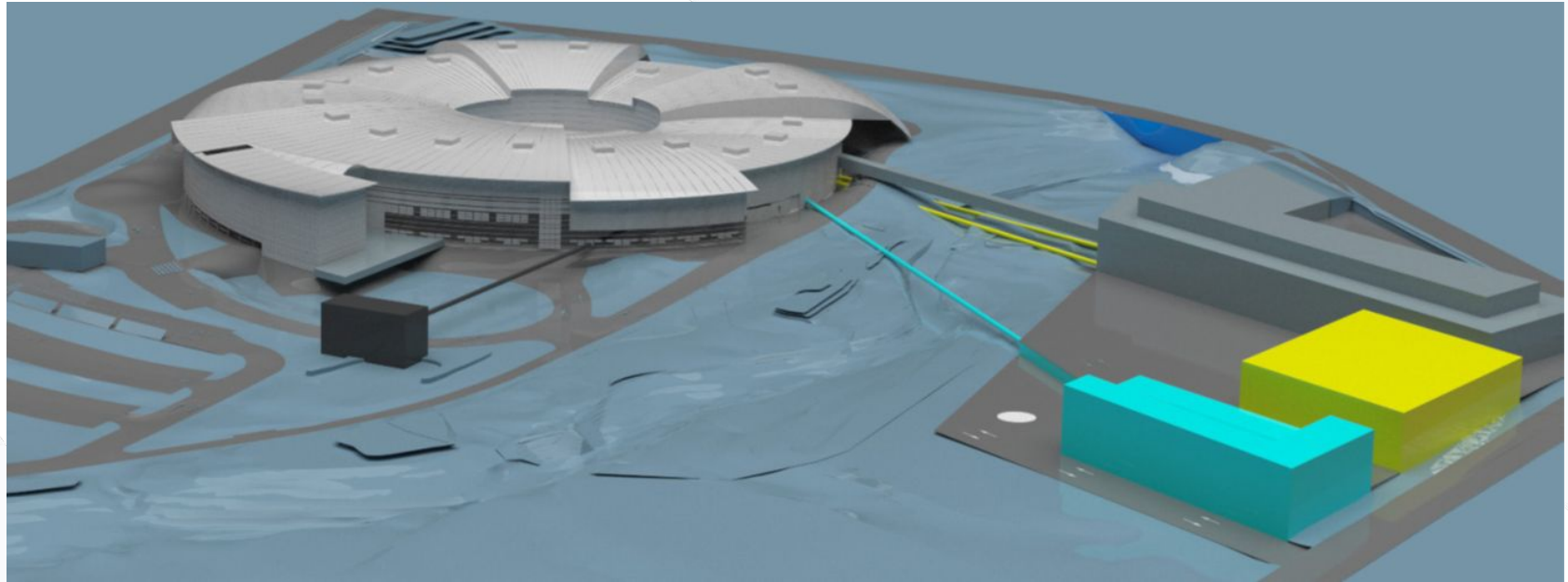
2022

- Funding for first ALBA II BL (10M€)
- New terrain plots assigned for Long Beamlines (16M€)

2023

- Proposals for Long Beamlines being evaluated
- White Paper ready for evaluation
- 1st ALBA II MAC held last week 22-23/June/2023
<https://indico.cells.es/event/1341/>

Dark Period foreseen for 2030-2031





Thank you all for your time

We will be happy to take your comments and questions