ALBA
SYNCHROTRON

ALBA Tango CS Status

27/June/2023

Outline

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

Team Updates

<2y

Jordi Aguilar Larruy
4097
jalarruy@cells.es

>8y

Fulvio Becheri
4340
fbecheri@cells.es
Is absent this morning

<2y

Martí Caixal Joaniquet
mcaixal@cells.es

<2y

José Gabriel Centeno Gabadinho
4041
jcenteno@cells.es

>8y

Guifré Cuní Soler
4415
gcuni@cells.es

>8y

Roberto Javier Homs Puron
4409
rhoms@cells.es
Is absent for a few hours

Student

Daniel Martínez Góngora
4563
dmartinez@axt.email

>8y

Jairo Moldes Fuentes
4339
jmoldes@cells.es

>2y

Emilio José Morales Alejandre
4089
emorales@cells.es

<2y

Miquel Navarro Fernández
4078
mnavarro@cells.es

<2y

Albert Ollé Sabaté
4057
aolle@cells.es

<2y

Jose Antonio Ramos Andrades
4417
jramos@cells.es

>8y

Zbigniew Reszela
4407
zreszela@cells.es

>8y

Alberto Rubio García
4462
arubio@cells.es

>8y

Sergio Rubio Manrique
4387
srubio@cells.es

>8y

Nil Serra Peinado
4377
nserra@cells.es

Student

Erik Tarruella Segura
4556
etarruella@axt.email

<2y

Oriol Vallcorba Valls
4363
ovallcorba@cells.es
Is absent today

>8y

Jorge Villanueva Cuenda
4392
jvillanueva@cells.es
Is absent today

<2y

Steven Wohl
4091
swohl@cells.es

>8 years: 9 people
>2 years: 1 person
Newcomers (<2y): 8 people
Students

Controls Section: 20 people (2 vacants)

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

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 were 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%

Current Status - Highlights - Deployment

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

Current Status - Highlights - ALBA II GUIs strategy

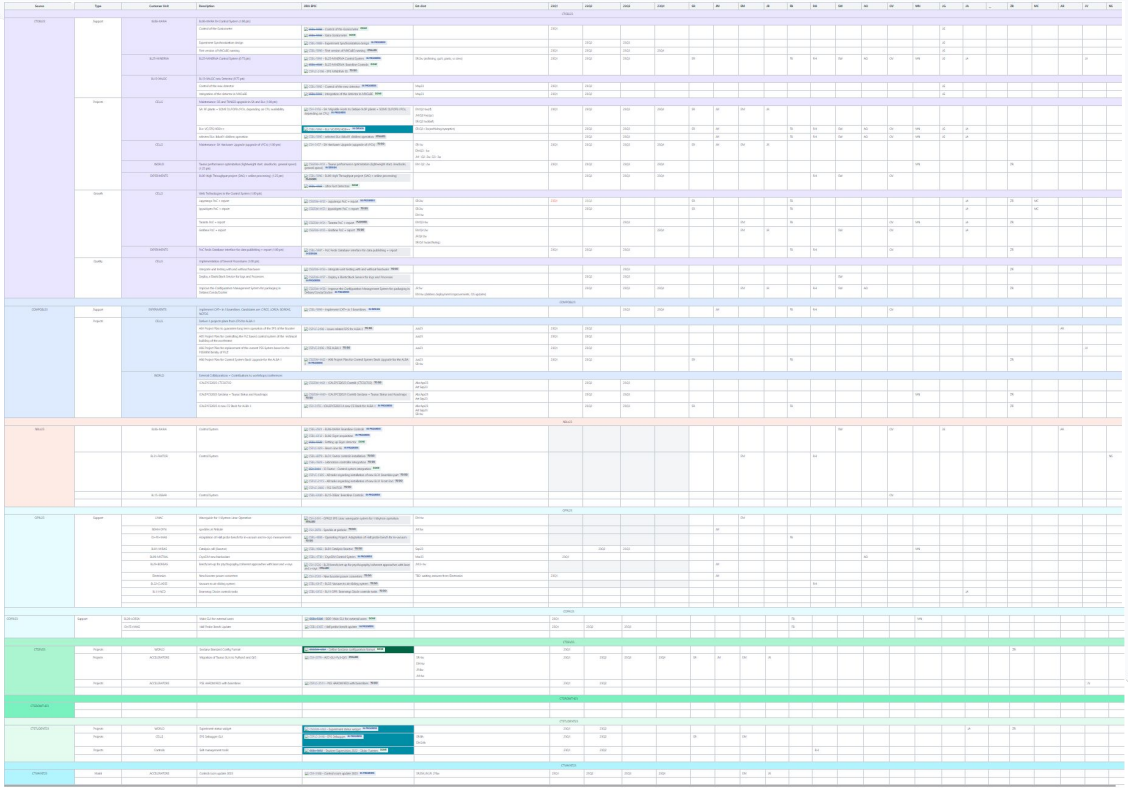
- Considering desktop applications, a priori, we don't see a need to replace Taurus, but we should invest time in **improving scalability and performance of Taurus GUIs**
- **Web** technologies needs to be explored **as a complementary solution** because of the cross-platform compatibility, reduced cost 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

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

Organization - Activities

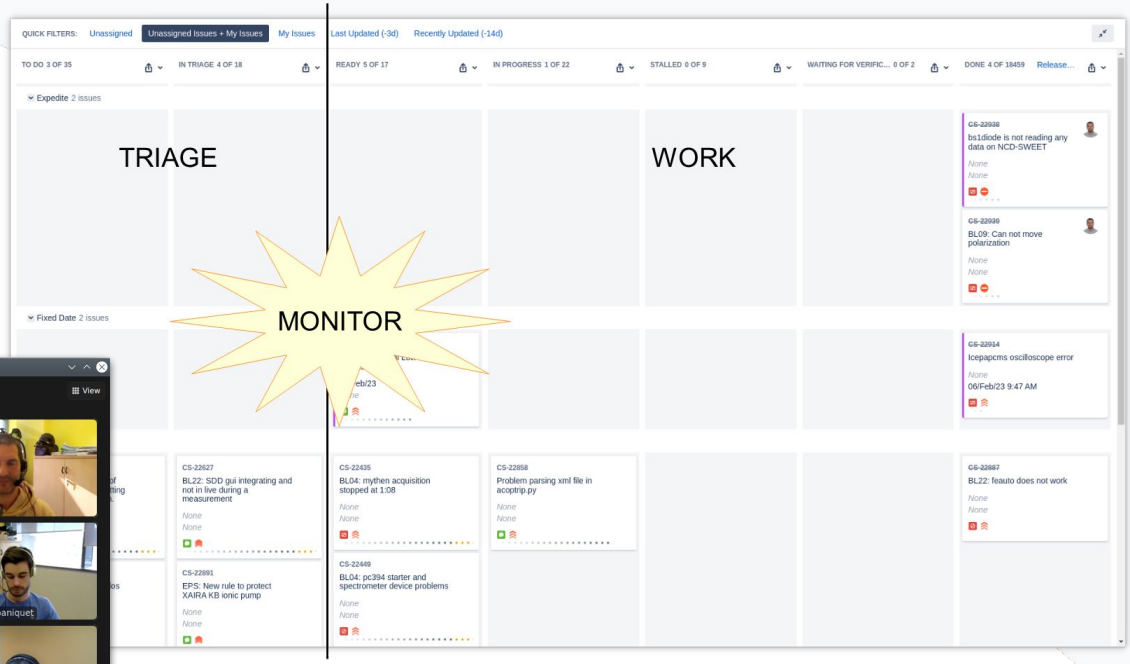
Sources for our developments

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



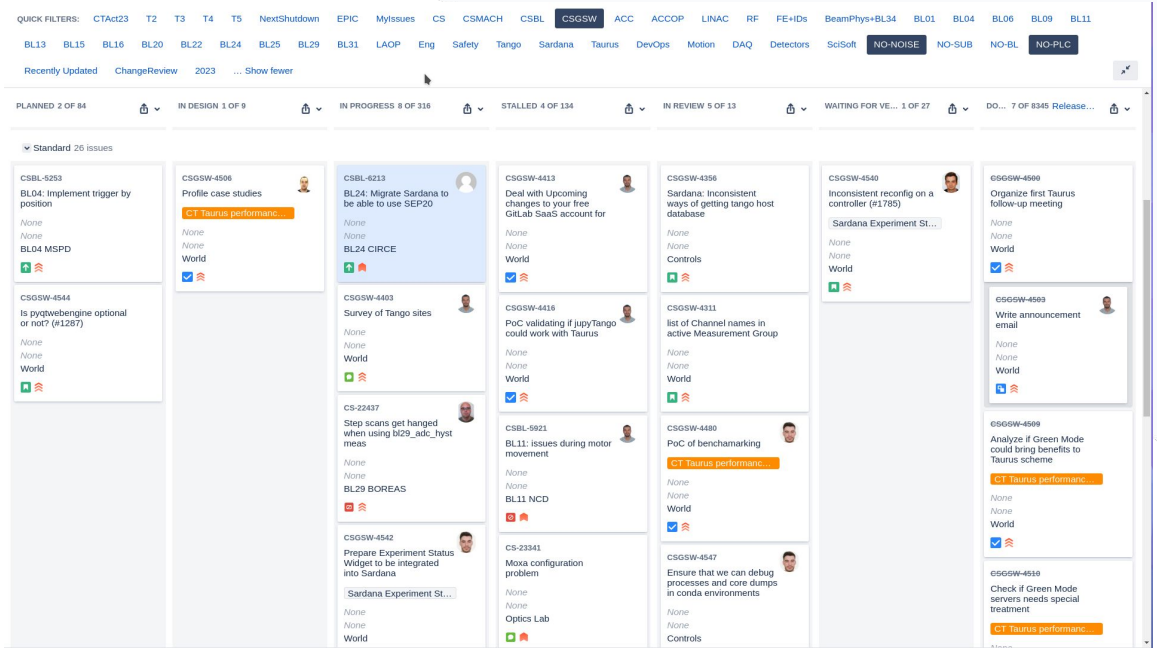
Organization - Service Support

- Operation days
- Rotating Role
- Shared Calendar



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



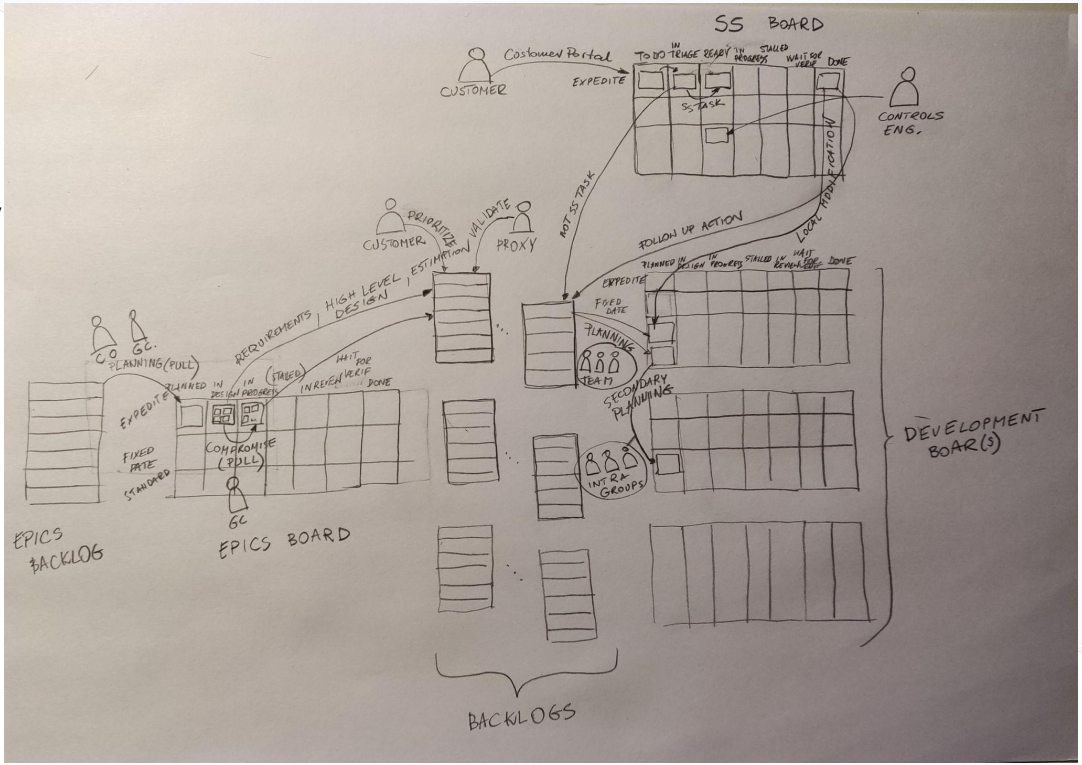
Organization - Big Picture

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)



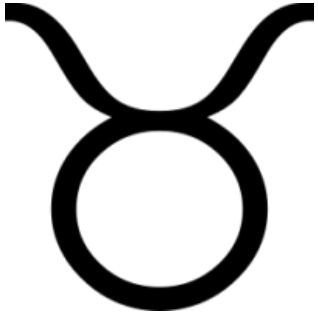
- Team updates
- Current Status - Highlights
- Organization of Activities
- Contributions to the Community
- ALBA II

Contributions - Tango & PyTango

- 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

Contributions - Taurus & Sardana

- 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



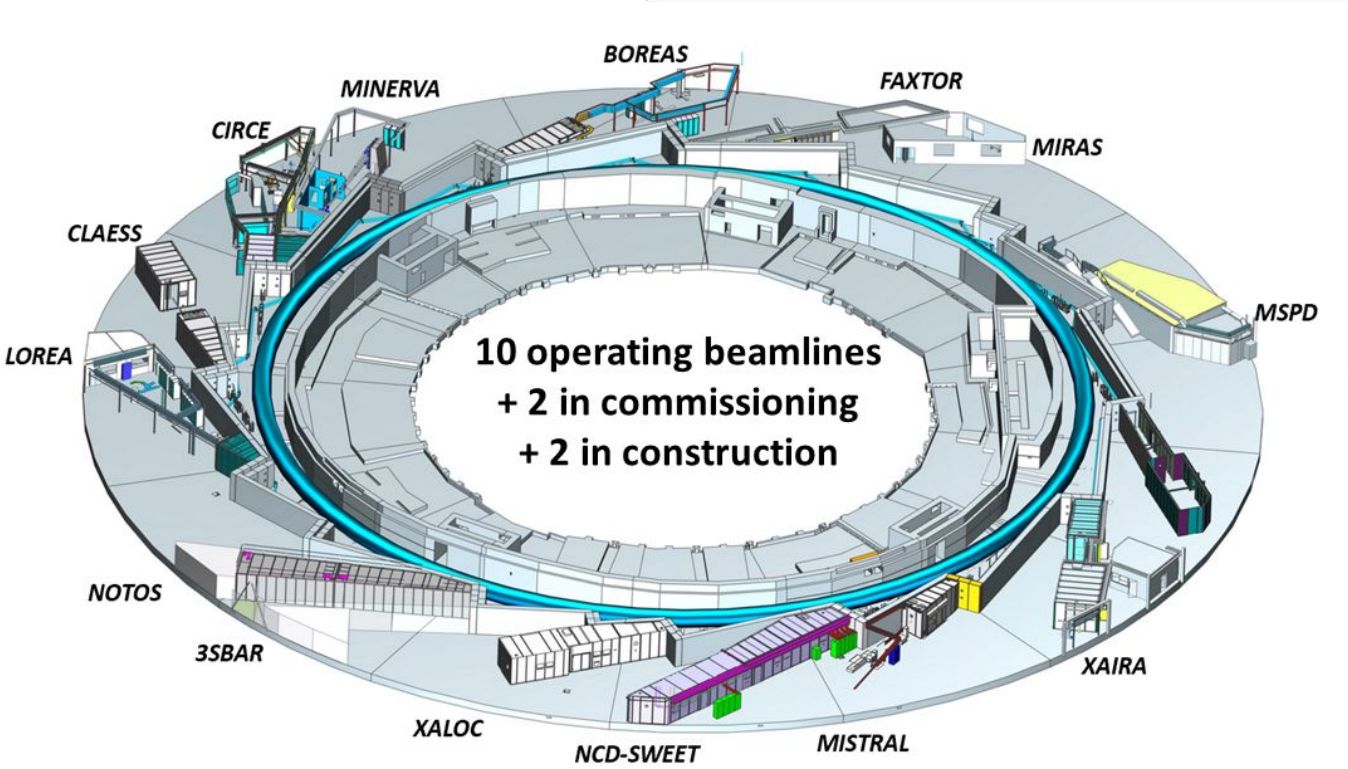
Contributions - HDB++ & Alarms

ALBA Developments presented in this Tango Meeting:

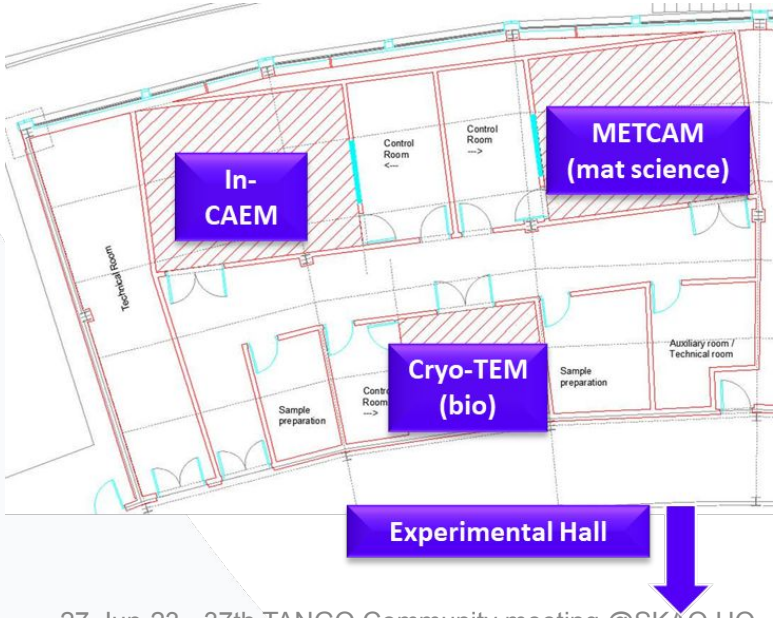
- TaurusTrend with HDB++ archiving support
- pyhdbpp library for python access to archiving data will be presented Tuesday afternoon
- Panic alarms and fandango utilities

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

- 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



Unió Europea
Fons Europeu de Desenvolupament Regional
Generalitat de Catalunya
Departament de Recerca i Universitats
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

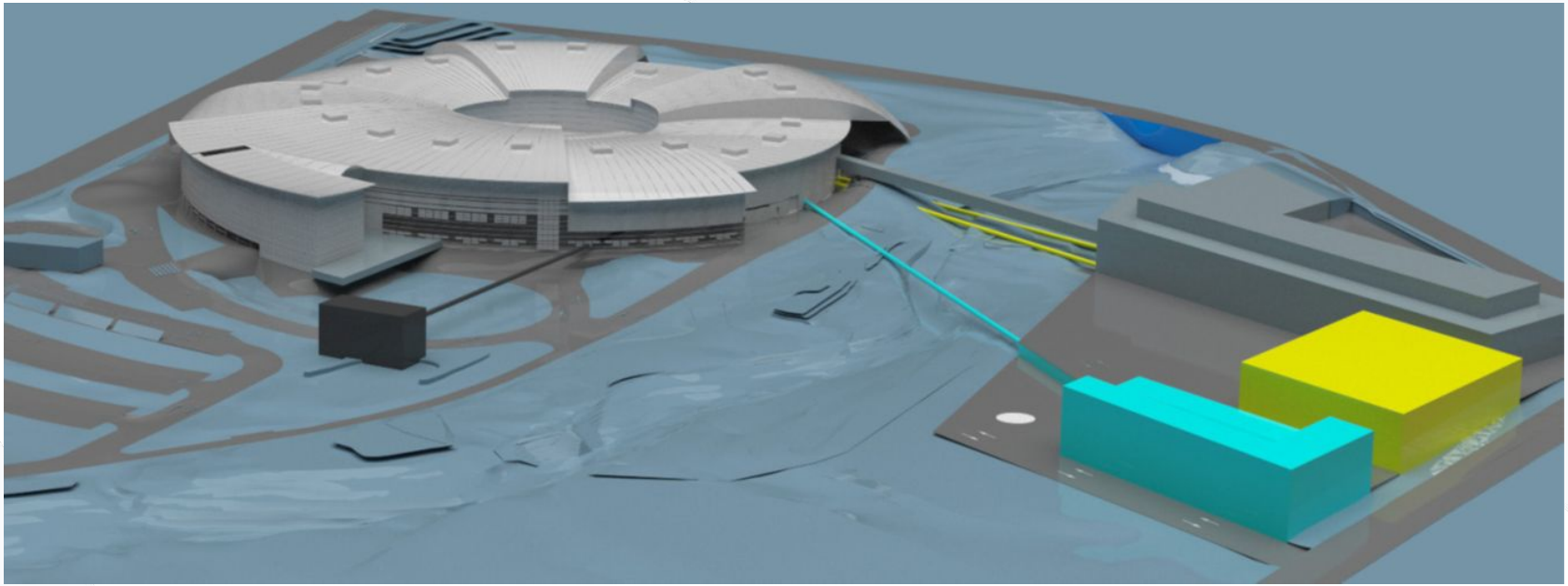
- Funding for first ALBA II BL (10M€)
- New terrain plots assigned for Long Beamlines (16M€)

2023

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

Dark Period foreseen for 2030-2031

ALBA II



ALBA SYNCHROTRON

Thank you all for your time

We will be happy to take your comments and questions