



Software Upgrades of Beam and Irradiation Test Infrastructures in AIDA-2020

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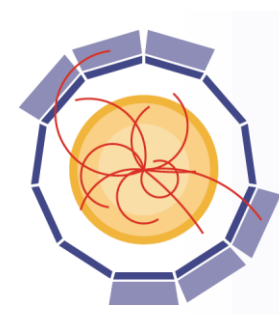
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AIDA 2020

Software Upgrades of Beam and Irradiation Test Infrastructures in AIDA-2020



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ABSTRACT

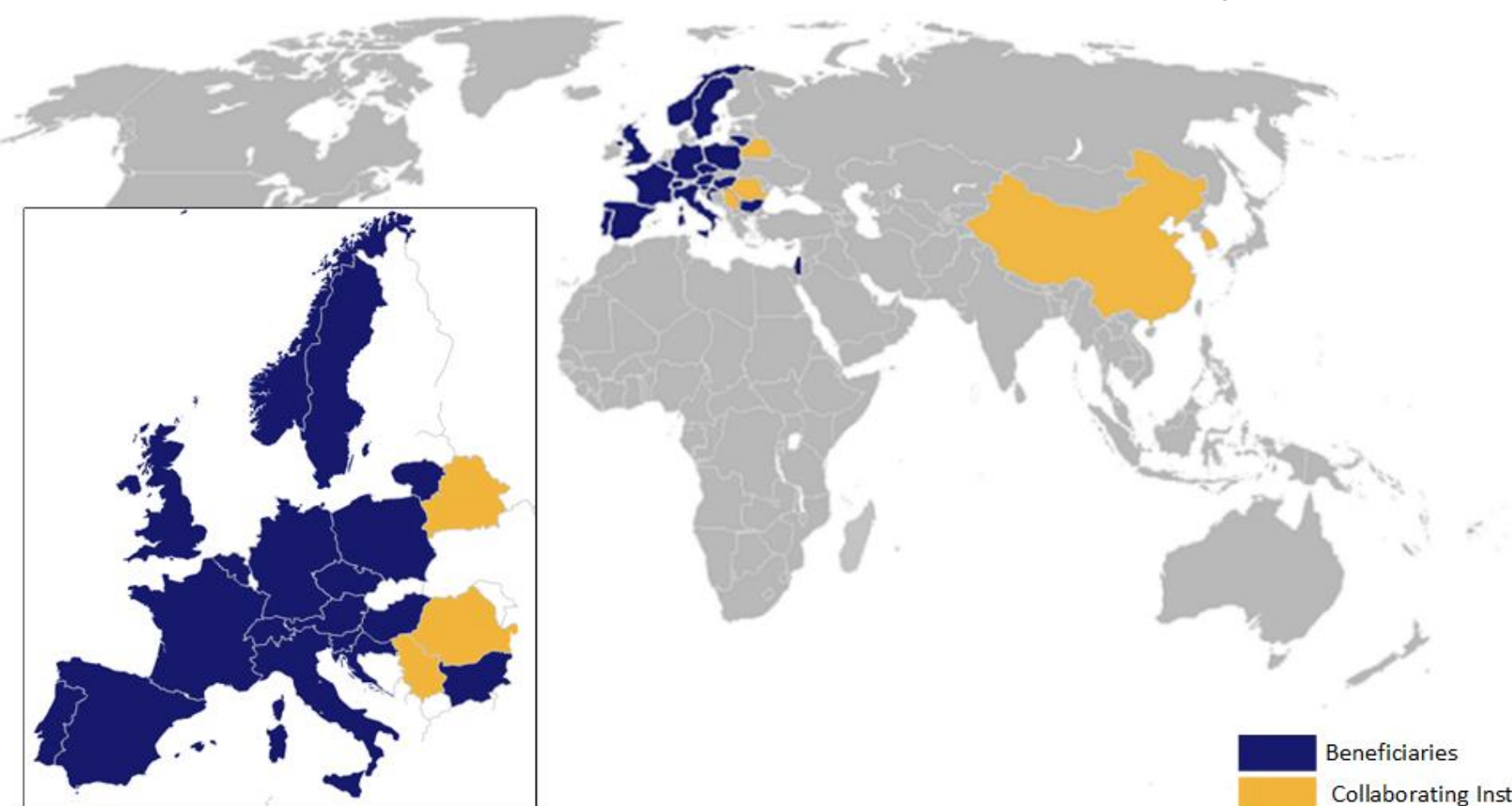
AIDA-2020 is an EU-funded project about Advanced European Infrastructures for Detectors at Accelerators involving about 60 institutes in 24 EU countries. Within this project, the Work Package 15 (WP15) deals with beam and irradiation test facilities, infrastructures dedicated to the qualification of particle detectors, materials, and components prior to their installation in High-Energy Physics (HEP) experiments. In this paper, we

present the contributions of our team at CERN to the WP15 activities.

These activities involve **online databases of irradiation and test beam facilities**, a dedicated **web application for the data management** of the CERN proton irradiation facility (IRRAD) and an **ontology for irradiation experiments and their data management (IEDM)**.

AIDA-2020

Advanced European Infrastructures for Detectors at Accelerators (AIDA-2020) is an EU-funded project that unites important European research infrastructures in the field of detector development and testing.



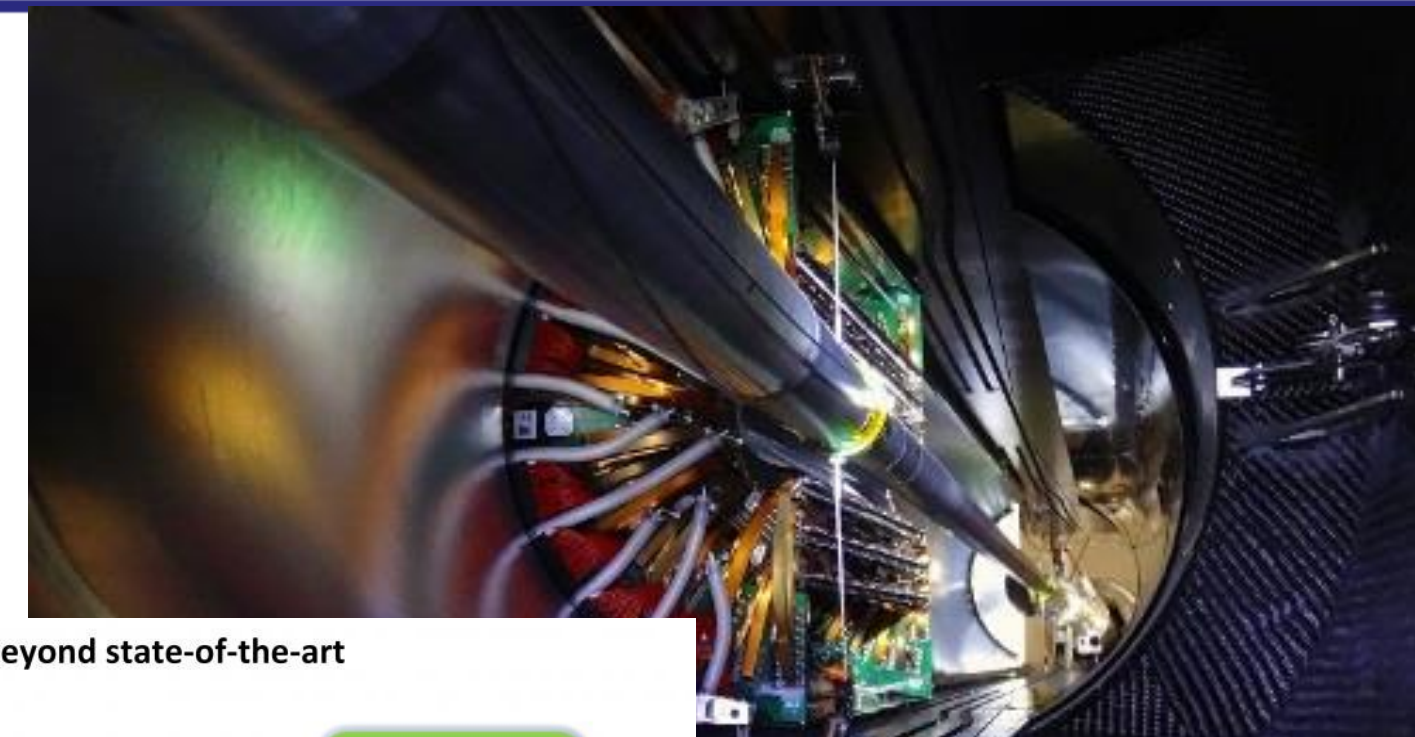
Map of participant countries involved in AIDA-2020



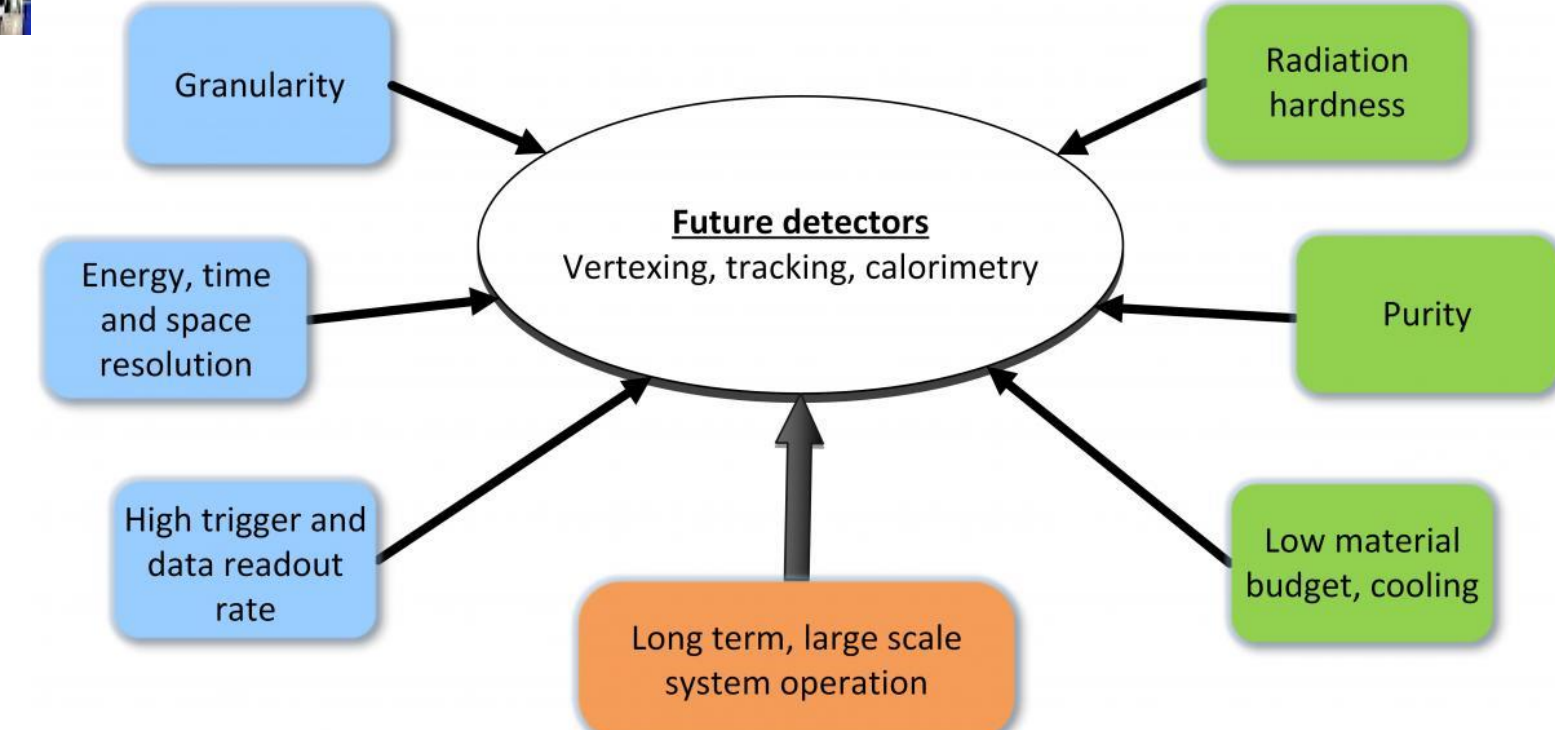
<http://aida2020.web.cern.ch/content/newsletter>



CMS Pixel Detector



View of the ATLAS calorimeters from below

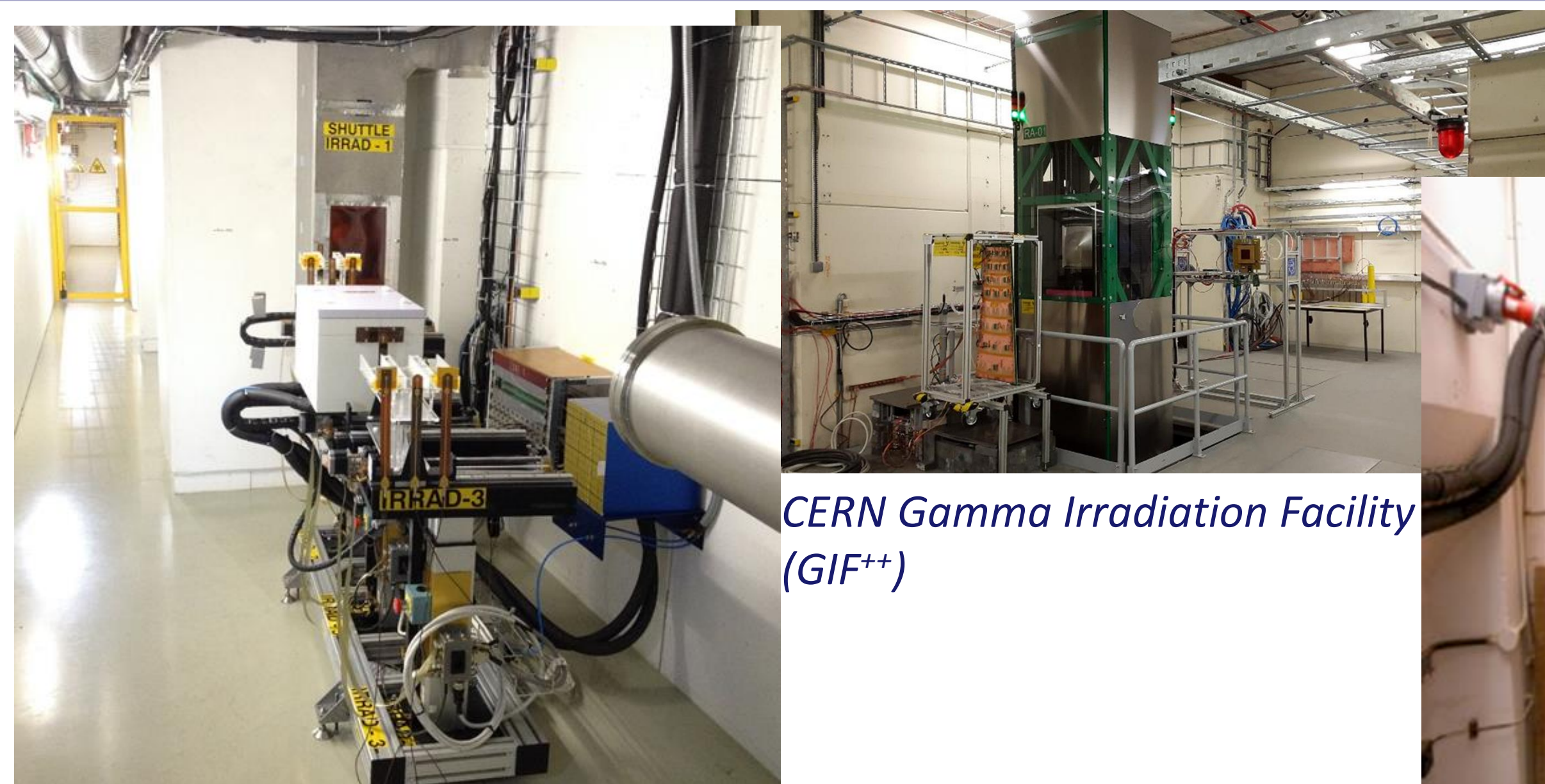


AIDA-2020 WP15 Goals

Beam and irradiation test facilities:

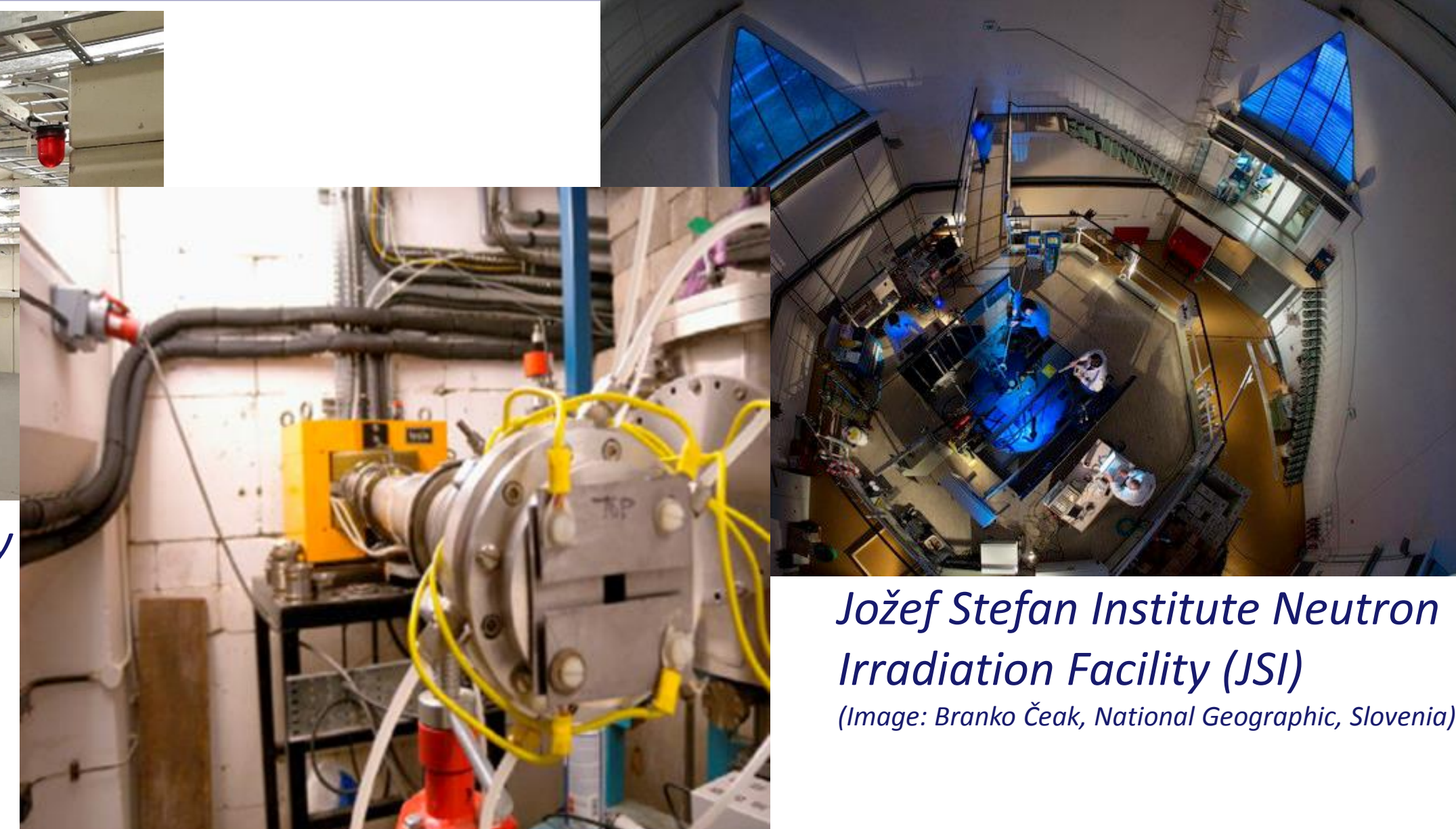
Infrastructures for the qualification of Particle detectors, materials, and components prior to their installation in High-Energy Physics (HEP) experiments such as those performed at CERN.

AIDA-2020 Work Package 15 (WP15) is involved in the improvement of the beam and irradiation test facilities infrastructures.



CERN Proton Irradiation Facility (IRRAD)

CERN Gamma Irradiation Facility (GIF++)



Jožef Stefan Institute Neutron Irradiation Facility (JSI)
 (Image: Branko Ček, National Geographic, Slovenia)

Birmingham Proton Irradiation Facility

Software Development Activities in WP15

Databases of irradiation and test beam facilities:

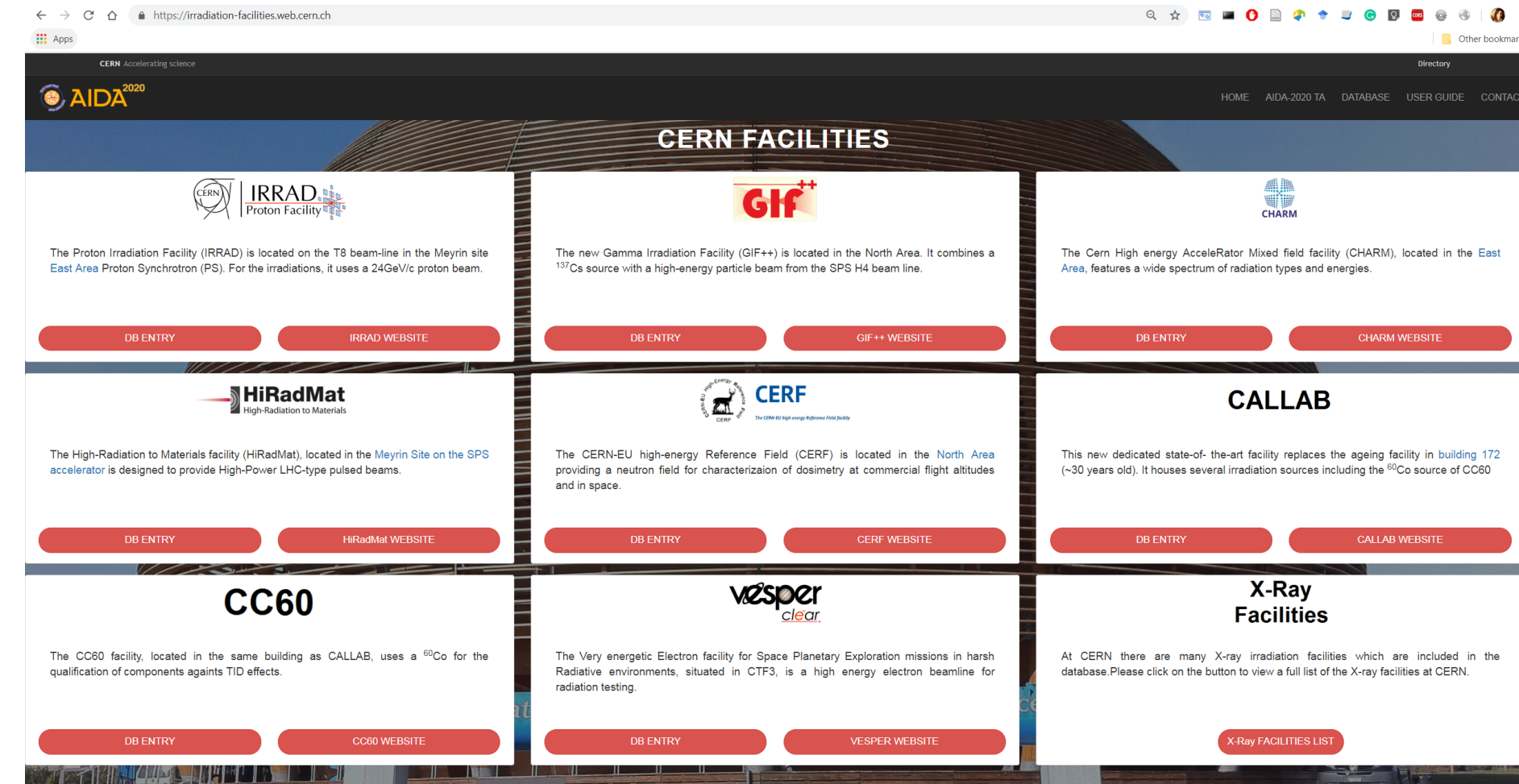
Online web application containing information about irradiation and test beam facilities.

<http://cern.ch/irradiation-facilities>

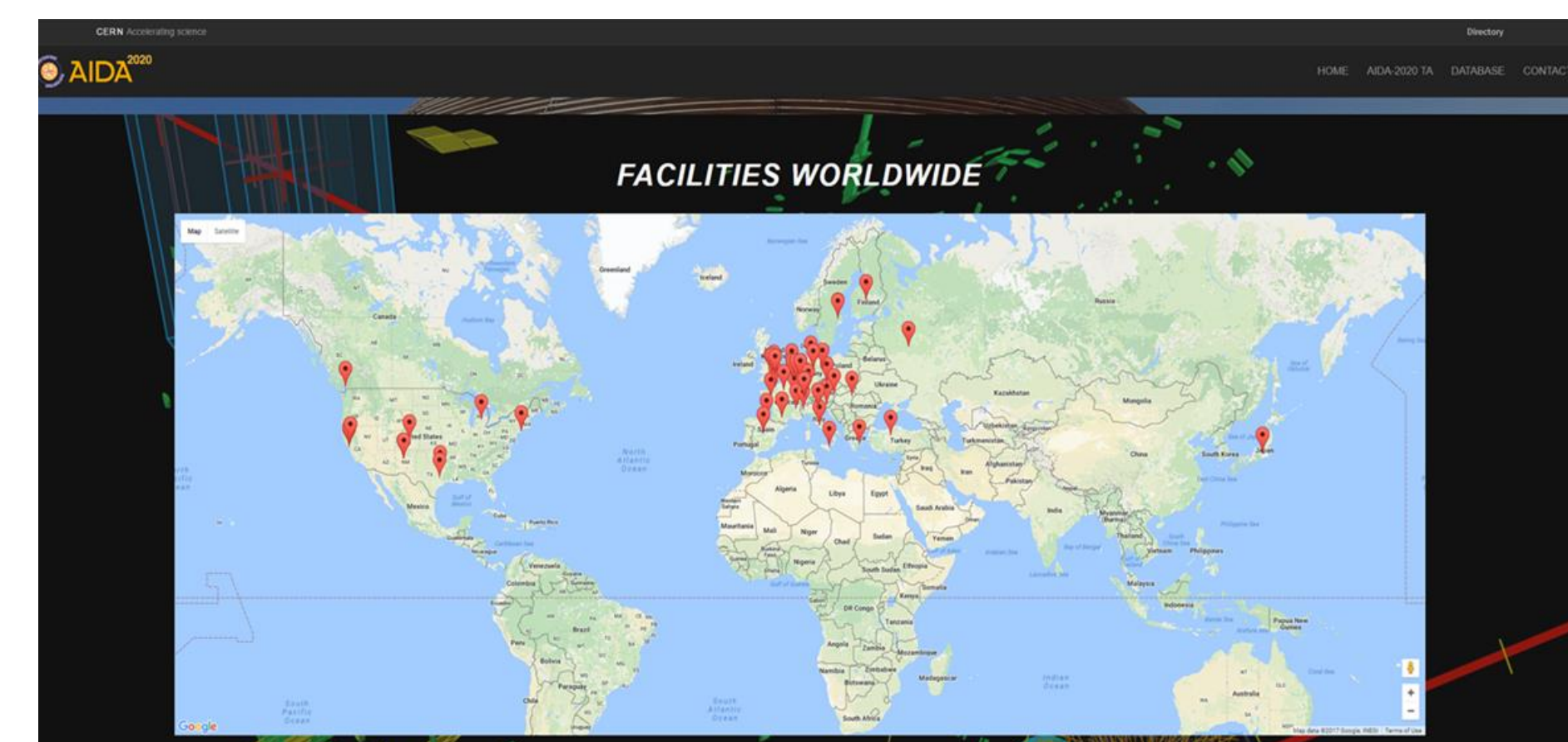


Data:

- Facility coordinator
- Institute
- Facility data
- Irradiation conditions
- Safety
- Accessibility
- Additional information



CERN Irradiation Facilities

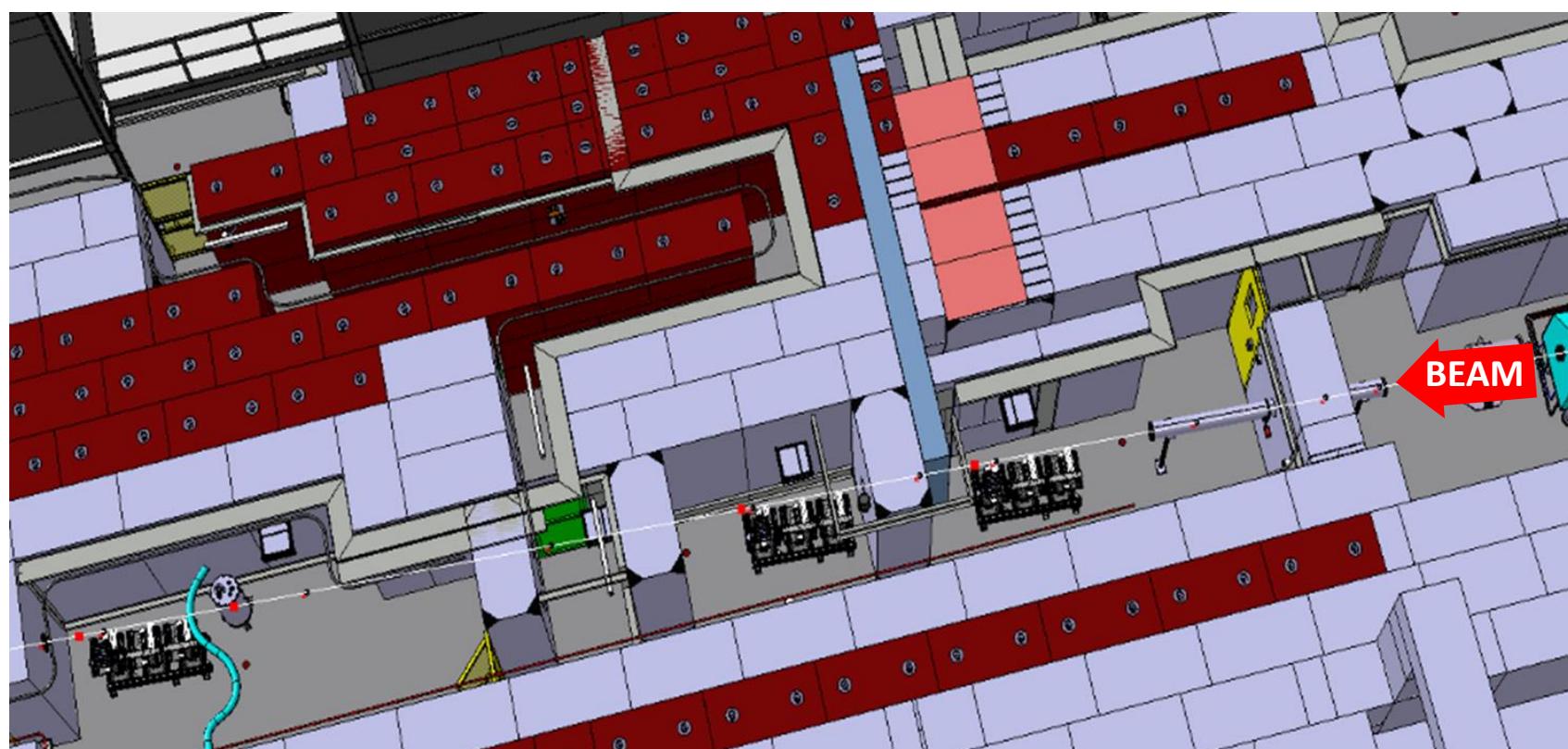


Worldwide Irradiation Facilities

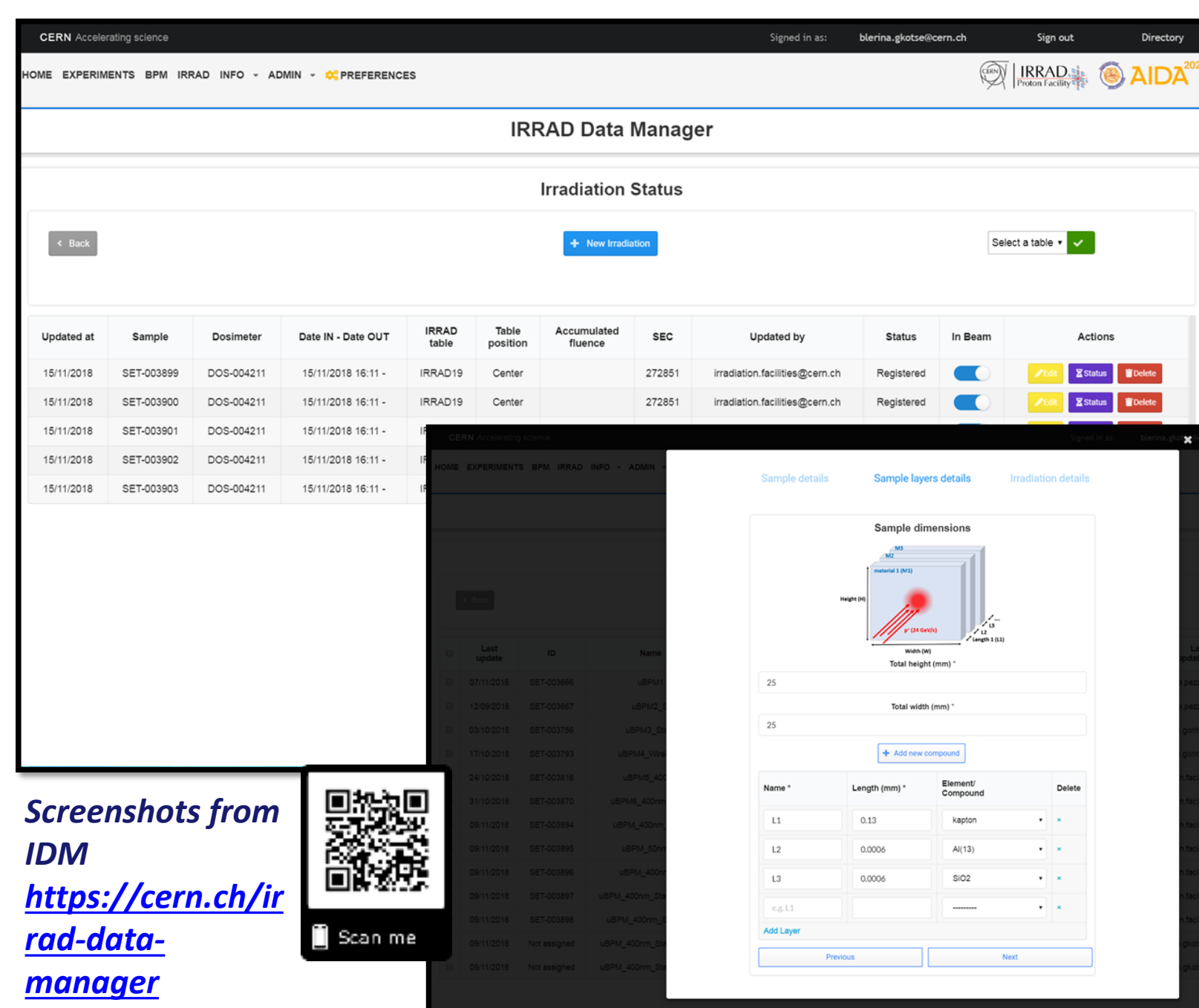
IRRAD Data Manager (IDM):

A data management web application used in the Proton Irradiation Facility at CERN (IRRAD)

- Experiments, samples, users and dosimeters registration
- Real-time follow-up of irradiation experiments
- Computation of proton interaction parameters
- Display and archive of dosimetry results
- User Interface preferences customization
- History and details of past experiments (with user permission)



CERN Proton Irradiation Facility area (IRRAD)

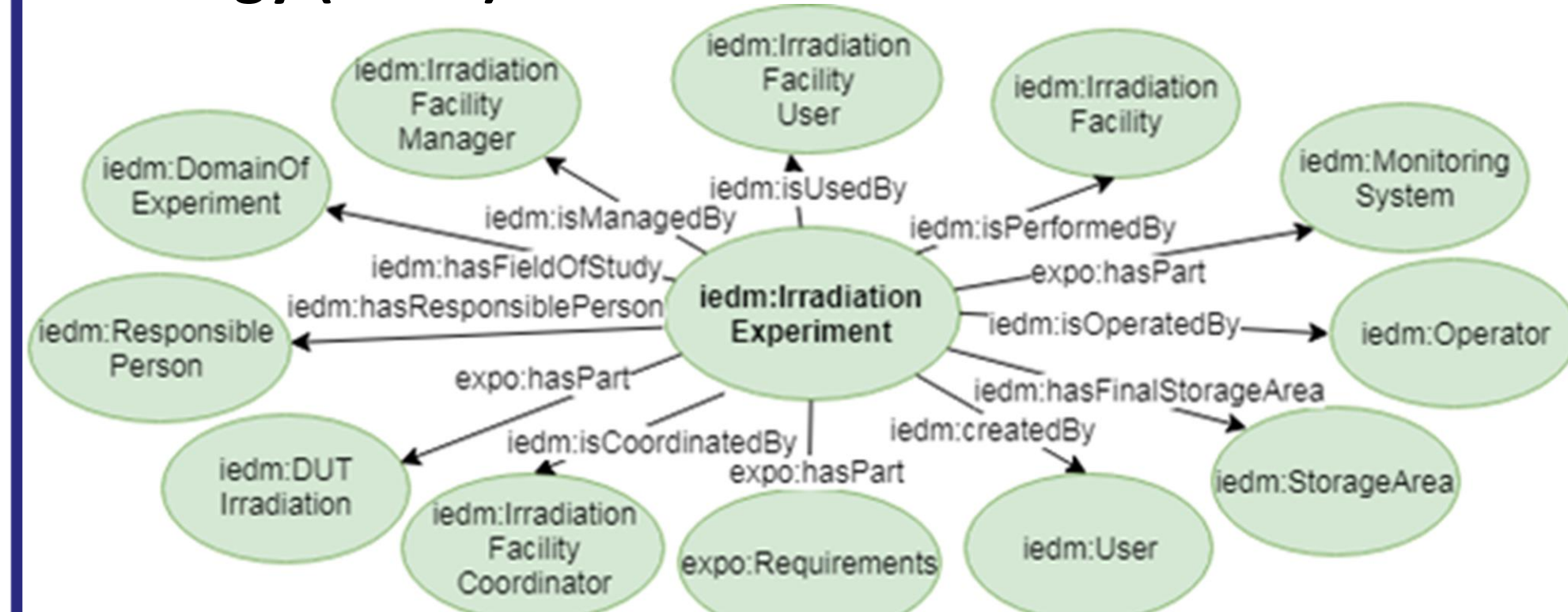


Screenshots from IDM
<https://cern.ch/irrad-data-manager>

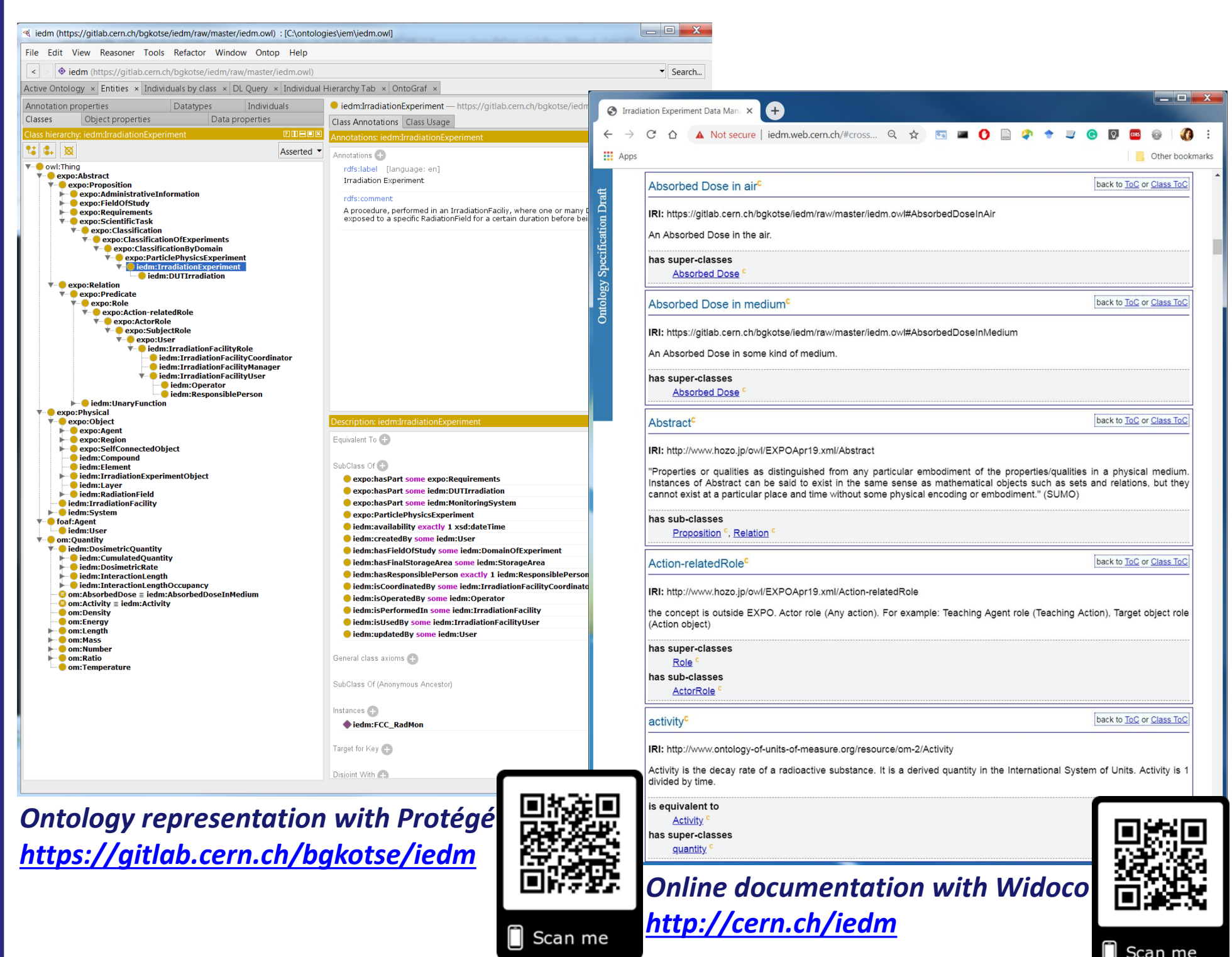


Irradiation Experiment Data Management ontology (IEDM):

IEDM includes concepts of data management of irradiation experiments extending classes from the **Ontology of Scientific Experiments (EXPO)**, the **Units of Measure ontology (OM)** and the **Friend-of-a-Friend ontology (FOAF)**.



Graph representation of some core IEDM entities and properties



Ontology representation with Protégé
<https://gitlab.cern.ch/bqkotse/iedm>



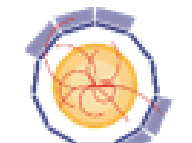
Online documentation with Widoco
<http://cern.ch/iedm>



<http://cern.ch/aida2020>



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