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

Blerina Gkotse[1,2], Georgi Gorine[1], Pierre Jouvelot[2], Isidre Mateu[1], Giuseppe Pezzullo[1], Federico Ravotti[1]

✉ Blerina.Gkotse@cern.ch
www.linkedin.com/in/blerinagkotse

[1] European Organization for Nuclear Research, CERN EP-DT-DD, Geneva, Switzerland
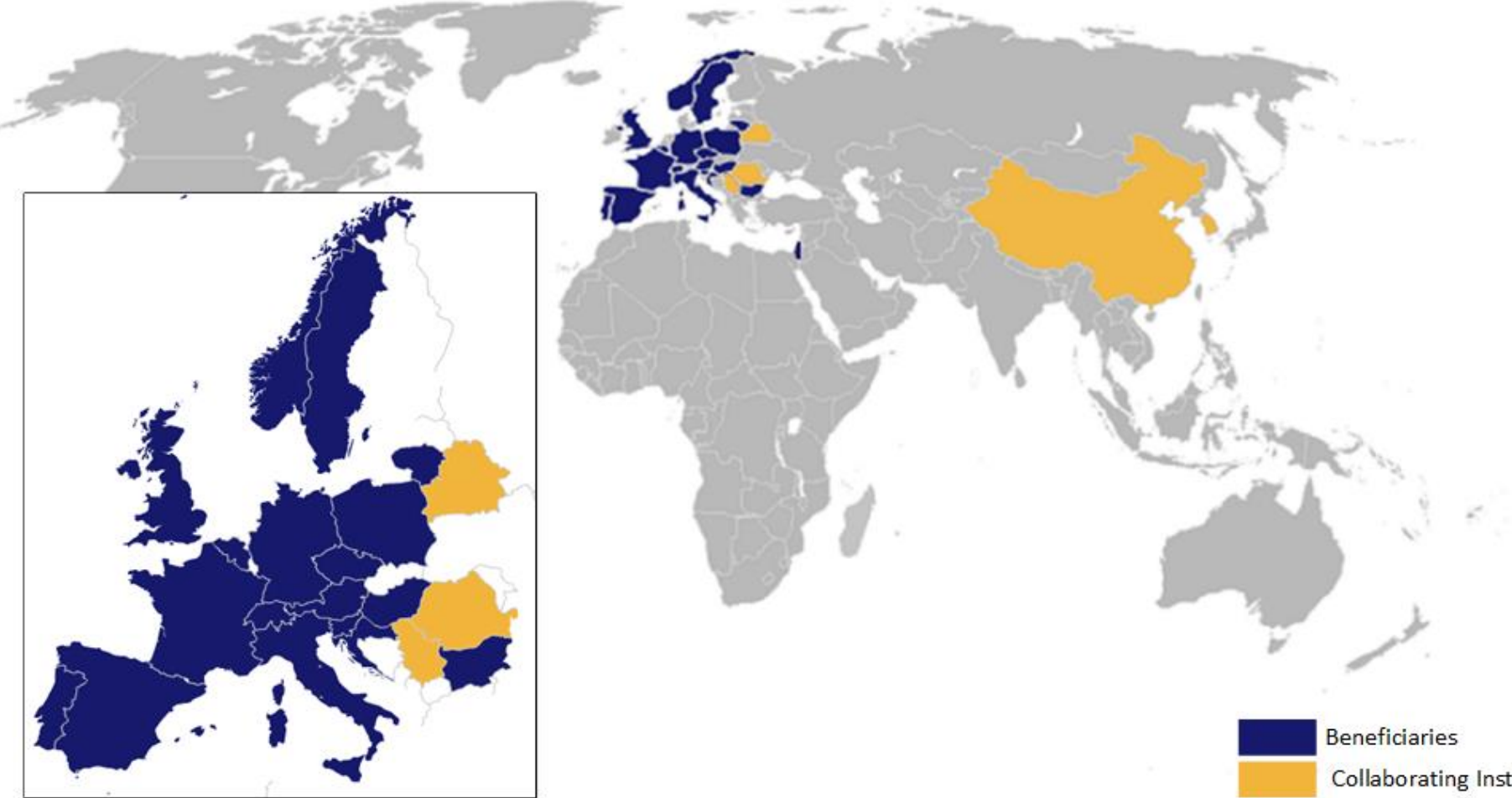[2] MINES ParisTech, PSL University, Paris, France

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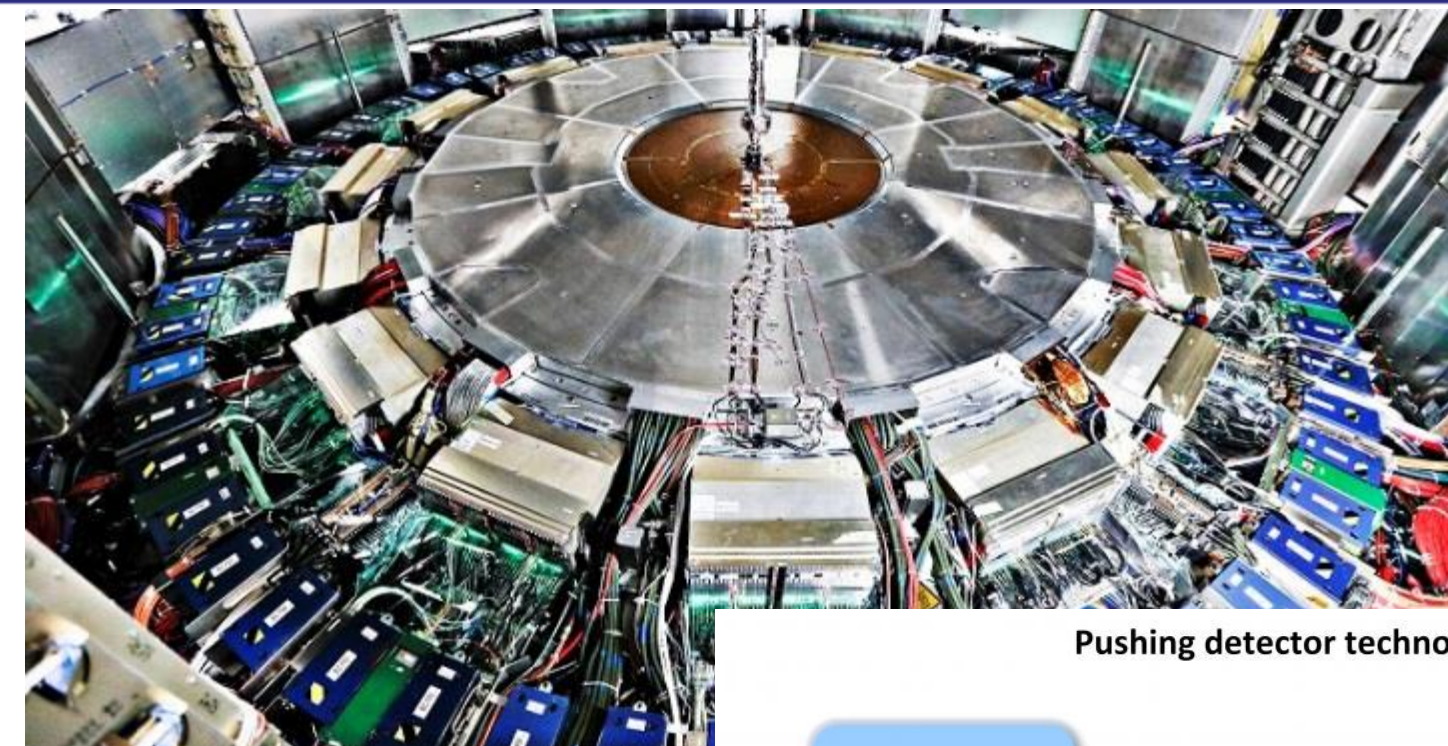
These activities involve **online databases of irradiation and test beam facilities**, a dedicated **web application for the data management** of the CERN proton irradiation facility (IRRAD) and **an ontology for irradiation experiments and their data management (IEDM).**

## 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*

Beneficiaries
Collaborating Institutes


*CMS Pixel Detector*


*View of the ATLAS calorimeters from below*

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


Pushing detector technologies beyond state-of-the-art
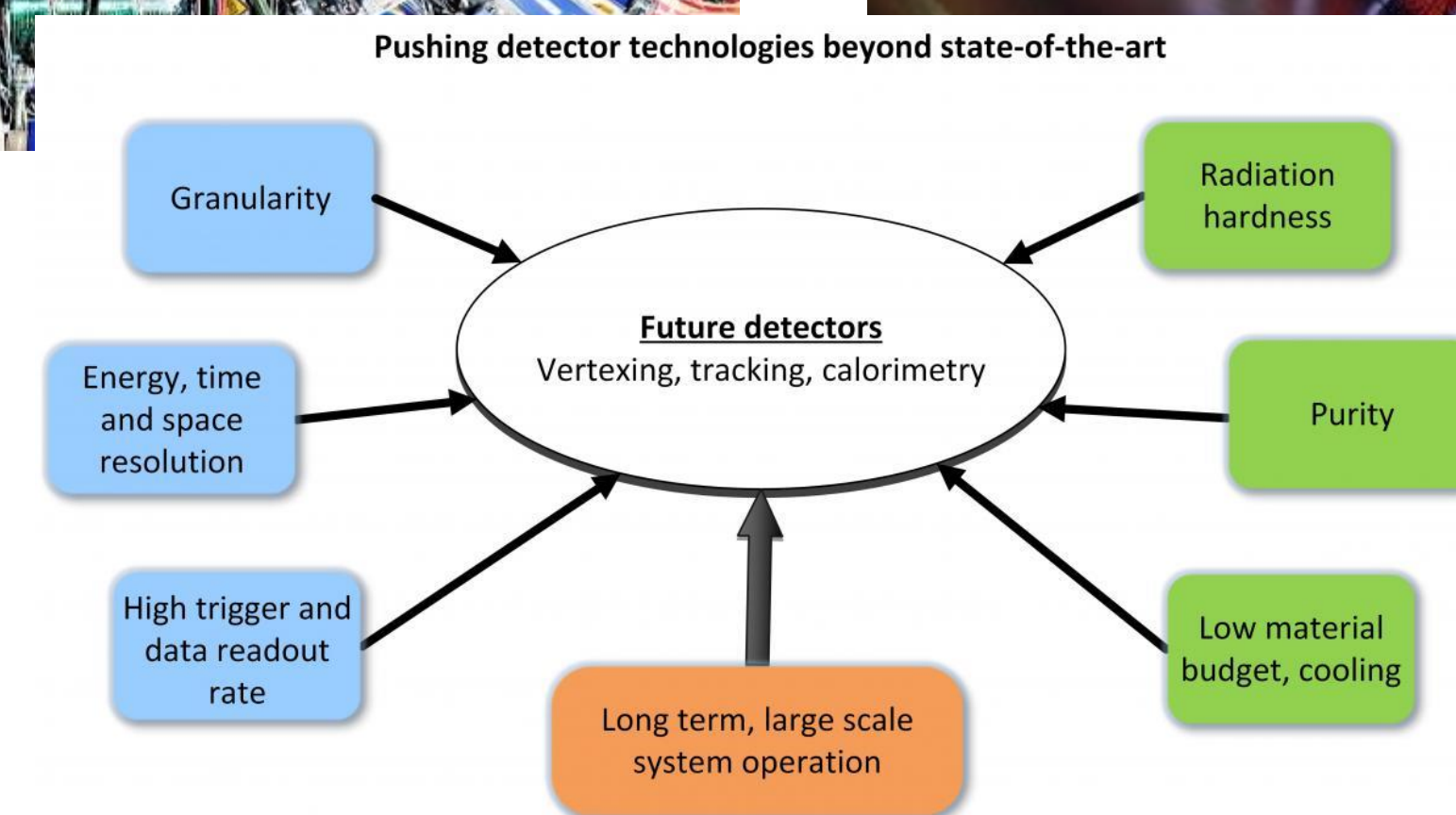
## AIDA-2020 WP15 Goals

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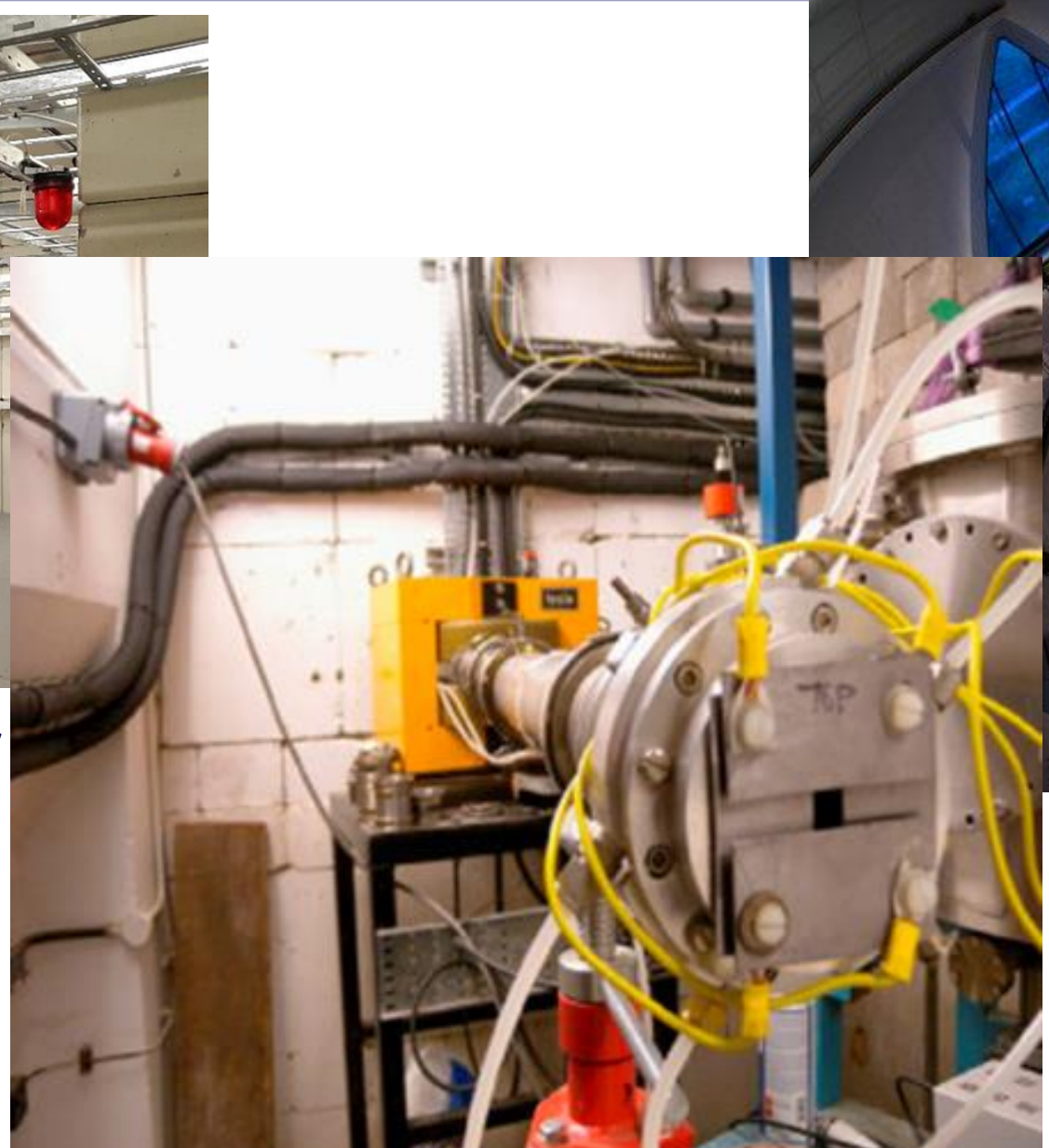
**AIDA-2020 Work Package 15 (WP15)** is involved in the improvement of the beam and irradiation test facilities infrastructures.


*CERN Proton Irradiation Facility (IRRAD)*


*CERN Gamma Irradiation Facility (GIF++)*


*Birmingham Proton Irradiation Facility*


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

## Software Development Activities in WP15

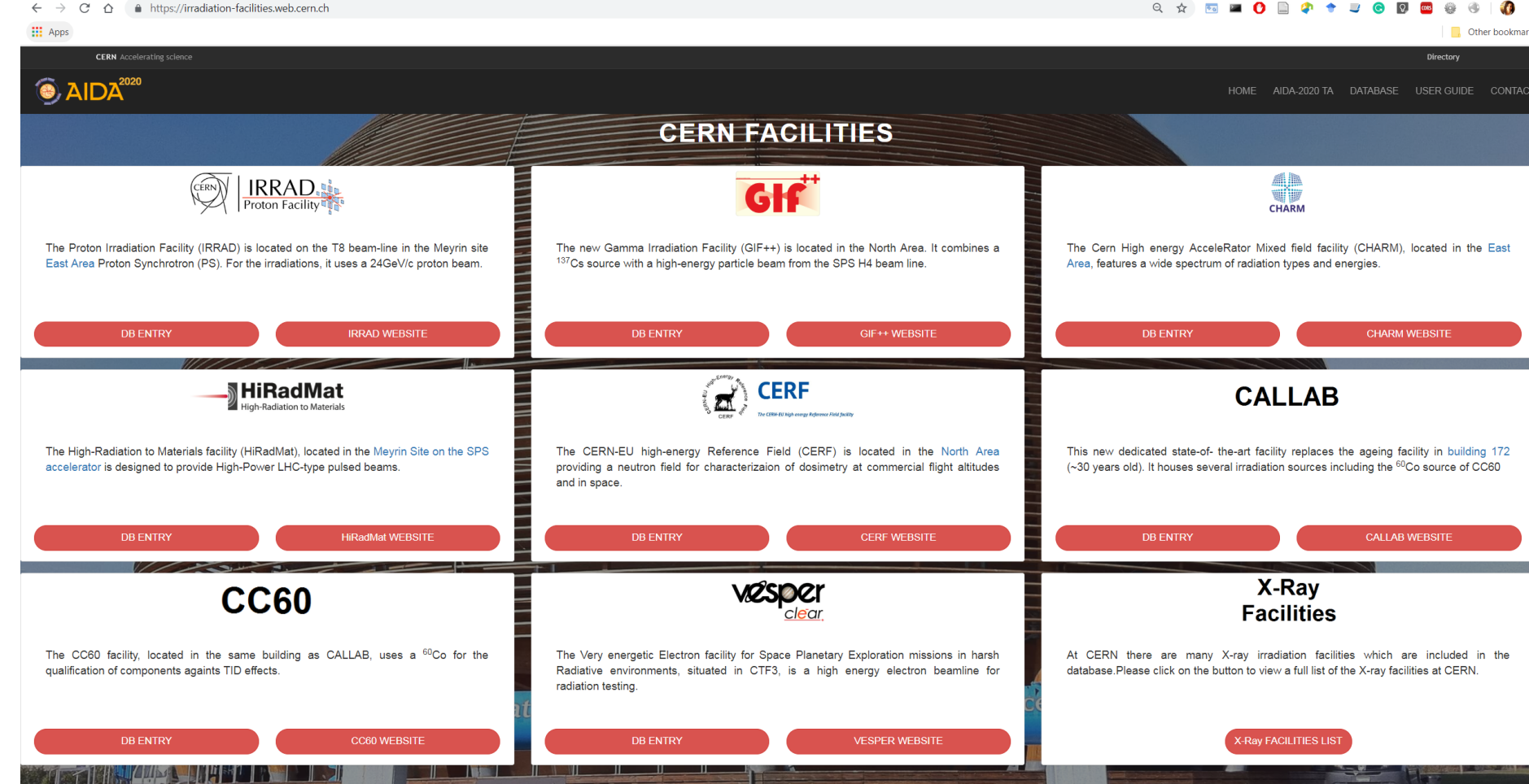**Databases of irradiation and test beam facilities:** Online web application containing information about irradiation and test beam facilities.
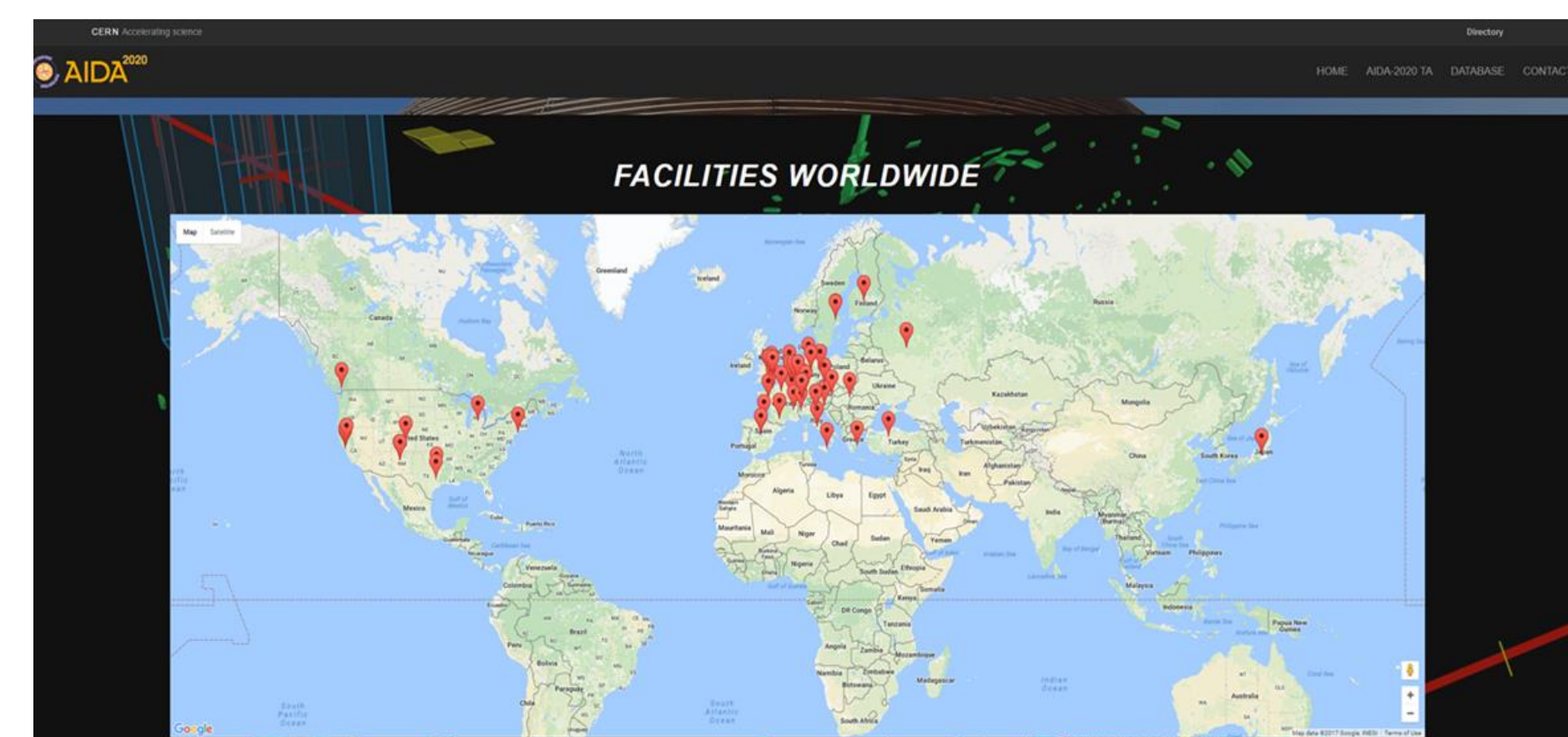
*http://cern.ch/irradiation-facilities*

**Data:**
- Facility coordinator
- Institute
- Facility data
- Irradiation conditions
- Safety
- Accessibility
- Additional information
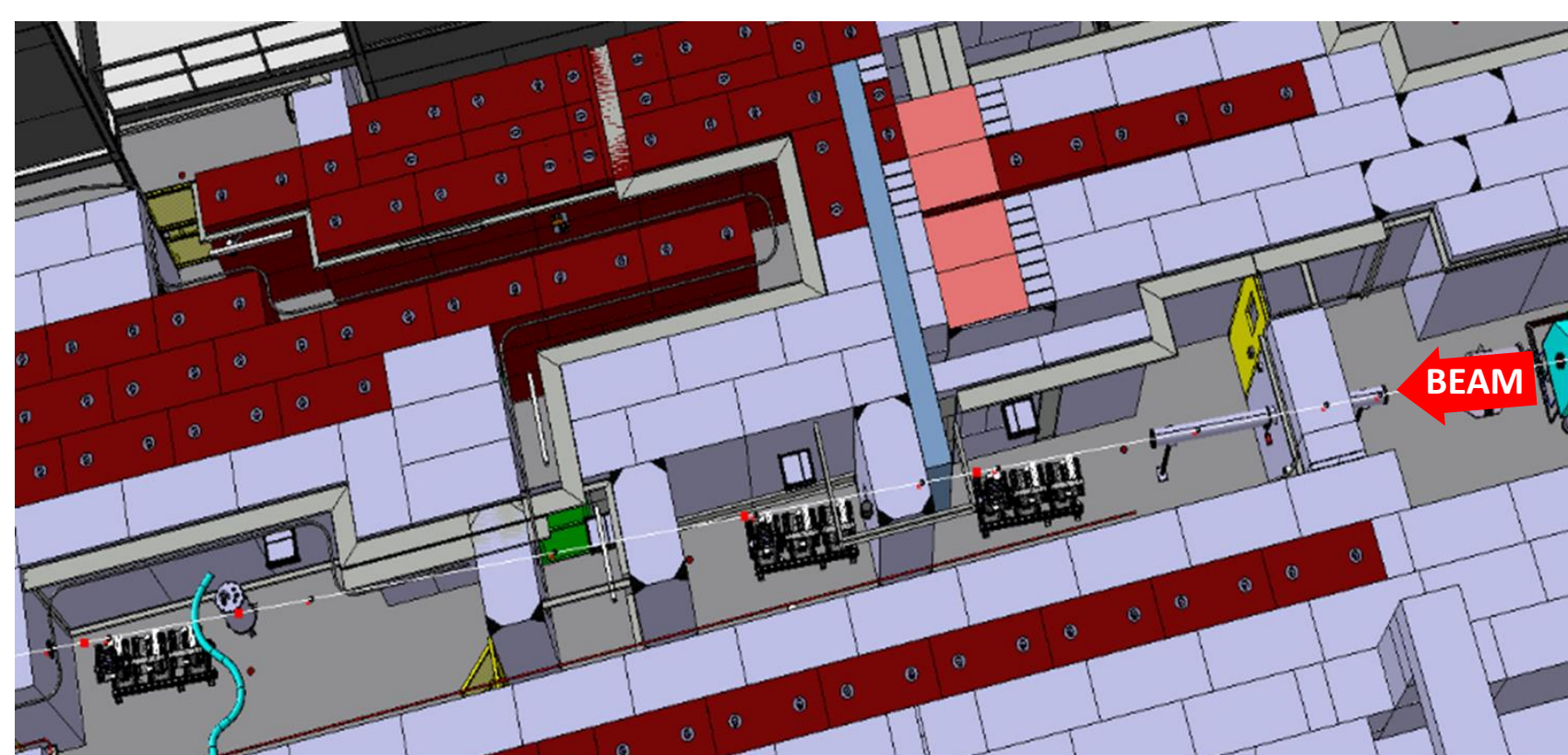

*CERN Irradiation Facilities*
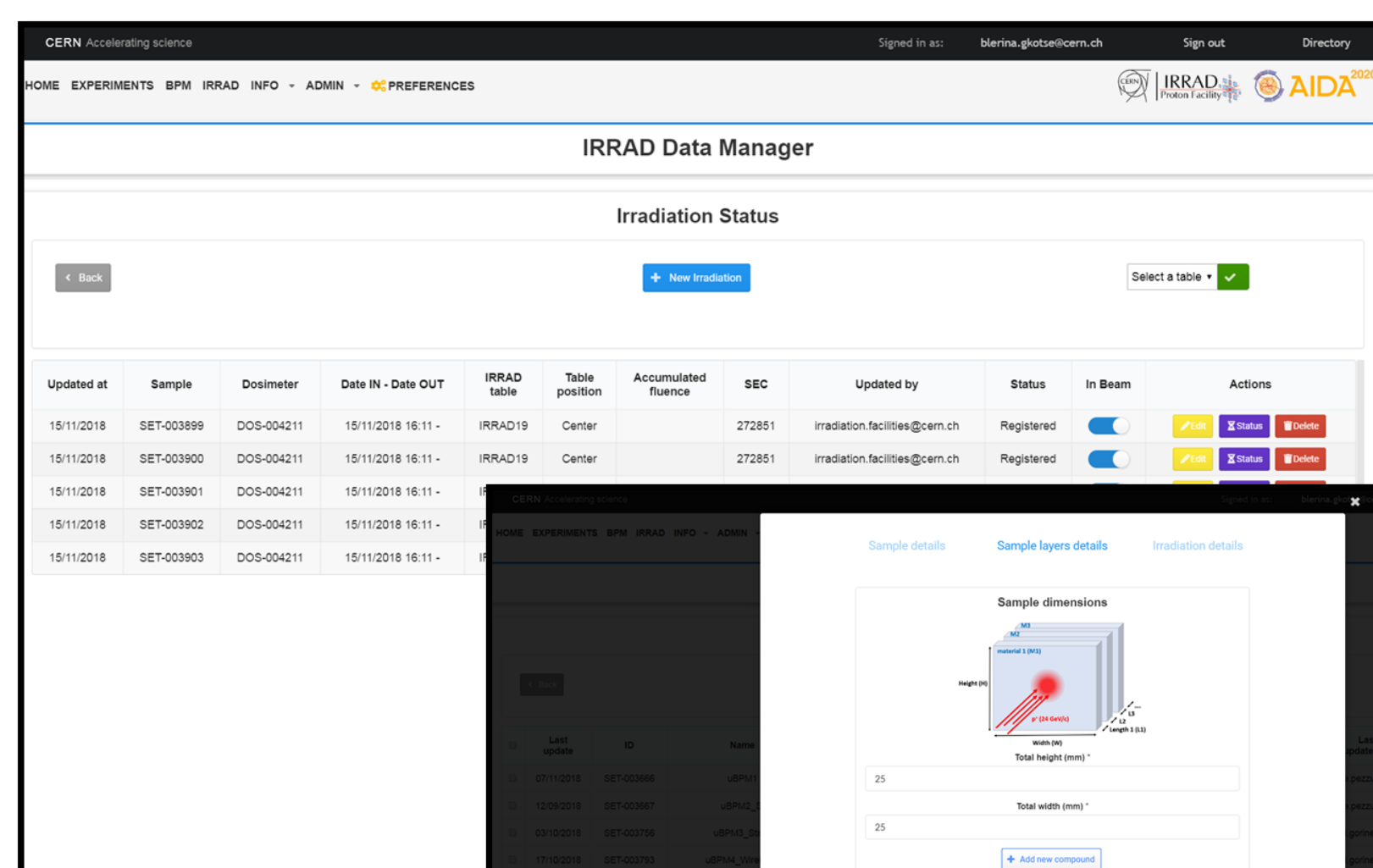

*Worldwide Irradiation Facilities*

**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)


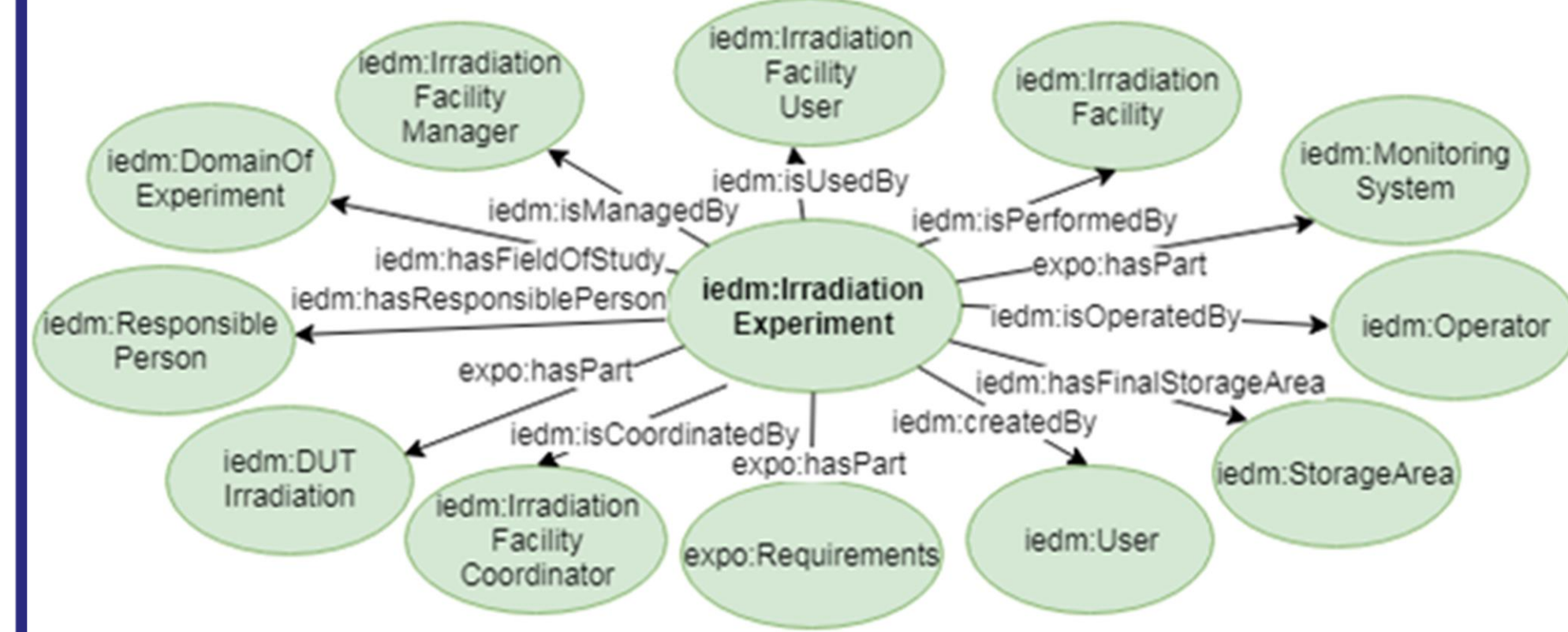*CERN Proton Irradiation Facility area (IRRAD)*


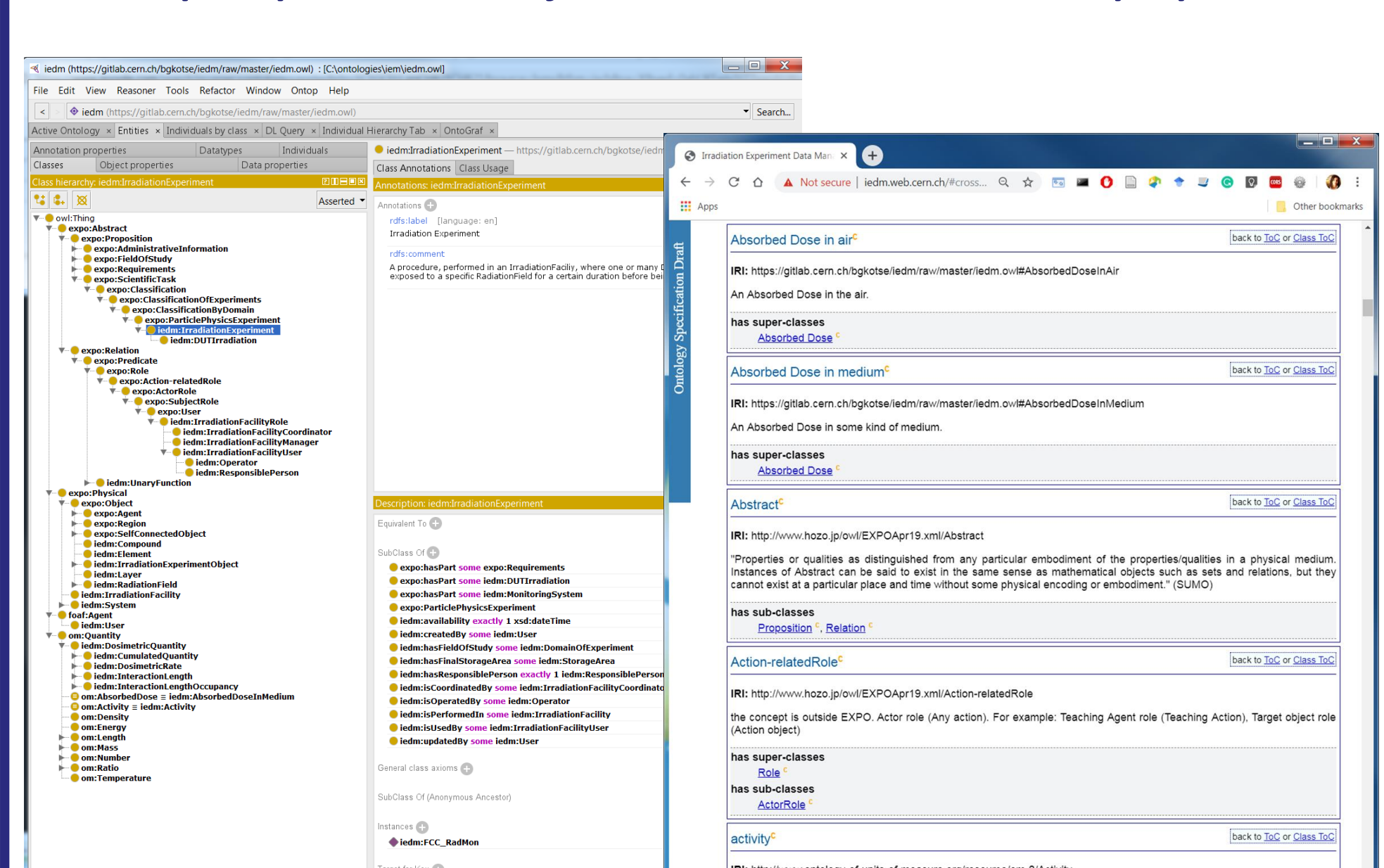*Screenshots from IDM https://cern.ch/irrad-data-manager*

**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/bgkotse/iedm*

*Online documentation with Widoco http://cern.ch/iedm*