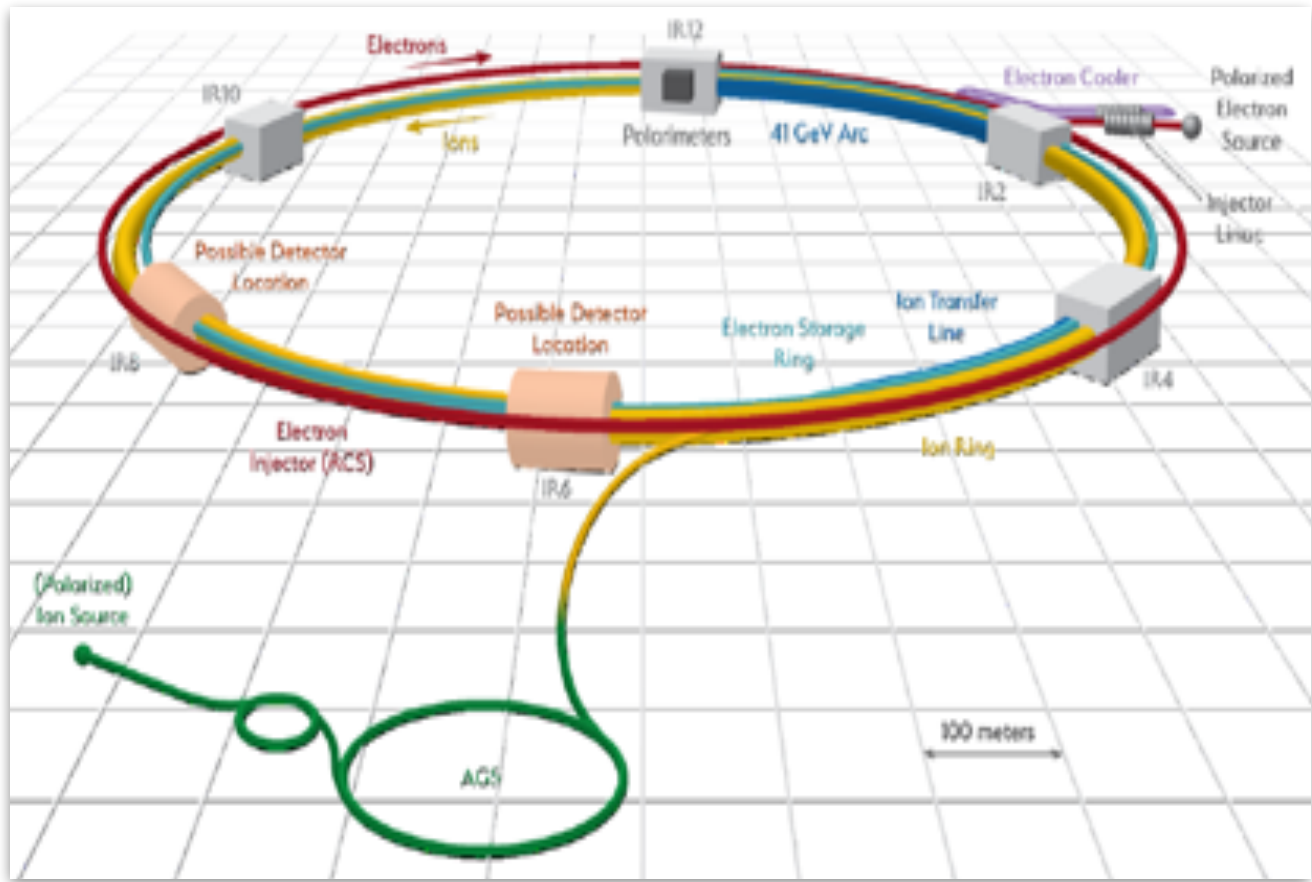
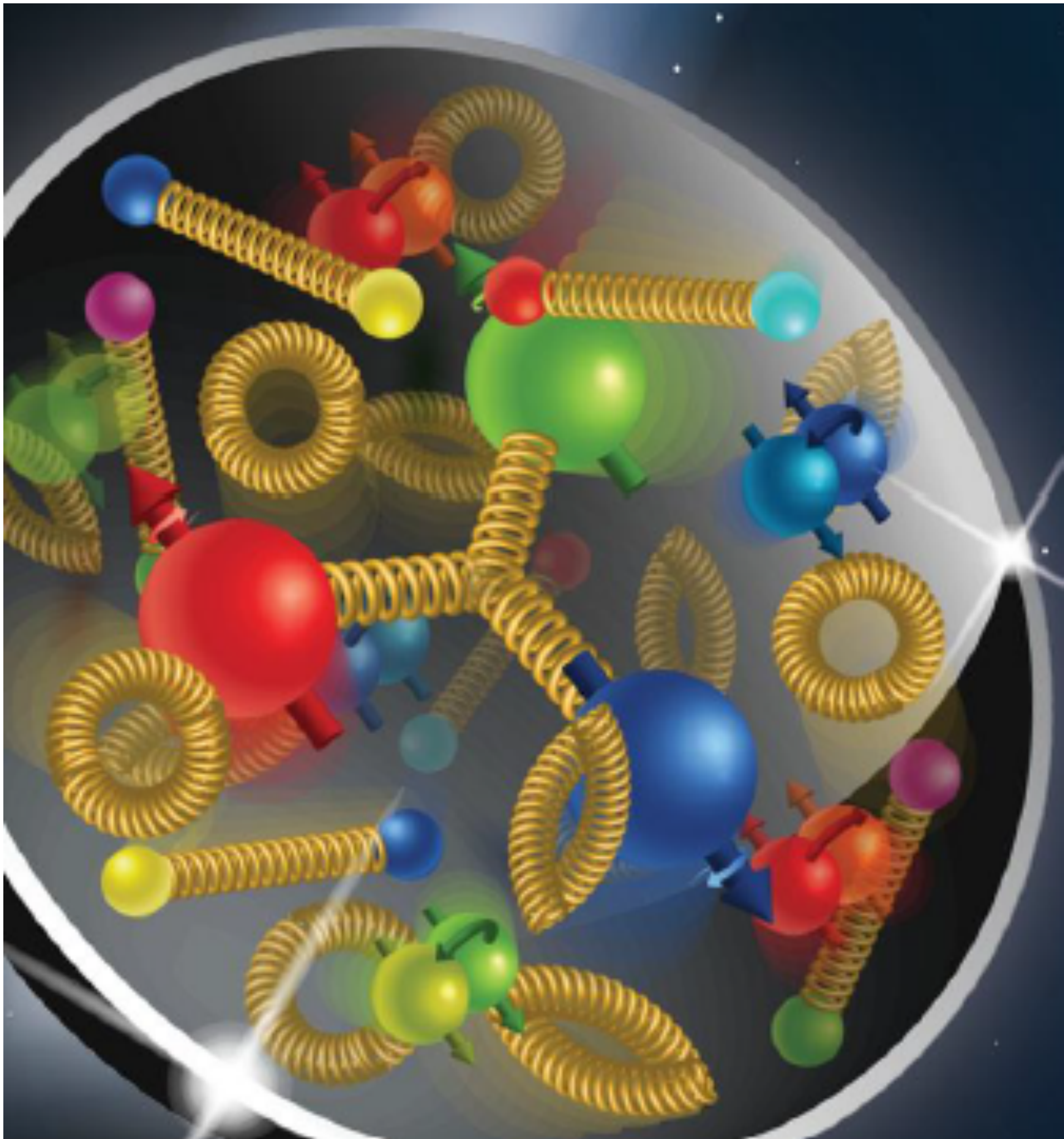
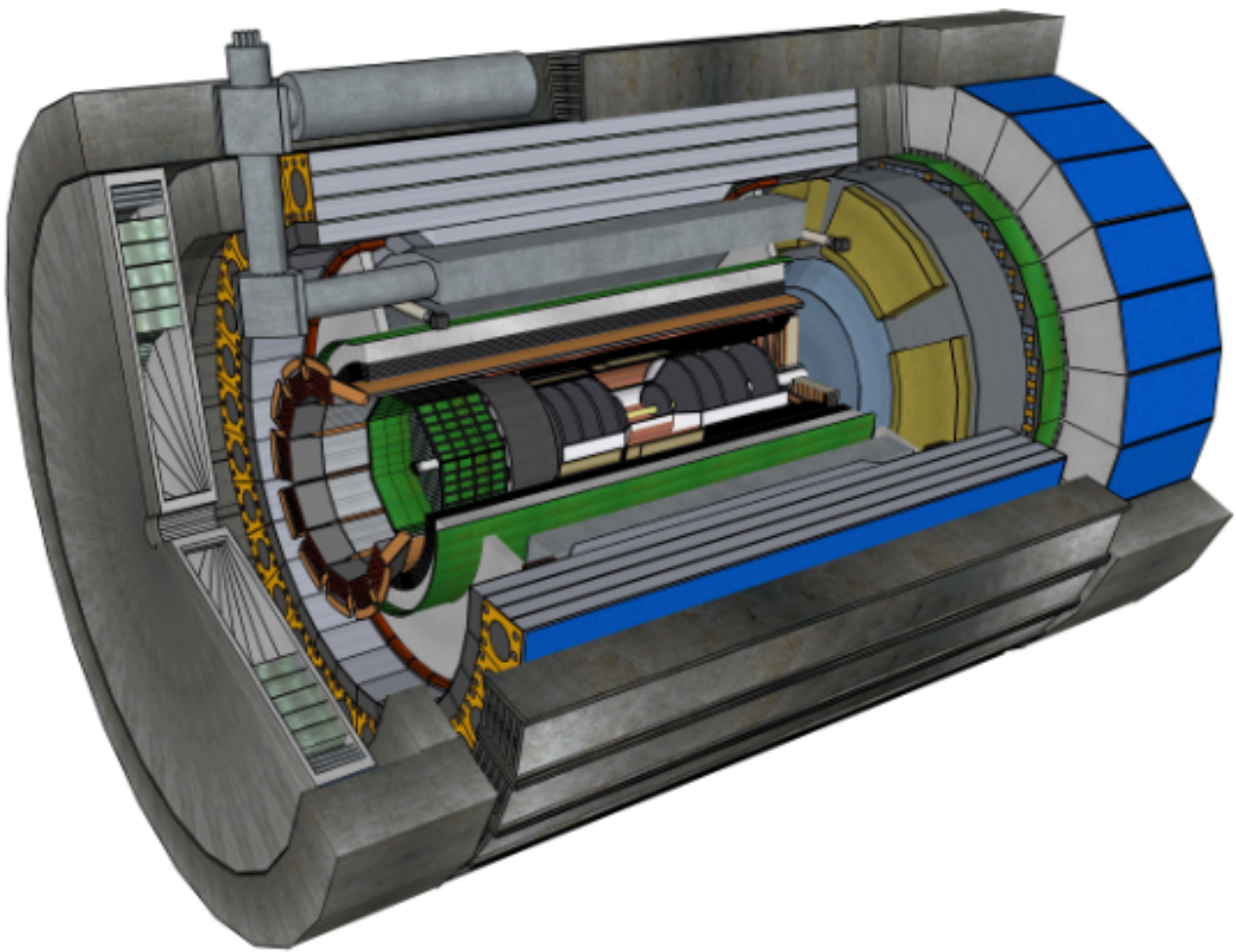




11–17 Jul 2026
Glasgow

July 2026 Joint ePIC/EICUG Meeting



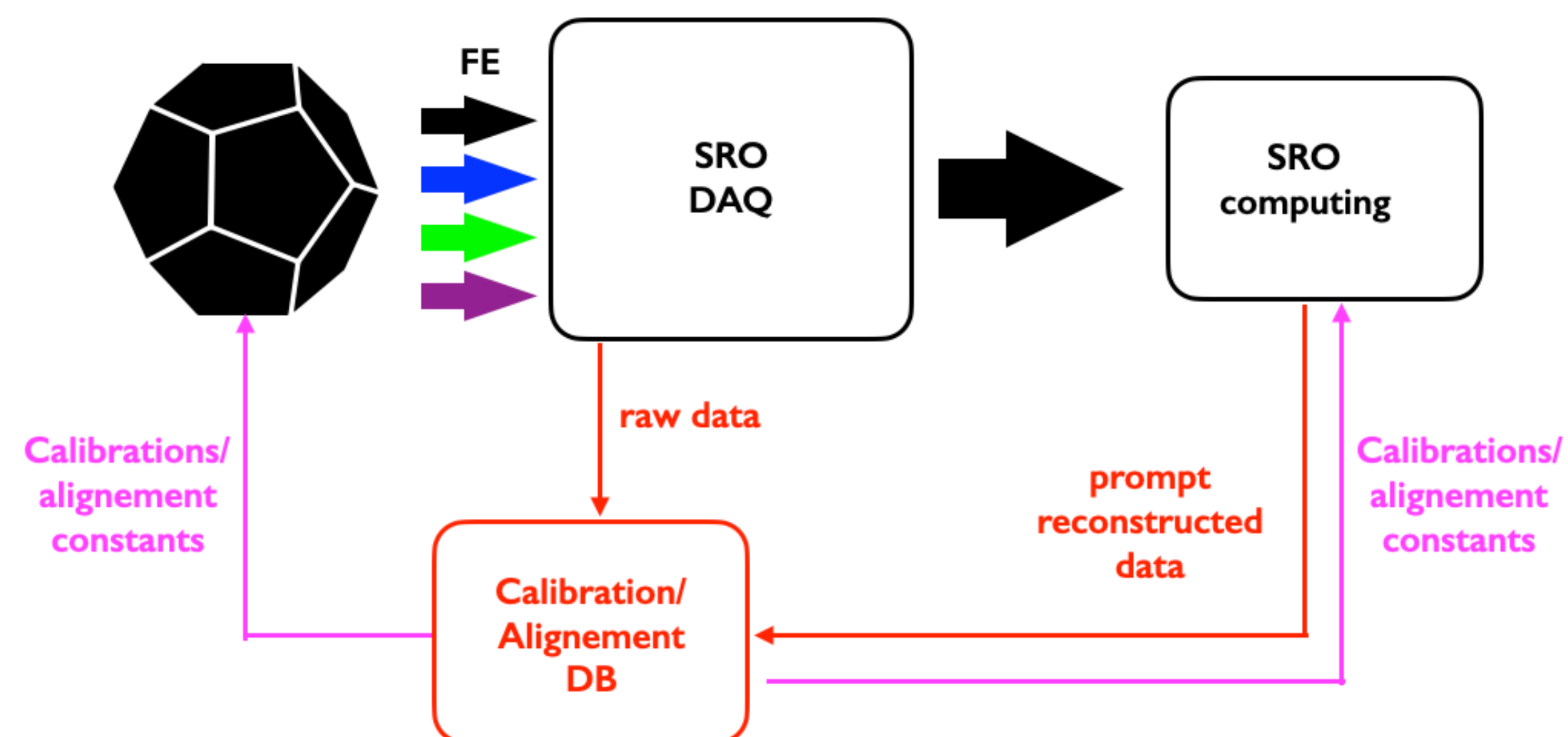
SRO Calibrations

M.Battaglieri (INFN), M.Diefenthaler (JLab), T.Gunji (TokyoU), J.Landgraf (BNL), T.Wenaus (BNL)



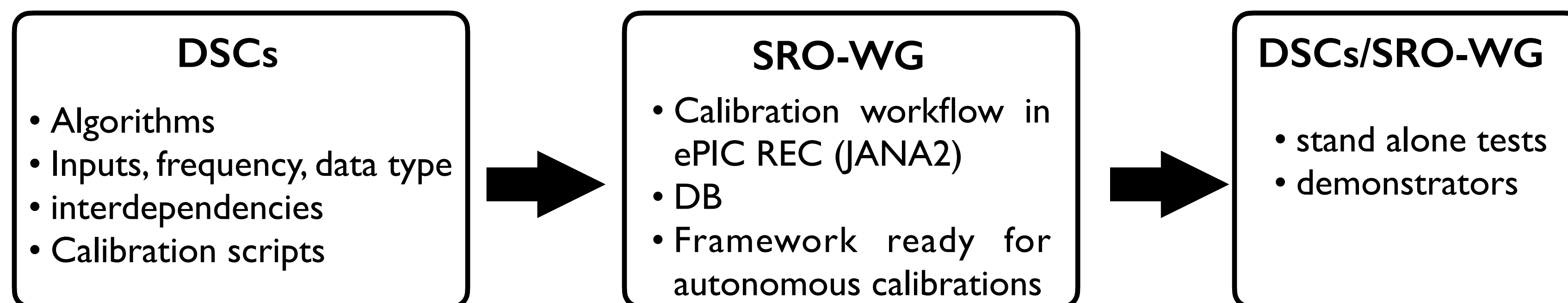
Alignment/Calibrations

- **ePICS SRO DAQ** aims for a rapid turnaround from data to full calibrated/reconstructed data
- **Data reconstruction time scale driven by calibrations (2-3 weeks max)**



- Specific to each sub-detector system
- Multiple iterations
- Different computing levels (Echelon's)
- Automatic/autonomous (AI?)
- FAST!!!!

Defining calibrations and alignment procedures is essential and urgent!



USE CASES

- **EECal**
- **SVT**

SRO calibration workflow

- **Phase I - Conceptual design**
- **Phase II - Requirements implementation**
- **Use cases (EEECal calorimeter, SVT)**

Workflow Conceptual Design

1. Classification of calibration tasks
 - Standalone (between fills, laser, pulser)
 - Physics-driven (tracks, vertex, PID dependent)
 - Iterative (requires previous constants or reco-calib loops)
2. Data and detector dependencies
 - Identify required inputs (tracks, PID, other calibrated detectors)
 - Build a dependency matrix / graph
 - Explicitly identify circular dependencies and iteration needs
3. Latency classes
 - Seconds (prompt feedback)
 - Minutes (run-by-run updates)
 - Hours (delayed / quasi-online)

Requirements implementations

1. Interface specifications (E0–E1 / E1–E2)
 - What data is produced and consumed?
 - Calibration object format, metadata, versioning, validity intervals
2. Infrastructure requirements
 - Conditions DB
 - Orchestration layer
 - Dedicated compute queues?
 - Monitoring and control interfaces
3. Workflow placement
 - At which stage of the DAQ does each calibration run?
 - Synchronous vs asynchronous execution?
4. Resource profiles
 - CPU intensity
 - Acceleration using GPU and AI
 - Data fraction needed
5. Autonomous calibration
 - Framework

Use cases for SRO calibrations

Goal: develop an end-to-end SRO pipeline with interchangeable components updated according to the PICO/MICRO/MINI/FULL DAQ development

EEECaI

Prototyping

Carlos (Muñoz Camacho) presented on Oct. 28 on the **Backward ECal (EEEMCaI) Calibration**. The EEEMCaI is a good example to start with. <https://indico.bnl.gov/event/30349/>

This prototype addresses reconstruction-level calibrations and physics-based calibration using high-statistics events.

- Script Integration:** Carlos provides calibration scripts and integrates them into JANA2/EICrecon, defining data flow and required inputs.
- Workflow Implementation:** Implement file-based workflow first; then prepare for stream-based workflow
- AI-Driven Components:** Stepwise integration of calibration detection logic, automated validation, and selective human-in-the-loop checkpoints.
- Workflow Orchestration:** Proven workflows are then incorporated into the overall orchestration framework for automated operations
- Milestones & Deliverables:** Prototype workflow (manual → semi-automated → AI-assisted), validated Conditions DB, documentation of APIs, state machine, ownership, and operational cycle; plan for scaling to full EIC detectors.

Other systems are welcome to join the prototype

- Start with EEEMCaI simulations with tweaked parameters
- Deployment of calibration algorithms to be tested initially on pseudo-data
- Possible bench tests with the EEECaI prototype (64ch) (JLab? DESY? LNF?)
- Use of other calorimeters (~1000ch), cosmic ray and/or test beam runs to validate the calibration procedure (as well as the SRO pipeline)

SVT

- Status of alignment software readiness and Simulations with misaligned geometries to test the alignment algorithms.
- Deployment of real-time alignment procedures to be tested initially o
- Integration with tracking reconstruction, exploring how the alignment constants can be updated and applied dynamically within the SRO pipeline.
- Validation plans using cosmic ray data, test beam data, or existing prototype setups to test both the alignment quality and the SRO pipeline performance.

- Timelines, milestones and deadlines for 2026/27
- Tracking progress
- Development of a mini-setup test bench

Continue with Taku's slides ...