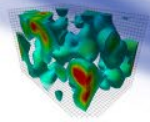


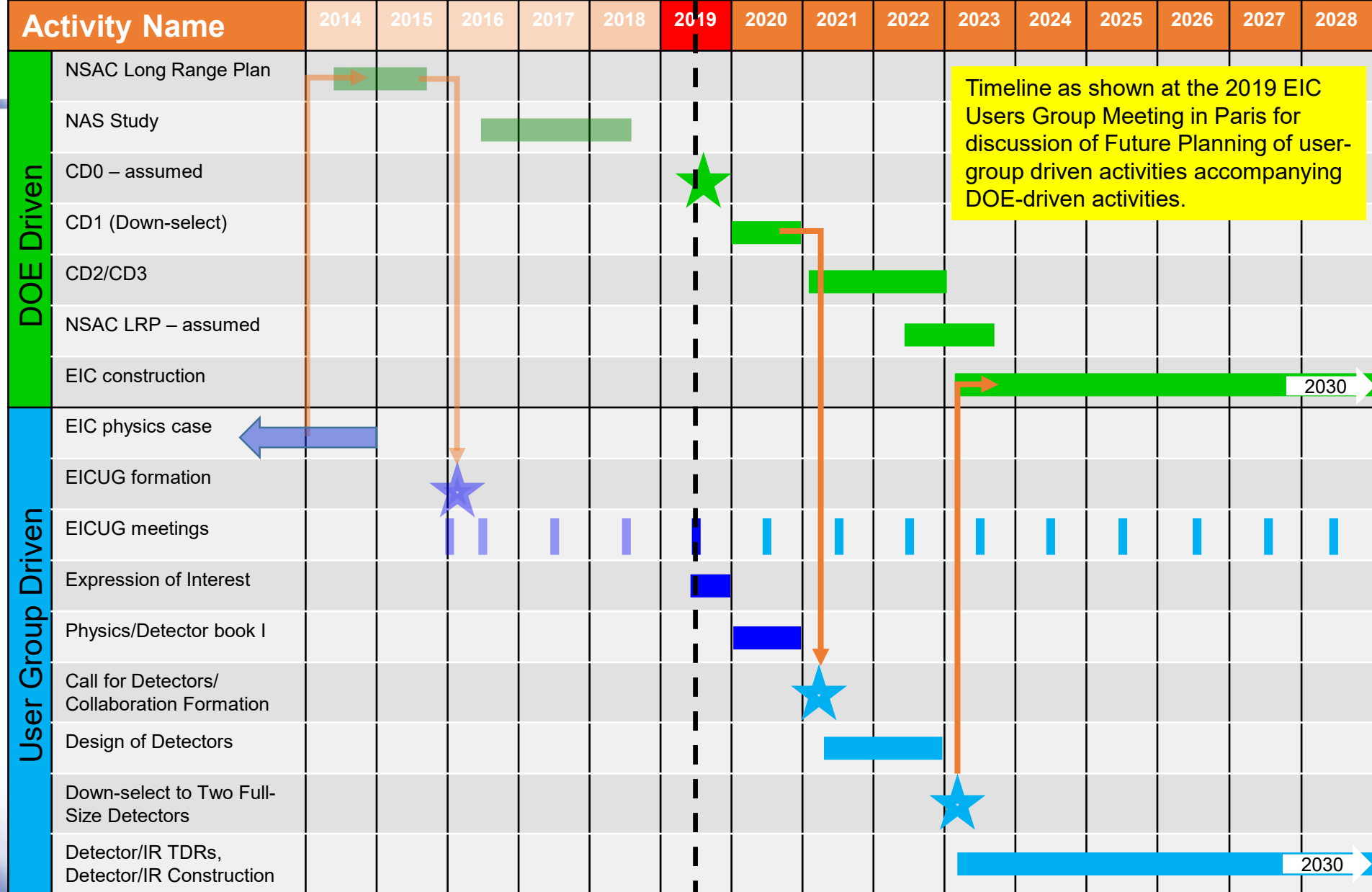
Steering Committee Plans for the Yellow Reports

EIC Physics and Detector Concepts: The Path to a Yellow Report

Rolf Ent and Thomas Ullrich on behalf of the EIC User Group Steering Committee

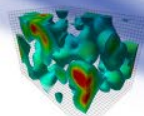
Note: the EIC User Group Steering Committee is working on a follow-up with more concrete logistics outline on conveners, dates/locations of various activities towards the Yellow Report(s), and agenda for the kick-off meeting. Your input of today will be folded in also for this planning.





Timeline as shown at the 2019 EIC Users Group Meeting in Paris for discussion of Future Planning of user-group driven activities accompanying DOE-driven activities.

CD0 = DOE “Mission Need” statement; **CD1** = design choice and site selection
CD2/CD3 = establish project baseline cost and schedule



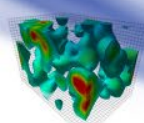
What is a Yellow Report?

The CERN Yellow Reports series provides a medium for communicating CERN-related work where publication in a journal is not appropriate. Reports include material having a large impact on the future of CERN, as well as reports on new activities which do not yet have a natural platform. The series includes reports on detectors and technical papers, criteria being that the audience should be large and the duration of interest long. The term Yellow Reports is now used frequently for documents with similar purpose in various physics communities unrelated to CERN.

Our purpose:

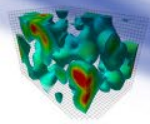
Advance the state of documented (i) physics studies (White Paper, INT program proceedings) and (ii) detector concepts (Detector and R&D Handbook) in preparation for the EIC. This will provide both the basis for further development of concepts for experimental equipment best suited to the EIC science needs, including complementarity of the **two detectors/interaction regions**, and input towards **future Technical Design Reports (TDRs)** of the experimental equipment.

Note: obviously, DOE-driven activities and timelines are out of our hands and can be subject to change, but either way we should document towards a TDR for the experimental equipment, to provide input for any DOE-driven timelines.



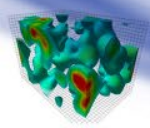
Strategy

- Quantify **physics measurements** for existing or new physics topics and implications for detector design (“**Physics/Detector Group**”)
 - Go beyond physics motivation to implication for detector requirements
 - Physics considerations for two independent complementary detectors
- Study **detector concepts** based on the requirements defined above, and quantify implications for the physics measurements (“**Detector/Physics Group**”)
 - Balance detector concepts versus impact on physics measurements.
 - Document complementarity (+ reduction of systematics) of detectors.
 - Fold in ancillary detectors, measurements (polarimetry, luminosity, ...)
 - Engage EIC-detector R&D consortia
- **Optional:** Study opportunities for **accelerator physics experiments** at a future EIC
 - Accelerator scope is to deliver EIC for nuclear/particle physics
 - EIC will also be unique facility that can push frontiers of accelerator S&T
 - Likely smaller scale, 5-10 accelerator scientists



Approach

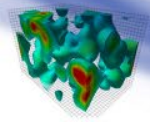
- Form physics/detector, detector/physics and accelerator physics working groups
- First two will likely have 3-4 conveners (= editors of final Reports), accelerator group likely will simply have Ferdi Willeke and Andrei Seryi as convener.
- Each group has 1 Steering Committee (SC) observer that follows progress and reports the status of the effort to the SC.
- The two physics/detector and detector/physics groups should have regular meetings (preferably weekly) via video conference/phone. At regular intervals (preferably monthly) both groups should have a joint meeting.
- Each group (physics and detector) will need to be divided in sub-groups, with sub-conveners. If we have an optional third accelerator group they likely can stay as one.
- Sub-groups will be defined following the analysis of the “Request of Information”.
- The sub-conveners will be the people being requested to guide and document the contributions (10-15 pages each) to the conveners for the Yellow Report(s).



Proposed Physics/Detector Sub-Groups

- First order we plan to follow the EICUG *Request of Information* call:
 - Longitudinal (spin) nucleon structure
 - 3D nucleon / nucleus structure
 - High density parton physics
 - Beyond Standard Model / Electro-weak physics
 - Hadronization and fragmentation
 - Nuclear Structure / Short-range correlations
 - Origin of nuclear force
 - Collective effects
 - Spectroscopy
 - Origin of mass
 - Other (Entanglement, Jet studies, ...)

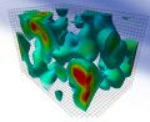
After analysis of the EICUG *Request of Information* gauging community interest the above scheme should be adjusted.



Proposed Detector/Physics Sub-Groups

- First order we plan to follow the EICUG *Request of Information* call:
 - Tracking
 - Vertexing
 - Calorimetry
 - Particle ID
 - Forward instrumentation / Backward instrumentation
 - IR design / Background studies
 - Ancillary Measurements: Polarimetry, Luminosity
 - Software / Computing
 - DAQ / Slow Controls / Readout
 - Other
- The three areas below have been added as they are important to study and document in the Yellow Reports:
 - Magnetic field options (configuration, strength, impact on machine, IR compatibility)
 - Arguments for 2 complementary detectors
 - Overall design/integration

After analysis of EICUG *Request of Information* the above scheme can be adjusted if needed.

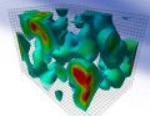


Timeline

2019	October	Information gathering stage
	Early November	Announce effort/plan and conveners
	Mid-December	Kick-off Meeting* (EICUG SC, Conveners, ...)
2020	Mid-March	First workshop*
	Late May/Early June	Second workshop*
	August	Status reports of main groups at EICUGM
	Mid-September	Third workshop*
	Mid-November	Fourth workshop* or Final Meeting (assembly of Yellow Report(s))
2021	January	(optional) Final Meeting

After assembly of Yellow Report(s), independent review team reads and comments, with final Yellow Report(s) to be released after folding in input. Goal is April 2021 (or, expedited January 2021).

** all workshops close to major airport, folding in different geographic regions*



EIC User Engagement

- The current accelerator and detector concepts are now in a state that with the simulation and software tools developed by the EICUG quantitative physics and detector studies can be done.
- EIC community engagement may, based on common interest, naturally evolve into proto-collaboration formation, independent of hosting site.
- It is vital for this effort that a large fraction of the active participants come from university groups. If it ends up with the labs carrying out the lion share of the work the effort will miss its goals.
 - We should aim to engage (at least!) 10% of the ~950 members of the EICUG in this effort.
 - We will integrate detector concepts with the ongoing EIC detector R&D program, to provide a strong synergy, but also encourage new groups to come in, **keeping in mind the goal of two complementary full detectors.**
 - This effort needs *substantial* participation from universities willing to invest some amount of their time in calendar year 2020 to this project. Yes, we are all busy, but the EIC time seems now!
 - **It is essential, EIC activities in DOE seem to proceed fast.**

