

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

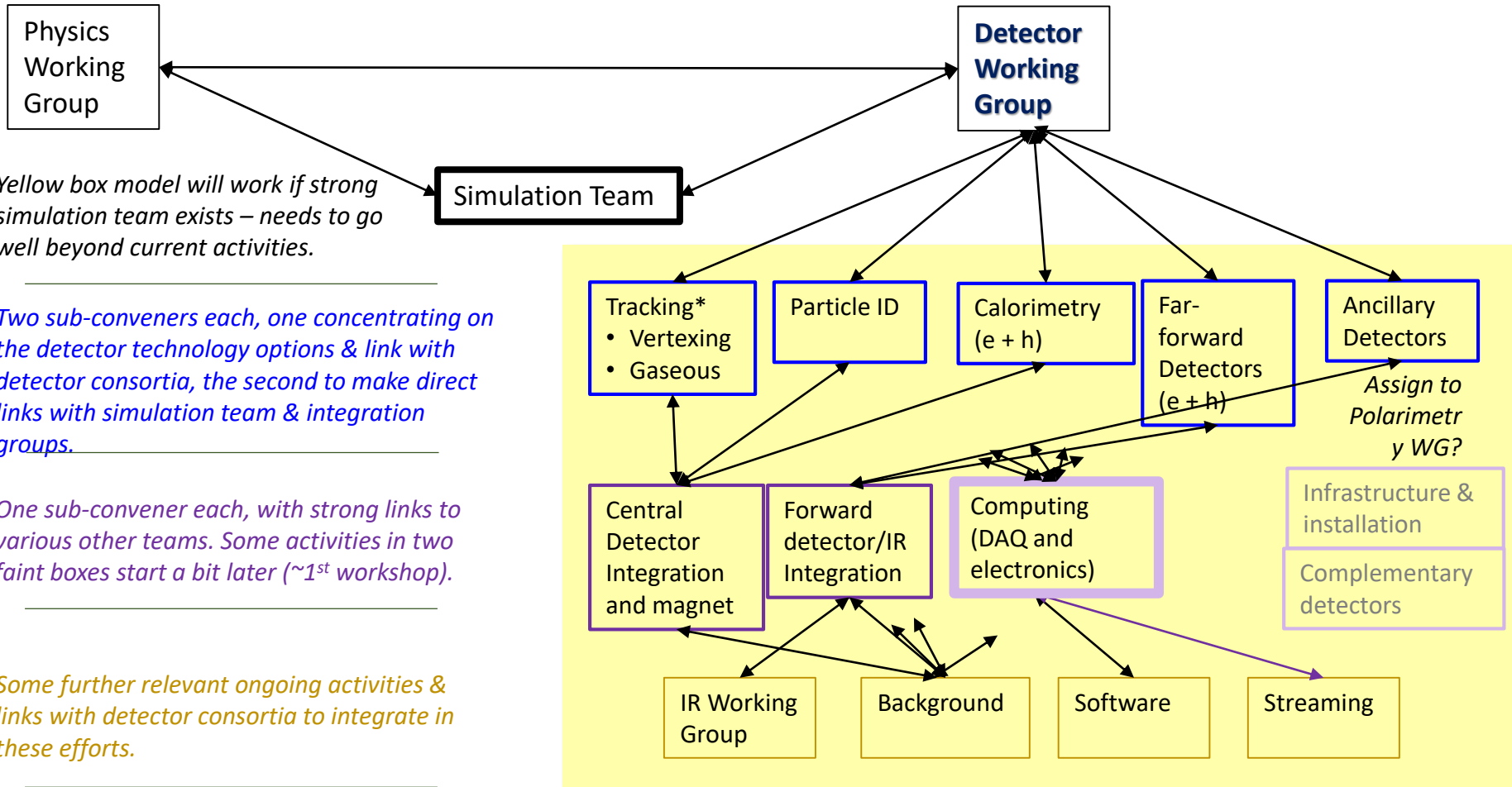
- Form physics/detector, detector/physics and accelerator physics working groups
- First two will likely have 3-4 conveners (= editors of final Reports), accelerator group likely will simply have Ferdi Willeke and Andrei Seryi as convener.
- Each group has 1 Steering Committee (SC) observer that follows 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).**

Timeline

2020	March 19-21	First workshop at Temple University, USA
	May 22-24	Second workshop at University of Pavia, Italy
	August 3-7	Status reports of main groups at EICUGM at FIU
	September 17-19 November 19-21	Third workshop at CUA, Washington DC, USA Fourth workshop at UC Berkeley, USA
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).

EIC Detector Working Group Organization Model



Yellow box model will work if strong simulation team exists – needs to go well beyond current activities.

Two sub-conveners each, one concentrating on the detector technology options & link with detector consortia, the second to make direct links with simulation team & integration groups.

One sub-convener each, with strong links to various other teams. Some activities in two faint boxes start a bit later (~1st workshop).

Some further relevant ongoing activities & links with detector consortia to integrate in these efforts.

**One additional sub-convener (to cover each of these distinct and evolving detector technologies)*

Detector WG Sub-conveners

System	Sub-convener names	Sub-convener task	Convener name
Tracking	<ol style="list-style-type: none"> 1. Kondo Gnanvo (UVA) 2. TBA 3. Annalisa Mastroserio (INFN) 	(vertex) detector technologies (gaseous) detector technologies simulation, integration coordination	Peter
Particle Identification	<ol style="list-style-type: none"> 1. Tom Hemmick (SBU) 2. Patrizia Rossi (JLab) 	detector technologies simulation, integration coordination	Silvia
Calorimetry (e + h)	<ol style="list-style-type: none"> 1. Eugene Chudakov (JLab) 2. Vladimir Berdnikov (CUA) 	detector technologies simulation, integration coordination	Ken
Far-forward detectors	<ol style="list-style-type: none"> 1. TBA 2. TBA 	detector technologies Simulation, integration coordination	Tanja
Ancillary detectors	Polarimetry WG	detector technologies	N/A
Central detector integration and magnet	<ol style="list-style-type: none"> 1. TBA 2. Alexander Kiselev (BNL) 	integration tasks, field strength need, pro and con	Peter, Silvia
Forward detector/IR integration	<ol style="list-style-type: none"> 1. Yulia Furletova (JLab) 	integration tasks	Tanja
DAQ and Electronics	<ol style="list-style-type: none"> 1. TBA 2. Andrea Celentano (INFN) 	list of activities/tasks needed	Silvia
Infrastructure and Installation	NA yet/conveners	NA yet	TBD
Detector Complementarity	Elke Aschenauer (BNL)	NA yet	Ken
Simulations (shared w. Physics WG)	Markus Diefenthaler (JLAB)	work w. both WGs central to progress	

Initial Tasks for Subconveners

- ❑ List of technologies using the EIC Detector Requirements and R&D Handbook as a starting point and also include items that go beyond that
- ❑ Preparatory work for simulation exercises on “data samples” to be ready to start simulations immediately after Temple workshop
- ❑ List what integration activities are required over the next 6-12 months, what questions remain to be answered, and to initiate integration tasks

Resources

☐ **EICUG webpage:** <http://www.eicug.org/web/content/yellow-report-initiative>

- Summary of the Yellow Report Initiative
- Definition of the YR audience
- Strategy and Approach
- Meetings, Calendar, and Mailing lists
- Material and References

☐ **Subgroup contributors**

- Initial list compiled by WG conveners based on input from SC, labs, university groups, and R&D Consortia
- Evolving list – needs to be updated by subconveners