

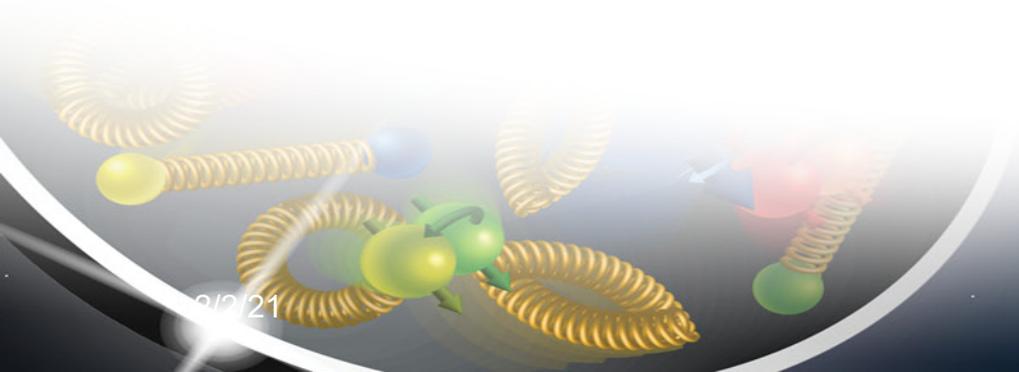
IR2@EIC - Initiative

Report @ CFNS

February 2, 2021

Latifa Elouadrhiri

Jefferson Lab



Workshop series on IR2@EIC Organization

Co-PI's: V. Burkert (JLab), L. Elouadrhiri (JLab)

OC: M. Contalbrigo (Ferrara), A. Deshpande (Stony Brook), H. Gao (Duke), B. Jacak (LBL), R. Milner (MIT), F. Sabatie (Saclay/CEA), T. Satogata (JLab), B. Surrow (Temple)



Volker Burkert



Marco Contalbrigo



Abhay Deshpande



Latifa Elouadrhiri



Haiyan Gao



Barbara Jacak



Richard Milner



Franck Sabatie

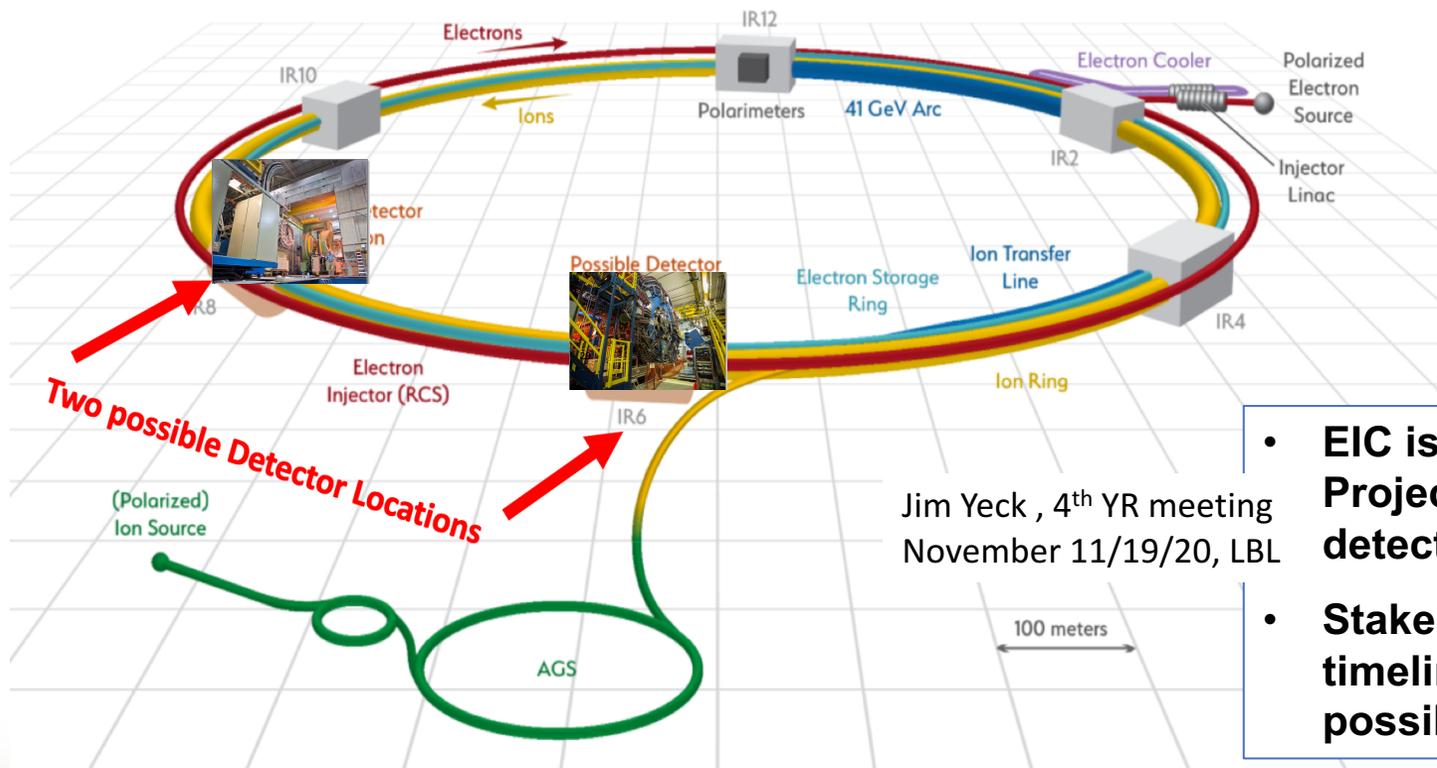


Todd Satogata

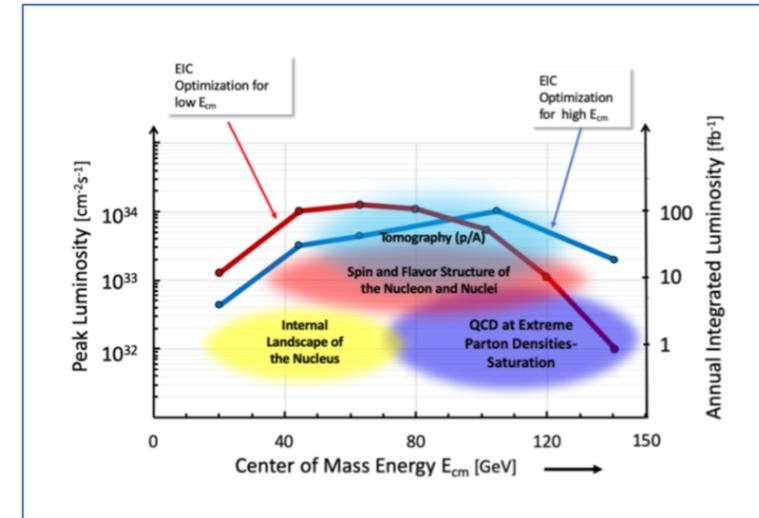


Bernd Surrow

EIC Electron & Ion Rings & Interaction Regions

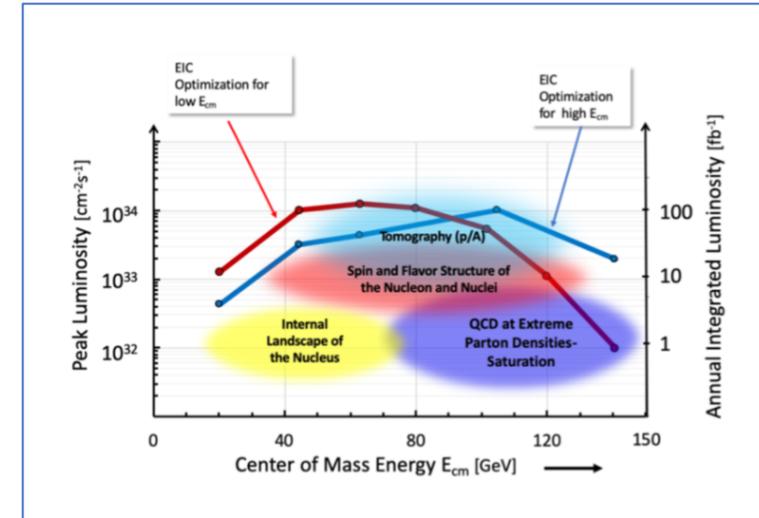
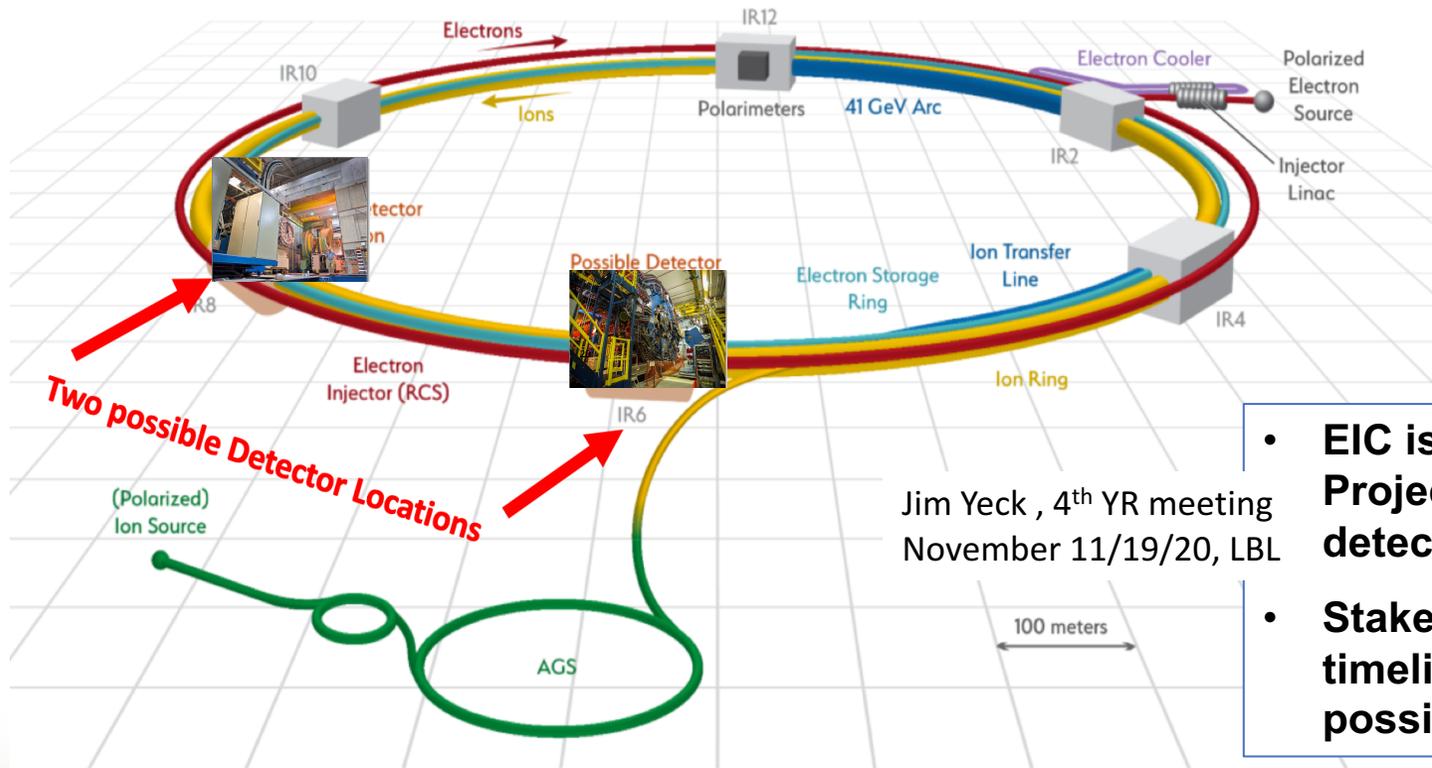


Jim Yeck, 4th YR meeting
November 11/19/20, LBL



- EIC is capable of supporting two IRs and detectors. Project funding currently for one IR and 2/3 of one detector.
- Stakeholders agree that 2nd IR with detector of similar timeline as EIC is desirable and routes to making this possible will be explored.

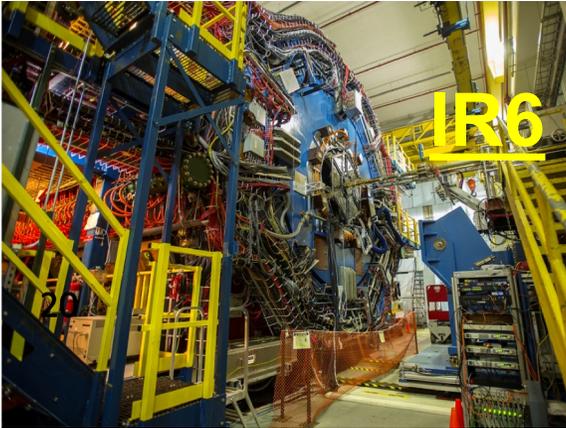
EIC Electron & Ion Rings & Interaction Regions



- EIC is capable of supporting two IRs and detectors. Project funding currently for one IR and 2/3 of one detector.
- Stakeholders agree that 2nd IR with detector of similar timeline as EIC is desirable and routes to making this possible will be explored.

This preparatory meeting was a step towards this goal and to further explore complementarity from the different performance of the two IRs

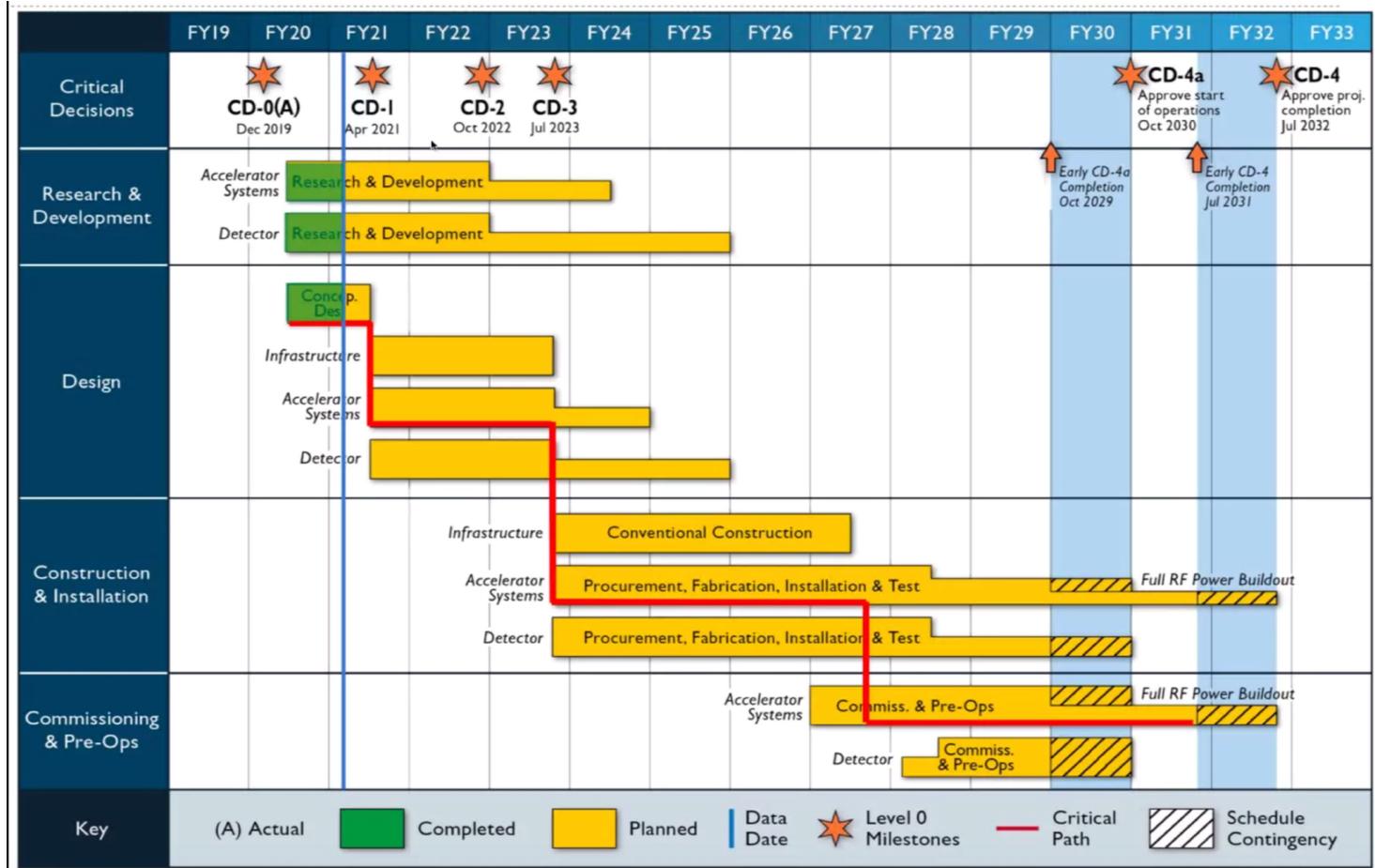
Two Interaction Regions - Schedule



IR6



IR8



Goals of the IR2@EIC Initiative

→ Optimize the science output and impact of the EIC:

- Primary interaction region optimized for high luminosity at CM energies > 80 GeV
- Optimize 2nd interaction region to emphasize high luminosity at CM energies < 80 GeV
- Other ways of optimization may be explored as well
- Work with EIC Project and the community to achieve this optimization

→ Scientific Output:

- Evaluate the evolving landscape of the EIC science
- Review complementary approaches for the overall optimization
- Drawing on the results of the Yellow Report initiative and of the EoI results
- Prepare White Paper with a detailed discussion of the conclusions reached

Preparatory Meeting Agenda

- Review of major science aspects
- IR2 design status and impact
- Yellow Report analysis impact on science and detectors
- Does IR2 initiate new software developments?
- IR1 status and Expression of Interest
- Discussions & short community contributions

Detailed Agenda: <https://indico.bnl.gov/event/9794/timetable/>

Chair: Richard Milner

09:50 - 10:00 *Welcome - Abhay Deshpande*

191 Registered Participants

10:00 - 10:10 *Introduction - Volker Burkert*

10:10 - 10:50 *Recent developments in nuclear science at EIC - George Sterman*

10:50 - 11:30 *Recent developments in exclusive nucleon science at EIC - Cédric Mezrag*

11:30 - 11:45 *Break*

Chair: Haiyan Gao

11:45 - 12:25 *Recent developments in SIDIS & Jets science at EIC - Feng Yuan*

12:25 - 12:55 *IR2@EIC design status - Vasilij Morozov*

12:55 - 13:55 *Break*

Chair: Todd Satogata

13:55 - 14:10 *Call for detector proposal - Maria Chamizo, Robert McKeown*

14:10 - 14:35 *Software developments towards a 2nd IR - Markus Diefenthaler*

14:35 - 14:55 *YR results and analysis I (Science) - Andreas Metz*

14:55 - 15:15 *YR results and analysis II (Detectors) - Kenneth Barish*

15:15 - 15:25 *Break*

Chair: Barbara Jacak

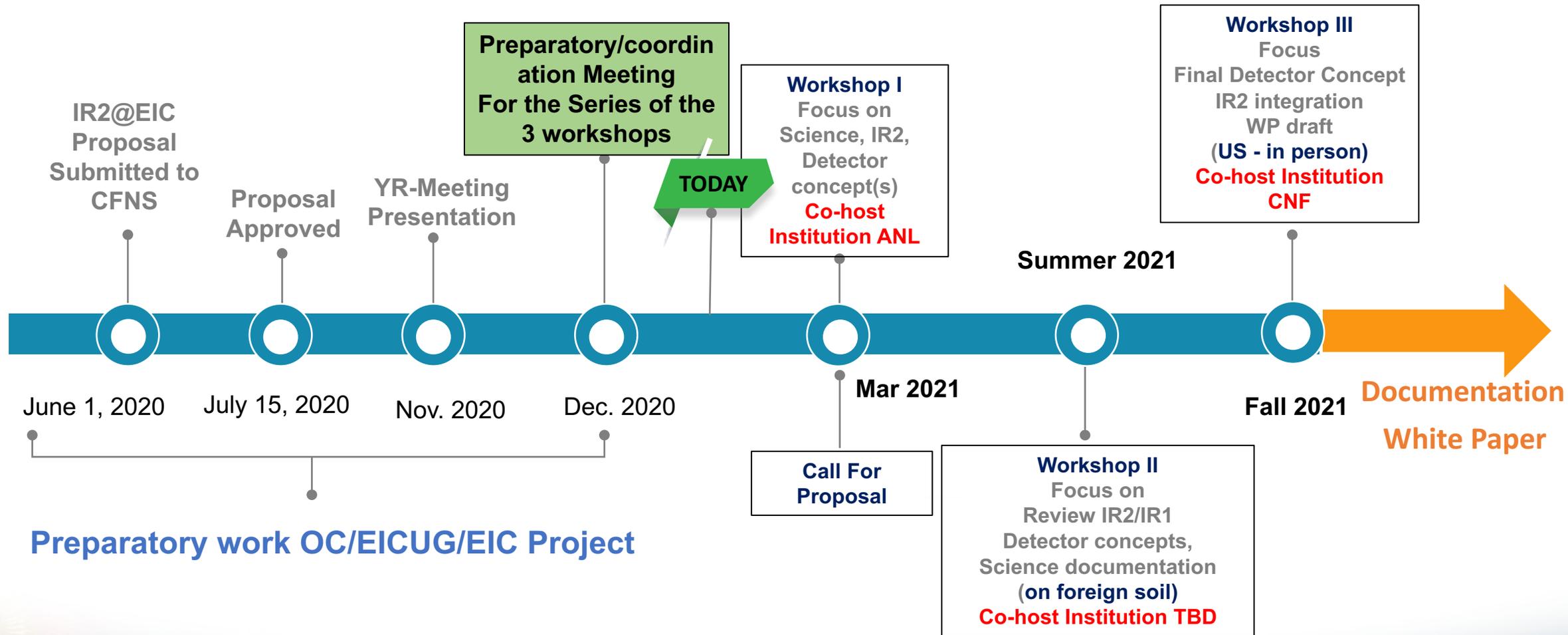
15:25 - 15:55 *IR1@EIC Detector concept/implementation & EoI - Elke Aschenauer*

15:55 - 17:00 *Short contributions & discussion session*

Meeting Community Contributions

1. **T. Horn:** A possible EIC Detector (ECCE)
2. **C. Hyde:** A Compact Detector for Electron-Ion-Collider Science
3. **K. Piotrkowski:** Precise luminosity measurement at the EIC vs. 5 ns bunch spacing
4. **Dien Nguyen:** Double tagging measurements from the $A = 3$ nuclei in Far Forward Region
5. **P. Toronski:** IR2: opportunities for exclusive coherent processes on light nuclei
6. **F. Hauenstein:** Quasi-elastic Short-Range-Correlations
7. **B. Schmookler:** Exotic Nuclei at the EIC
8. **Justin Stevens:** XYZ spectroscopy

IR2@EIC Series of Workshops - Timeline



Day-1

- | | | | |
|--------------|---|--------------|---|
| 9:00 | Welcome | | |
| 9:05 | Purpose of Workshop (IR2@EIC proposal) | 12:40 | Science case 3 (SiDIS & Jets) |
| 9:20 | IR2 in the context of the EIC Project | 13:10 | Science case 4 (Science of nuclei) |
| 10:00 | Call for Detector proposals | 13:40 | Brunch/Lunch/Dinner break |
| 10:20 | Complementarity of IR2 | 14:20 | Detector Concept 1 |
| 10:50 | Discussion | 14:50 | Detector Concept 2 |
| 11:20 | Break | 15:20 | Detector Concept 3 |
| 11:40 | Science case 1 (Exclusive processes) | 16:00 | Discussions |
| 12:10 | Science case 2 (heavy flavor physics) | 16:30 | End of Day 1 |

Day-2

- 10:00 IR2 - Luminosity vs CM energy**
- 10:30 IR2 - Electrons & protons polarization**
- 10:50 IR2 - Performance when operating together with IR1 at low and at high CM energies**
- 11:10 Break**
- 11:30 Working groups parallel session**
- WG1 – Exc. Processes, DVCS, DVMP, J/ψ , ..**
- WG2 - SIDIS, Jets, TMDs ...**
- WG3 - Heavy flavors, spectroscopy,..**
- WG4 - Light & heavy ions, far forward processes,..**
- WG5 - tbd**
- 13:30 Break**

Presentations on Detector Technologies

- 14:10 Solenoid Magnet**
- 14:30 Charged particle ID hadrons**
- 14:50 Electrons ID / pion rejection**
- 15:10 Calorimetry, electromagnetic**
- 15:30 Calorimetry, hadronic**
- 15:50 Vertexing**
- 16:10 Central Tracking**
- 16:30 End of Day 2**

Day-3

Working group Reports

- 10:00** WG1 (exclusive processes)
- 10:30** WG2 SIDIS, Jets
- 11:00** WG3 Heavy flavor processes, spectroscopy
- 11:30** Break
- 11:45** WG4 Light & Heavy ions, far forward processes
- 12:15** WG5 tbd
- 12:45** Discussions
- 13:15** End of workshop

IR2@EIC - Path Forward

- The preparatory meeting with the material presented will help structure the series of workshops in 2021 with respect to scope and focus towards IR2@EIC science and conceptual design of its instrumentation.
- Planning for year 2021 and white paper has started
- The community engagement is essential to the success. The series of workshops is also intended to attract new interests and collaborators to the EIC project.

