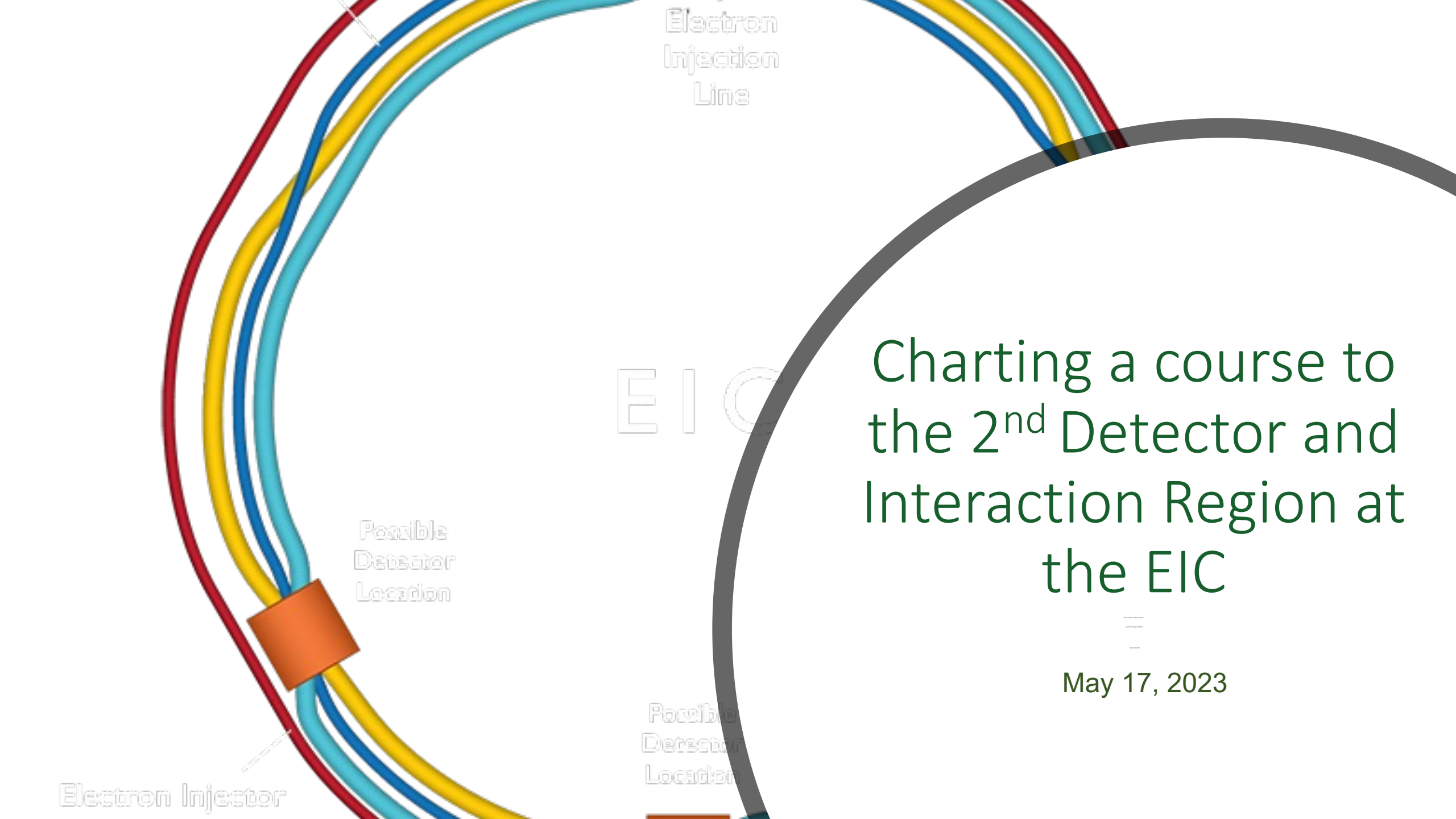


Charting a course to the 2nd Detector and Interaction Region at the EIC

May 17, 2023

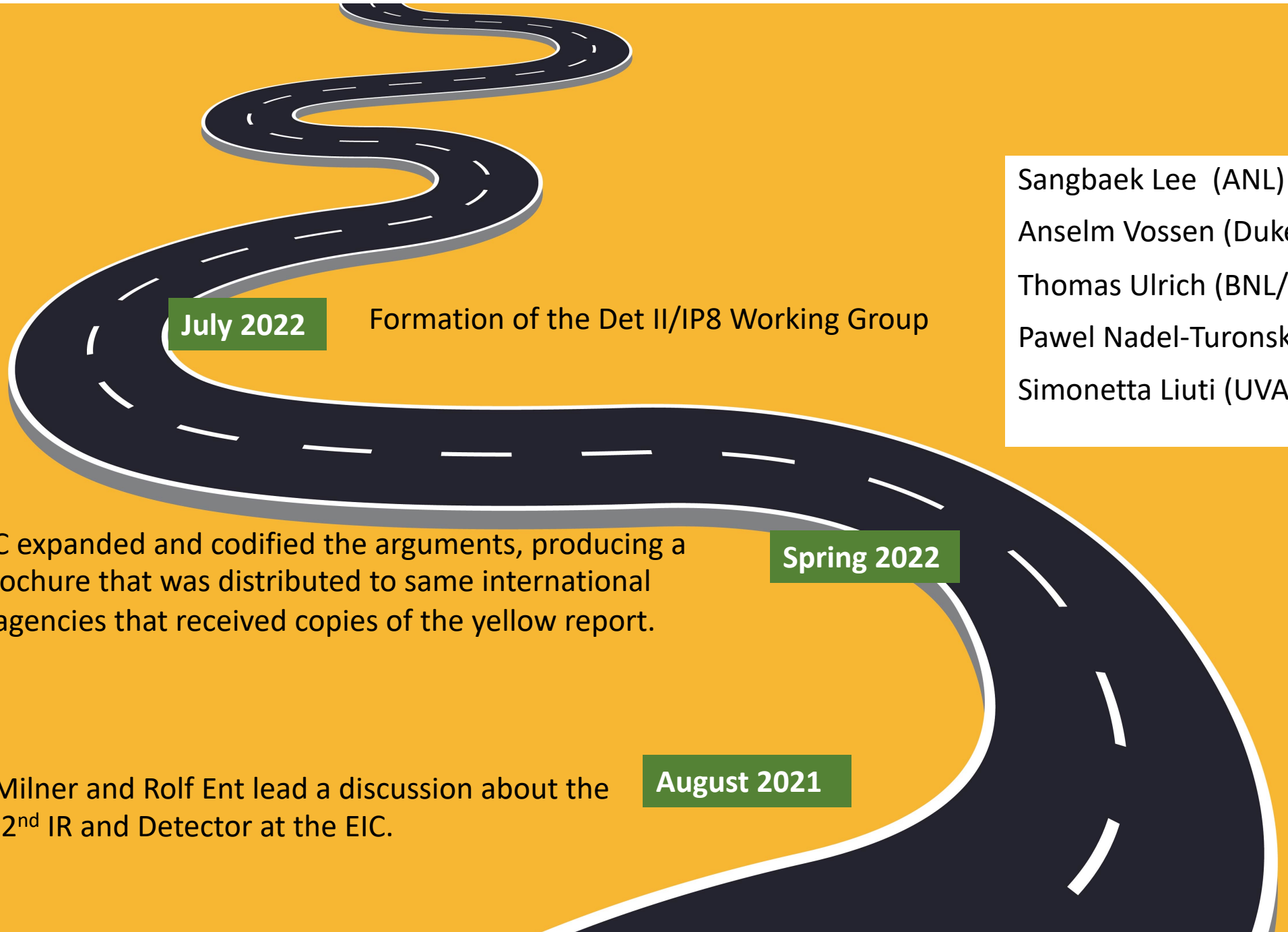
EICUG Det II Milestones

EICUG-SC expanded and codified the arguments, producing a glossy brochure that was distributed to same international funding agencies that received copies of the yellow report.

Spring 2022

Richard Milner and Rolf Ent lead a discussion about the role of a 2nd IR and Detector at the EIC.

August 2021



July 2022

Formation of the Det II/IP8 Working Group

Sangbaek Lee (ANL)

Anselm Vossen (Duke/JLAB)

Thomas Ulrich (BNL/Yale)

Pawel Nadel-Turonski (CFNS/SBU)

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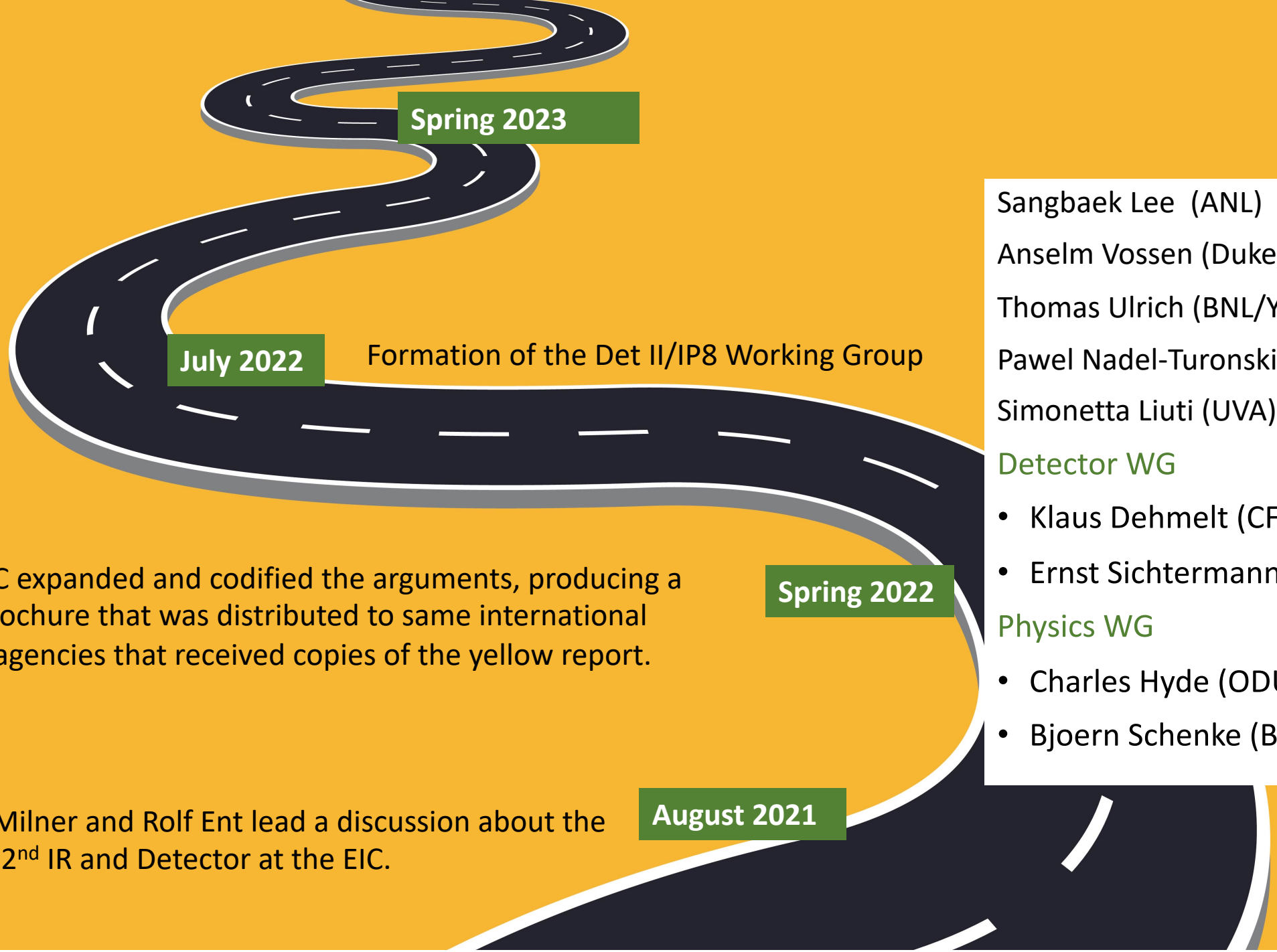

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Detector WG

- Klaus Dehmelt (CFNS/SBU)
- Ernst Sichtermann (LBNL)

Physics WG

- Charles Hyde (ODU)
- Bjoern Schenke (BNL)

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Det II/IP8 Incubator Workshop

December 2022

CNFS Workshop

1. Cross checks of key measurements & potential discoveries
2. New opportunities enabled by unique features of a 2nd detector such as the 2nd focus in IR8.

July 2022

Formation of the Det II/IP8 Working Group

Spring 2022

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Unique opportunities for Det II @ IP8

A. **MAGNETIC FIELD -** Solenoid field up to 3T, allowing for high resolution momentum reconstruction for charged particles.

B. **EXTENDED COVERAGE** for precision electromagnetic calorimetry **-** important for DVCS on nuclei

C. **MUONS** – enhanced muon ID in backward and barrel region.

D. **BACKWARD HADRONIC CALO -** Low-x physics, reconstruction of current jets in the approach to saturation

E. **SECONDARY FOCUS -** tagging for nearly all ion fragments and extended acceptance for low pT/ low x protons. Enables detection of short-lived rare isotopes.

May 2023

1st International Workshop on Detector II

Det II/IP8 Incubator Workshop

December 2022

July 2022

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August 2021

Where to from here?

I. Develop concrete physics projections for selected channels

- Leverage ePIC software & simulation structure
- Start with magnetic field
- Study effect of field + tracking choices on tracks in backward region
- Explore complementarity with ePIC technologies – mRICH, SciGlass etc.

II. Recruit new institutions

- Identify international ambassadors (physics contacts – not funding agencies) that can help navigate the nuclear physics landscape in their country.
- Goal is to engage institutions that are interested in EIC, but on an extended timeline, after the day 1 commissioning of ePIC.
- Maintain close communication with project so as to avoid mixed or confusing messages to potential international partner.

1st International Workshop on Detector II

- Thank you for joining us this week!
- Your job is two-fold:

Bring new ideas to the table

Highlight measurements that should be high priority for a 2nd detector.

- This is another opportunity to help shape the future physics scope at the EIC.

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- Your job is two-fold:

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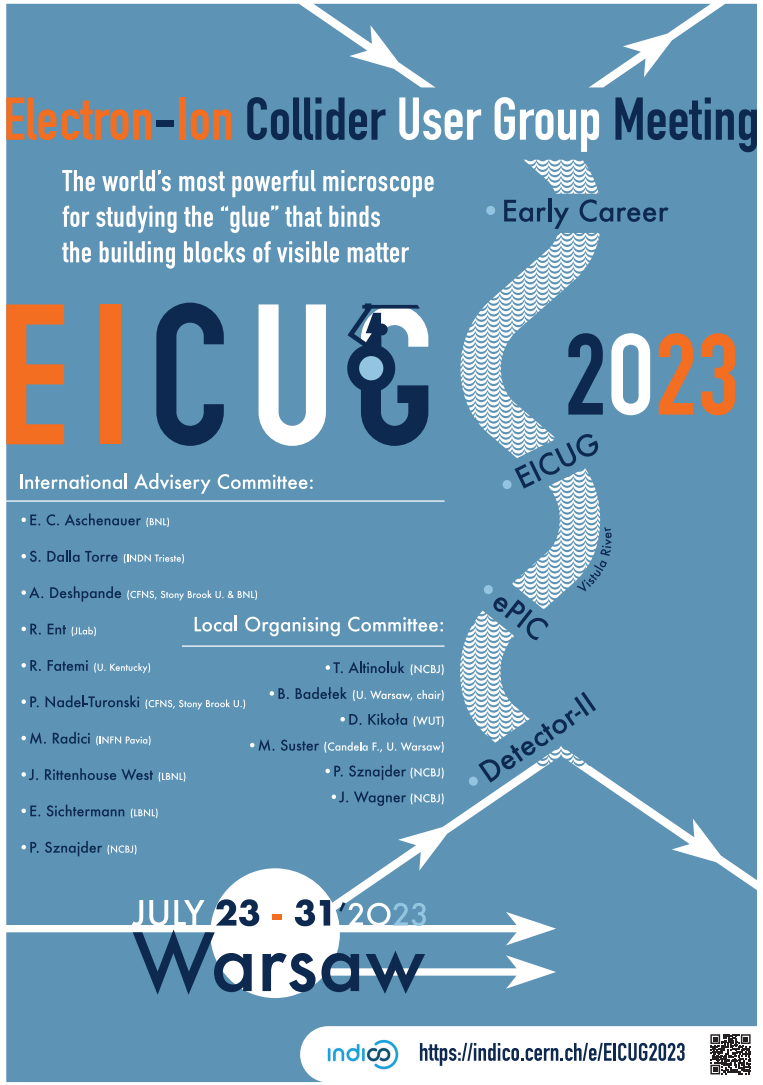
Highlight measurements that should be high priority for a 2nd detector.

- This is another opportunity to help shape the future physics scope at the EIC.
- Next Det II workshop is July 30-31 in Warsaw!



Backup

Charge for Detector II/IP8 Working Group

1. Engage the broader community, ***including theorists, accelerator physicists and ePIC experimentalists***, to fully develop projections for the portfolio of measurements that are complementary to the ePIC physics program, including those that capitalize on the implementation of the secondary focus.

2. Work with the EICUG Steering Committee and Project to ***recruit new institutions*** and establish a diverse and vibrant 2nd Detector working group.

3. Utilize the extended design period for Detector 2 to identify groups that will focus on ***R&D for emerging technologies*** that could provide another aspect of complementarity to ePIC.

4. Facilitate the development of a ***unified concept*** for a general-purpose detector at IR8. In particular, the 2nd detector should be complementary to the project detector at IR6 and may capitalize on the possibility of a secondary focus at IR8.