

# **Analysis Ecosystem Workshop II**

## **Report of Contributions**

Contribution ID: 1

Type: **not specified**

## Welcome

*Monday 23 May 2022 09:00 (15 minutes)*

**Presenters:** JOUVIN, Michel (Université Paris-Saclay (FR)); CHAMBERT, Valerie (Universite de Paris-Sud 11 (FR)); CHAMBERT, Valérie (IPN Orsay/IN2P3/CNRS)

**Session Classification:** Plenary

Contribution ID: 2

Type: **not specified**

## **Introduction to the Workshop**

*Monday 23 May 2022 09:15 (30 minutes)*

**Presenter:** Dr STEWART, Graeme A (CERN)

**Session Classification:** Plenary

Contribution ID: 3

Type: **not specified**

## **New Advances in Analysis Facilities**

*Monday 23 May 2022 09:45 (15 minutes)*

**Presenter:** GARDNER, Robert (University of Chicago)

**Session Classification:** Plenary

Contribution ID: 4

Type: **not specified**

## **Analysis frameworks and Analysis Facilities: user experience**

*Monday 23 May 2022 10:00 (15 minutes)*

**Presenter:** SMITH, Nick (Fermi National Accelerator Lab. (US))

**Session Classification:** Plenary

Contribution ID: 5

Type: **not specified**

## **Impact on Analysis Facilities in the context of DOMA evolution**

*Monday 23 May 2022 10:15 (15 minutes)*

**Presenter:** FORTI, Alessandra (University of Manchester (GB))

**Session Classification:** Plenary

Contribution ID: 6

Type: **not specified**

## Data Analysis Metadata Review

*Monday 23 May 2022 11:00 (20 minutes)*

**Presenter:** KUHR, Thomas (Ludwig Maximilians Universitat (DE))

**Session Classification:** Plenary

Contribution ID: 7

Type: **not specified**

## **Big Questions in Systematics Processing**

*Monday 23 May 2022 11:20 (20 minutes)*

**Presenter:** HAGEBOECK, Stephan (CERN)

**Session Classification:** Plenary



Contribution ID: 8

Type: **not specified**

## **ML Tooling and Use Landscape in HEP**

*Monday 23 May 2022 11:40 (20 minutes)*

**Presenter:** GASIOROWSKI, Sean Joseph (SLAC National Accelerator Laboratory (US))

**Session Classification:** Plenary

Contribution ID: 9

Type: **not specified**

## **Differentiable Programming in HEP**

*Monday 23 May 2022 12:00 (20 minutes)*

**Presenter:** HEINRICH, Lukas Alexander (CERN)

**Session Classification:** Plenary

Contribution ID: **10**

Type: **not specified**

## **Extra Discussion**

*Monday 23 May 2022 12:20 (10 minutes)*

**Session Classification:** Plenary

Contribution ID: 11

Type: **not specified**

## ROOT User Workshop Summary

*Monday 23 May 2022 17:00 (20 minutes)*

**Presenter:** NAUMANN, Axel (CERN)

**Session Classification:** Plenary

Contribution ID: 12

Type: **not specified**

## **Analysis user experience with the Python HEP ecosystem**

*Monday 23 May 2022 17:20 (20 minutes)*

**Primary authors:** PIVARSKI, Jim (Princeton University); FEICKERT, Matthew (Univ. Illinois at Urbana Champaign (US))

**Presenters:** PIVARSKI, Jim (Princeton University); FEICKERT, Matthew (Univ. Illinois at Urbana Champaign (US))

**Session Classification:** Plenary

Contribution ID: 13

Type: **not specified**

## Declarative Languages Overview

*Monday 23 May 2022 17:40 (20 minutes)*

**Presenter:** SEKMEN, Sezen (Kyungpook National University (KR))

**Session Classification:** Plenary

Contribution ID: 14

Type: **not specified**

## Reduced Formats in CMS

*Tuesday 24 May 2022 09:20 (15 minutes)*

**Presenter:** GRAY, Lindsey (Fermi National Accelerator Lab. (US))

**Session Classification:** Plenary

Contribution ID: 15

Type: **not specified**

## Reduced Formats in Belle II

*Tuesday 24 May 2022 09:40 (15 minutes)*

**Presenter:** HERNANDEZ VILLANUEVA, Michel (DESY)

**Session Classification:** Plenary



Contribution ID: 16

Type: **not specified**

## Reduced Formats in ATLAS

*Tuesday 24 May 2022 09:00 (15 minutes)*

**Presenter:** CATMORE, James (University of Oslo (NO))

**Session Classification:** Plenary

Contribution ID: 17

Type: **not specified**

## Real-Time and Trigger Analysis Overview

*Tuesday 24 May 2022 10:00 (20 minutes)*

**Presenters:** DOGLIONI, Caterina (University of Manchester (GB)); SOKOLOFF, Michael David (University of Cincinnati (US))

**Session Classification:** Plenary

Contribution ID: **18**

Type: **not specified**

## **Real-Time and Trigger Analysis Topics**

**Session Classification:** Plenary

Contribution ID: 19

Type: **not specified**

## Reduced formats for long lived particles in ATLAS

*Tuesday 24 May 2022 10:50 (15 minutes)*

**Presenter:** BURZYNSKI, Jackson Carl (Simon Fraser University (CA))

**Session Classification:** Reduced Formats

Contribution ID: **20**

Type: **not specified**

## **AFs in CERN**

*Monday 23 May 2022 14:00 (7 minutes)*

**Presenter:** TEJEDOR SAAVEDRA, Enric (CERN)

**Session Classification:** Analysis Facilities

Contribution ID: 21

Type: **not specified**

## AFs in CMS

*Monday 23 May 2022 14:10 (7 minutes)*

**Presenter:** GRAY, Lindsey (Fermi National Accelerator Lab. (US))

**Session Classification:** Analysis Facilities

Contribution ID: 22

Type: **not specified**

## AFs in ATLAS

*Monday 23 May 2022 14:20 (7 minutes)*

**Presenters:** FORTI, Alessandra (University of Manchester (GB)); HEINRICH, Lukas Alexander (CERN)

**Session Classification:** Analysis Facilities

Contribution ID: 23

Type: **not specified**

## AFs in LHCb

*Monday 23 May 2022 14:30 (7 minutes)*

**Presenter:** Dr SKIDMORE, Nicole (University of Manchester)

**Session Classification:** Analysis Facilities



Contribution ID: 24

Type: **not specified**

## **Discussion "Bridging analysis frameworks stakeholders and resource providers for future analysis HL-LHC facilities"**

*Monday 23 May 2022 14:40 (1h 20m)*

- Integrating different types of resources/"aaS" available on demand: public and private clouds, and Kubernetes (k8s): what is the best "recipe" for AF?
- "How to marry interactivity with distributed computation?" aspects related to e.g. UI design, resource management policies and debugging tools.
- Analysis containerization, feedback from point of view of users, AF architects, resource providers
- Idea of "dream" Analysis Facility, metrics and evaluation of successful AF characteristics

**Presenters:** SKIDMORE, Nicole (University of Manchester); SHADURA, Oksana (University of Nebraska Lincoln (US))

**Session Classification:** Analysis Facilities

Contribution ID: 25

Type: **not specified**

## **Augmenting PHYSLITE content for sub set of events in ATLAS**

*Tuesday 24 May 2022 11:50 (15 minutes)*

**Presenter:** HEINRICH, Lukas Alexander (CERN)

**Session Classification:** Reduced Formats

Contribution ID: 26

Type: **not specified**

## **Metadata paper: Discussion of next steps**

*Monday 23 May 2022 14:00 (1 hour)*

**Presenter:** LAYCOCK, Paul James (Brookhaven National Laboratory (US))

**Session Classification:** Metadata and Systematics

Contribution ID: 27

Type: **not specified**

## **What analysers want: Infrastructure for systematic variations**

*Monday 23 May 2022 15:00 (20 minutes)*

**Presenter:** GUIRAUD, Enrico (EP-SFT, CERN)

**Session Classification:** Metadata and Systematics

Contribution ID: 28

Type: **not specified**

## **Systematics discussion**

*Monday 23 May 2022 15:20 (40 minutes)*

**Session Classification:** Metadata and Systematics

Contribution ID: 29

Type: **not specified**

## Documentation, examples, benchmarking, interoperability

*Tuesday 24 May 2022 10:50 (55 minutes)*

4 aspects of documentation: <https://documentation.divio.com/>

interoperability examples:

- histograms: Josh's ROOT workshop talk <https://indico.fnal.gov/event/23628/contributions/237985/>
- RDataFrame / awkward: Ianna's ROOT workshop talk <https://indico.fnal.gov/event/23628/contributions/240305/>
- statistical models: RooFit, zfit, pyhf, ...

**Session Classification:** Analysis User Experience and Declarative Languages

Contribution ID: **30**

Type: **not specified**

## **Additional topics & follow-up from previous day**

*Tuesday 24 May 2022 11:45 (55 minutes)*

lessons to be learned from Julia,  
future of ADL,  
...

**Session Classification:** Analysis User Experience and Declarative Languages

Contribution ID: **31**

Type: **not specified**

## **Limitations of NanoAOD and possible solutions**

*Tuesday 24 May 2022 11:20 (15 minutes)*

**Presenter:** CARDWELL, Bryan (University of Virginia (US))

**Session Classification:** Reduced Formats



Contribution ID: **32**

Type: **not specified**

## **Object Store R&D**

*Tuesday 24 May 2022 12:20 (15 minutes)*

**Presenter:** SMITH, Nick (Fermi National Accelerator Lab. (US))

**Session Classification:** Reduced Formats

Contribution ID: **33**

Type: **not specified**

## **Pickup badges and lunch tickets**

*Monday 23 May 2022 08:45 (15 minutes)*

Contribution ID: **34**

Type: **not specified**

## **Analysis Facilities**

*Wednesday 25 May 2022 11:00 (10 minutes)*

**Presenters:** SKIDMORE, Nicole (University of Manchester); SHADURA, Oksana (University of Nebraska Lincoln (US))

**Session Classification:** Plenary

Contribution ID: 35

Type: **not specified**

## **ML tools and differentiable computing workflows**

*Wednesday 25 May 2022 11:10 (10 minutes)*

**Presenters:** HEINRICH, Lukas Alexander (CERN); SIMPSON, Nathan Daniel (Lund University (SE))

**Session Classification:** Plenary

Contribution ID: **36**

Type: **not specified**

## **“Real-time” online/trigger-level analysis**

*Wednesday 25 May 2022 11:20 (10 minutes)*

**Presenters:** EULISSE, Giulio (CERN); SOKOLOFF, Michael David (University of Cincinnati (US))

**Session Classification:** Plenary

Contribution ID: 37

Type: **not specified**

## **Analysis User Experience and Declarative Languages**

*Wednesday 25 May 2022 11:30 (10 minutes)*

**Presenters:** HELD, Alexander (New York University (US)); REMBSER, Jonas (CERN)

**Session Classification:** Plenary

Contribution ID: **38**

Type: **not specified**

## **Analysis on reduced formats or specialist inputs**

*Wednesday 25 May 2022 11:40 (10 minutes)*

**Presenters:** REINSVOLD HALL, Allison (Fermilab); SCHAARSCHMIDT, Jana (University of Washington (US)); GOUSKOS, Loukas (CERN)

**Session Classification:** Plenary

Contribution ID: 39

Type: **not specified**

## **Bookkeeping and systematics handling**

*Wednesday 25 May 2022 11:50 (10 minutes)*

**Presenters:** LAYCOCK, Paul James (Brookhaven National Laboratory (US)); KHOO, Teng Jian (Humboldt University of Berlin (DE))

**Session Classification:** Plenary



Contribution ID: 40

Type: **not specified**

## Discussion

*Wednesday 25 May 2022 12:10 (15 minutes)*

**Session Classification:** Plenary

Contribution ID: 41

Type: **not specified**

## Closing Words

*Wednesday 25 May 2022 12:25 (5 minutes)*

**Presenter:** WATTS, Gordon (University of Washington (US))

**Session Classification:** Plenary

Contribution ID: 42

Type: **not specified**

## Discussion

**Session Classification:** Plenary

Contribution ID: 43

Type: **not specified**

## Discussion

**Session Classification:** Plenary

Contribution ID: 44

Type: **not specified**

## Discussion

**Session Classification:** Plenary

Contribution ID: 45

Type: **not specified**

## Intro

*Monday 23 May 2022 14:00 (10 minutes)*

**Presenters:** HEINRICH, Lukas Alexander (CERN); SIMPSON, Nathan Daniel (Lund University (SE))

**Session Classification:** ML and Autodiff Workflows

Contribution ID: 46

Type: **not specified**

## **Generative Model Training & ML Infrastructure**

*Monday 23 May 2022 14:10 (20 minutes)*

**Presenter:** EREN, Engin

**Session Classification:** ML and Autodiff Workflows

Contribution ID: 47

Type: **not specified**

## Differentiable Design Optimization

*Monday 23 May 2022 14:30 (20 minutes)*

**Presenter:** STRONG, Giles Chatham (Universita e INFN, Padova (IT))

**Session Classification:** ML and Autodiff Workflows



Contribution ID: 48

Type: **not specified**

## **AD beyond Python and ML**

*Monday 23 May 2022 15:30 (30 minutes)*

**Presenter:** VASILEV, Vassil (Princeton University (US))

**Session Classification:** ML and Autodiff Workflows

Contribution ID: 49

Type: **not specified**

## Discussion

*Monday 23 May 2022 14:50 (40 minutes)*

**Presenters:** HEINRICH, Lukas Alexander (CERN); SIMPSON, Nathan Daniel (Lund University (SE))

**Session Classification:** ML and Autodiff Workflows

Contribution ID: **50**

Type: **not specified**

## Group Photo

*Tuesday 24 May 2022 10:20 (5 minutes)*

Contribution ID: 51

Type: **not specified**

## News of the Day

*Tuesday 24 May 2022 08:58 (2 minutes)*

Contribution ID: 52

Type: **not specified**

## **Discussion: Let's Define the Steps of an Analysis Workflow**

*Tuesday 24 May 2022 16:30 (1h 30m)*

**Presenter:** GALEWSKY, Benjamin (Univ. Illinois at Urbana Champaign (US))

**Session Classification:** BoFs and Breakouts

Contribution ID: 53

Type: **not specified**

## **LHCb HLT1 Monitoring**

*Tuesday 24 May 2022 16:30 (20 minutes)*

**Presenter:** CRAIK, Daniel Charles (Massachusetts Inst. of Technology (US))

**Session Classification:** Real-Time and Trigger Analysis

Contribution ID: 54

Type: **not specified**

## Discussion

*Tuesday 24 May 2022 16:50 (1h 10m)*

**Session Classification:** Real-Time and Trigger Analysis

Contribution ID: 55

Type: **not specified**

## News of the Day and Discussion Planning

*Wednesday 25 May 2022 09:00 (10 minutes)*

**Presenter:** Dr STEWART, Graeme A (CERN)

**Session Classification:** Continuing Discussions



Contribution ID: 56

Type: **not specified**

## Further Topic Discussion Time

*Wednesday 25 May 2022 09:10 (1h 20m)*

**Session Classification:** Continuing Discussions

Contribution ID: 57

Type: **not specified**

## Let's Define an Analysis Workflow

*Wednesday 25 May 2022 12:00 (10 minutes)*

**Presenter:** GALEWSKY, Benjamin (Univ. Illinois at Urbana Champaign (US))

**Session Classification:** Plenary