CERN-EP R&D Initiative Software Working Group

Jakob Blomer and Graeme Stewart

EP R&D Programme

- R&D programme on new Detector Technologies
  - Spans a 5-years period from 2020 onwards (with a possible extension by another 5 years)
  - Detector hardware, electronics and **software** for new experiments and detector upgrades beyond LHC phase II
- Working groups are for the key themes
  - To study the state of the art, limitations and main challenges
  - Define an **ambitious** and **focused** work programme with milestones, deliverables and resource estimates.
- Open Process
  - Interested colleagues - no matter if engineer or physicist, staff or user, at CERN or elsewhere - are invited to contribute to the definition of the R&D programme

Timeline

- 20 November 2017 - Kick off meeting
  https://indico.cern.ch/event/677108/

  Working groups form and start to develop first ideas

- 16 March 2018 - First Workshop
  https://indico.cern.ch/event/696066/

  WG meetings and preparation of their chapter

- October 2018 - Second Workshop
- November 2018 - Deliver final report

R&D on EXPERIMENTAL TECHNOLOGIES

CERN's Experimental Physics department has launched a process to define its R&D programme on new Experimental Technologies. The R&D work would span a 5-year period from 2020 onwards (with a possible extension by another 5 years), and cover detector hardware, electronics and software for new experiments and detector upgrades beyond LHC Phase II.

8 working group sessions
Special R&D proposals

- Silicon detectors
- Gas detectors
- Calorimetry and light based detectors
- Detector Mechanics
- IC technologies
- High Speed Links
- Software
- Detector Magnets

1st Workshop
16 March 2018 (full day)
CERN, main auditorium

Please register!
http://indico.cern.ch/e/EP-RD-Workshop1

Experimental Physics Department
R&D on Experimental Technologies

Software Working Group

- Convenors: *Jakob Blomer* and *Graeme Stewart*
- Organised a kick-off meeting for Software WG Monday 5th February, https://indico.cern.ch/event/699252/
- Have a first open meeting inviting lightning talks on topics
  - 5-10 minutes, 3-4 slides
  - Let your thoughts wander - propose some daring avenues of exploration!
- Already contacted key people in experiments, in other CERN groups and through the HSF
- E-group: EP-RDET-WG7-Software@cern.ch

Questions - Inspiration!

- Physics motivation for a particular technology to be developed?
- New technologies might we be obliged to use in the future?
- A concrete piece of software that to be expected within 2 years?
- An educated guess about the potential of the technology in the next 5-10 years?
- Can we carry out the R&D work roughly within the current resource envelope?

HSF Community Roadmap

OpenLab white paper on future challenges

Software technology forum

- HEP algorithm toolbox for computing accelerators
- Machine learning for analysis, fast simulation, I/O tuning; error estimation and predictable system behavior
- Turn-key systems for future experiments; framework modularization and ready-made analysis facilities
- High-level programming paradigms and abstractions; declarative programming, software correctness guarantees, domain-specific languages, etc.