HSF Update

Graeme Stewart, for HSF Coordination

WLCG Overview Board, 2018-11-30

New Working Groups (post CWP Roadmap)

- CWP Roadmap laid out a course for R&D in the next decade
  - Big success in raising awareness of software as a critical area to invest in for our future success
  - Fruits of this effort being seen in, e.g. IRIS-HEP project that has substantial funding from the NSF
  - We hope funding success will continue, but...
- Need to setup structures in which collaborative R&D can happen
  - Experiments have large effort pools and new funding will not replace that
  - We have to show we can use our current resources effectively with a collaborative focus
- HSF decided to setup new working groups, concentrating on the software areas where resource consumption is critical
  - Detector Simulation
  - Reconstruction and Software Triggers
  - Data Analysis

New Working Groups Appointments

- Process to do so was new ground for the HSF
  - Had to establish a <u>proper mandate</u>
  - Call to the community for nominations
    - Of course we reached out to key individuals, e.g. experiment computing coordination
    - 16 candidates for 9 convenorships
  - Setup a search committee (of 5) to be able to take comments from the community
    - Considerable feedback received that helped identify the best slate of convenors
  - This process did take quite some time, however it was positively received and helps to establish the legitimacy of these groups as having real support in the community
- Appointments are for 2019 (1 year), but renewable

New Convenors

- [Detector Simulation](#)
    - Heather Gray, ATLAS, US
    - Witold Pokorski, Geant4, CERN
    - Gloria Corti, LHCb, CERN
- [Reconstruction and Software Triggers](#)
    - David Lange, CMS, US
    - Caterina Doglioni, ATLAS, Sweden
    - Agniezska Dziurda, LHCb, Poland
- [Data Analysis](#)
    - Andrea Rizzi, CMS, Italy
    - Danilo Piparo, ROOT, CERN
    - Paul Laycock, Belle II, US
- Working groups will now get started, planning first activities in the New Year and a session at the joint [HSF/WLCG/OSG workshop](#) in JLab

Physics Event Generators Workshop

- Arising from the CWP we recognised the need to engage more with the theory community that write the Monte Carlo event generators
  - Challenges of higher order generators needed for HL-LHC precision physics
  - Technical improvements to generator code and how to support that activity
  - Optimising use of generators by experiments
- Organised by HSF and LPCC
  - For generator authors, experiments and software engineers
- 56 participants for a 2 day workshop (Indico)
  - Had a handful of people stay on for a hackathon session
- Good feedback - theory community commented they really never gathered together to tackle these issues before
  - "I learned a lot" - Pythia author

Outcomes

- Need to decide on the best problems to focus on…
  - Understand differences between different experiments' CPU 'spend' on generators
  - Comparison of different generators' performance
    - Run times and negative event weight rates
    - Differences in using NLO calculations vs. LO multi-leg
  - Rewarding people who work on technical improvements
    - Not valued as part of a theory career
    - Experience of using software engineers in the past was mixed
      - Does not mean we should not try again - but don't be naive about human investment needed
  - Improvements to common infrastructures libraries (LHAPDF, HepMC, LHE) - allows scaling onto HPCs
  - GPU ports could be very interesting - Madgraph has one, was not seized on in the past
  - Share results when it is appropriate and useful, like unweighted matrix elements
- Setting up a small group of convenors to carry on activities - 3 people identified so far