Computational Frontier

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Indiana University

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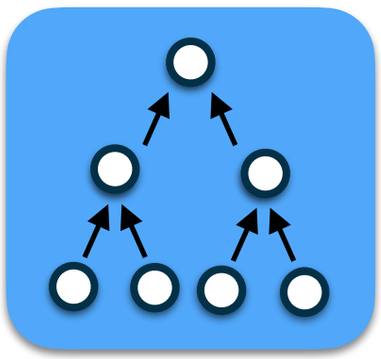
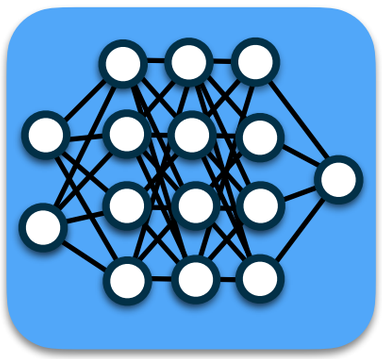
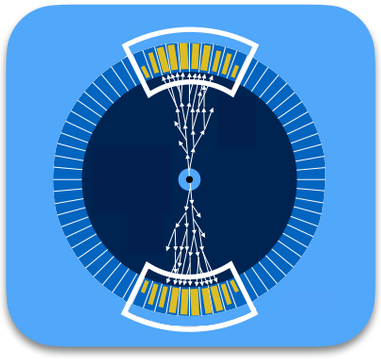
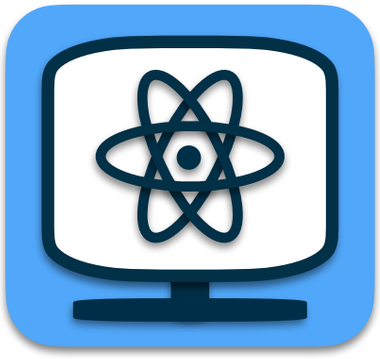
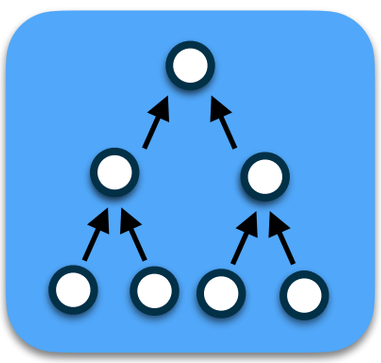








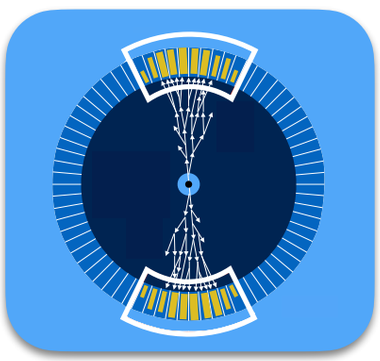
Computational Frontier Organization



CompF01

Experimental Algorithm Parallelization

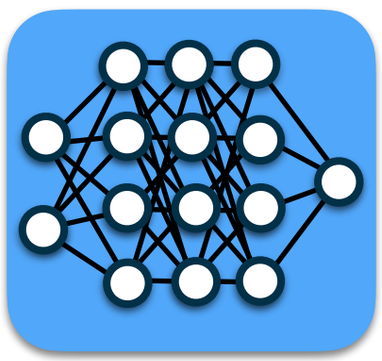
Guiseppi Cerati (FNAL), Katrin Heitmann (ANL), Walter Hopkins (ANL)



CompF02

Theory Calculations & Simulation

Peter Boyle (BNL), Daniel Elvira (FNAL), Ji Qiang (LBNL)



CompF03

Machine Learning

Phiala Shanahan (MIT), Kazu Terao (SLAC), Daniel Whiteson (Irvine)

CompF04

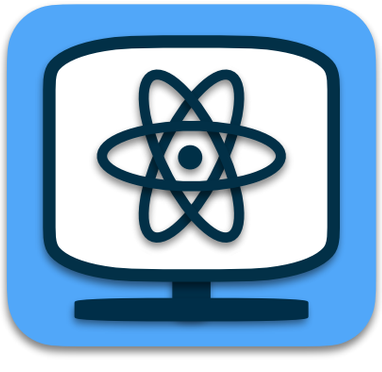
Storage and Processing Resource Access
(Facility and Infrastructure R&D)

Wahid Bhimji (NERSC), Rob Gardner (U. Chicago), Frank Würthwein (UCSD)

CompF05

End User Analysis

Gavin Davis (U. Mississippi), Peter Onyisi (U. Texas at Austin), Amy Roberts (UC Denver)



CompF06

Quantum Computing

Travis Humble (ORNL), Gabriel Perdue (FNAL), Martin Savage (U. Washington)

CompF07

Reinterpretation & Long-term Preservation of Data and Code

Kyle Cranmer (NYU), Mike Hildreth (Notre Dame), Matias Carrasco Kind (Illinois/NCSA)

Join us!

https://snowmass21.org/computational/start

SnowMass2021

- WELCOME PAGE
- ANNOUNCEMENTS
- SNOWMASS CALENDAR
- ETHICS GUIDELINES

- Organization

- SNOWMASS ADVISORY GROUP
- SNOWMASS STEERING GROUP
- FRONTIER CONVENERS

COMPUTATIONAL FRONTIER

Software and Computing are an integral part of the science process. High Energy Physics traditionally had the largest computing resource needs and subsequently most complex software stack in science. This is not true anymore, with many other science domains predicting equal or larger resource needs. The Computational Frontier will assess the software and computing needs of the High Energy Physics community emphasizing common needs and common solutions across the frontiers. We want to gain an overall understanding of the community's needs and discuss common solutions to them in the context of current and future solutions from the HEP community, other science disciplines and industry solutions. Our focus is to facilitate discussions amongst all frontiers and don't separate them into individual groups.

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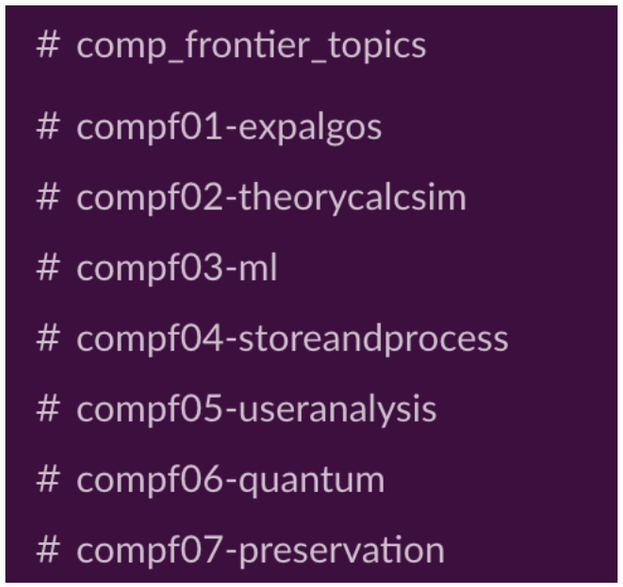
Join our Slack channels!



Join our topical group meetings!

indico

Join our email lists!

Topical groups

Name	Email List	Slack Channel
CompF1: Experimental Algorithm Parallelization	snowmass-compf01-expalgos[at]fnal.gov	#compf01-expalgos
CompF2: Theoretical Calculations and Simulation	snowmass-compf02-theorycalcsim[at]fnal.gov	#compf02-theorycalcsim
CompF3: Machine Learning	snowmass-compf03-ml[at]fnal.gov	#compf03-ml
CompF4: Storage and processing resource access (Facility and Infrastructure R&D)	snowmass-compf04-storeandprocess[at]fnal.gov	#compf04-storeandprocess
CompF5: End user analysis	snowmass-compf05-useranalysis[at]fnal.gov	#compf05-useranalysis
CompF6: Quantum computing	snowmass-compf06-quantum[at]fnal.gov	#compf06-quantum
CompF7: Reinterpretation and long-term preservation of data and code	snowmass-compf07-preservation[at]fnal.gov	#compf07-preservation

- Instructions to join a mailing list
- Instructions to join the Snowmass2021 Slack (at the end of the page)

Computational Frontier Scope

Our main time horizon should be ~10 years (HL-LHC, DUNE, LSST, etc.), but it is also useful to think about the next-to-next experiments and what R&D/funding opportunities we may need to be ready for the computing of the future.

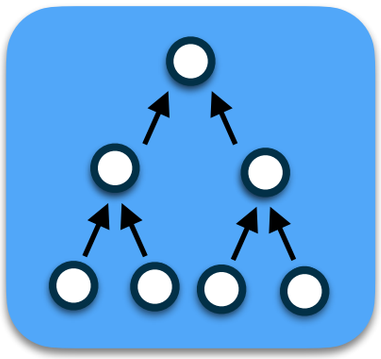
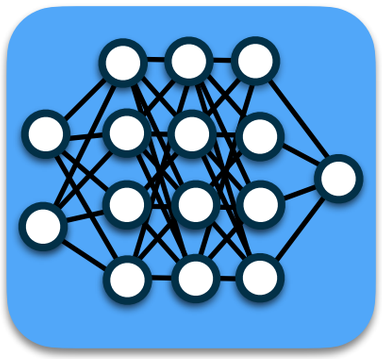
Time to “Think Big”

We should not be afraid to think about O(1) challenges and solutions to the physics of our future.

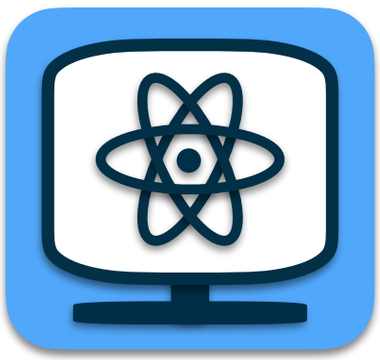
Some things to think about:

Relevant for theorists & experimentalists!

- Quantum computing was not part of the last Snowmass and machine learning was only briefly mentioned.
- Computing of the future will likely be much more heterogenous than the computing of today.
- The “intensity” and cosmic frontiers will soon have comparable data challenges to the energy frontier.
- Computing is a catalyst for building bridges to other areas of science and society at large.



We are looking forward to your participation!