Connections between the Computing and Neutrino Frontiers

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Neutrino Frontier Town Hall

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- Connections
- Guide to the Computing Frontier
- Ways to get involved

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  - How do we handle DUNE events too large to hold in memory?
  - How can we leverage machine learning to take full advantage of the power of LAr detectors?
- New computing paradigms create opportunities and challenges. Examples:
  - Processors are gaining cores, not speed, so our code must become parallel, too.
  - HPCs (supercomputers) have potentially enormous resources but using them requires specialized programming.
  - While physics was early to "big data," the rest of the world has caught up. How can we leverage more of the tools and techniques developed *outside* of physics?

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  - HPCs (supercomputers) have potentially enormous resources but using them requires specialized programming.
  - While physics was early to "big data," the rest of the world has caught up. How can we leverage more of the tools and techniques developed *outside* of physics?
- We don't need to address these challenges in isolation.
  - What can we learn from the energy frontier about how to handle internationally distributed data and computing?

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- Plus quantum computing, CompF6.

A note on timescales

- Computing is thinking about the ~next 10 years.
  - This is a little shorter timescale than other frontiers and stars now rather than some time in the future.
- Predictions about computers much further out get very difficult to make.
- Plus, we can make changes in computing more quickly than we can build new experiments.

- What this means: this frontier is of much greater relevance to **current experiments.**

How to get involved

- The computing frontier needs input from other frontiers since the computing necessarily supports the physics.
  - You want the computing to be there when you need it, too!

You can…

- Submit an LOI on something you are doing now or something you will need in the future.
  - Think about your resource needs:
    how much of **what** do you need **when**.
- Come to the Computing Workshop: August 10-11
  - Registration is now open!
- Connect with a working group and come to a more focused meeting.
  - These meetings are more frequent than the general workshops
  - Many opportunities to present and influence the frontier.

How to get in touch

Name	Email List	Slack Channel
General Computing Frontier		#comp_frontier_topics
CompF1: Experimental Algorithm Parallelization	snowmass-compf01-expalgos@fnal.gov	#compf01-expalgos
CompF2: Theoretical Calculations and Simulation	snowmass-compf02-theorycalcsim@fnal.gov	#compf02-theorycalcsim
CompF3: Machine Learning	snowmass-compf03-ml@fnal.gov	#compf03-ml
CompF4: Storage and processing resource access	snowmass-compf04-storeandprocess@fnal.gov	#compf04-storeandprocess
CompF5: End user analysis	snowmass-compf05-useranalysis@fnal.gov	#compf05-useranalysis
CompF6: Quantum computing	snowmass-compf06-quantum@fnal.gov	#compf06-quantum
CompF7: Reinterpretation and long-term preservation	snowmass-compf07-preservation@fnal.gov	#compf07-preservation