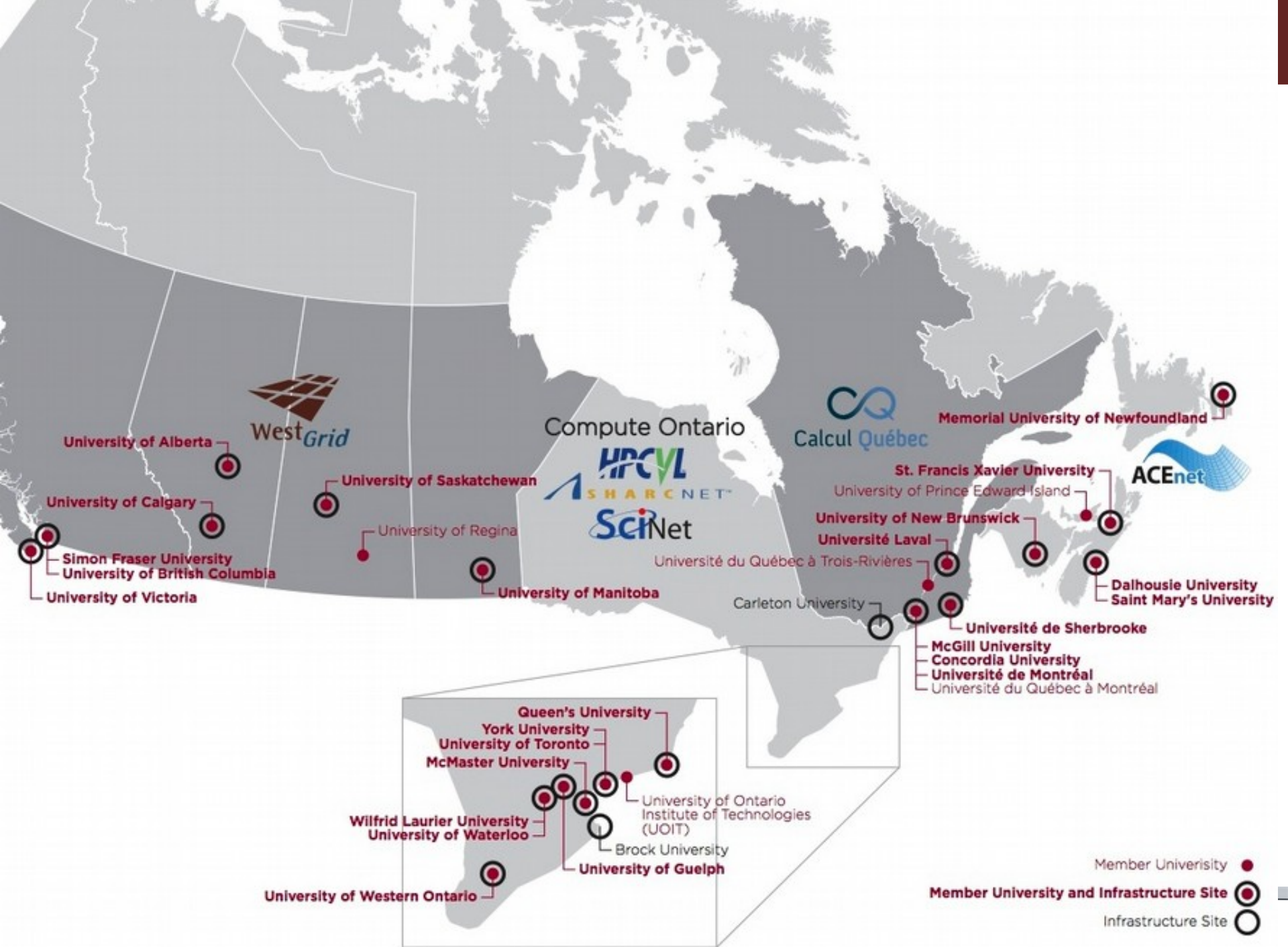


# Compute Canada: Computing for Nuclear Physics

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**CINP AGM**  
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# Who/what is Compute Canada?

- A national organization providing **“Advanced Research Computing”**.
- Mandated to support all research disciplines at a variety of scales in a variety of ways.
- We make things more efficient for researchers by sharing:
  - Data centre space, cooling, power
  - Expertise across disciplines and geography
  - CPUs with idle cycles
  - Storage arrays (hardware to serve storage)



# CC and Subatomic Physics

- Many subatomic physics projects in Canada are already taking advantage of CC resources.
- Within a single experiment, these allocations tend to be coordinated. May require a national MOU with host lab.
- CC allocations are made via peer-review process. Renewed each year (not ideal).
- There are other computing facilities in Canada that fall outside CC (eg. ATLAS Tier-1 at TRIUMF, some local facilities in universities).

# Who Funds This?

- Now – CFI funds almost all of the hardware (National Platforms, Special Opportunities, JELF, etc.) - matching required.
- CFI funds CC operations through Major Science Initiatives (MSI) programme (like SNOLAB) – matching required.
- CFI has not held a competition for shared cyberinfrastructure since 2006 National Platforms Fund (\$60M CFI to build current CC).
- CFI is currently consulting on a **\$50-\$75M cyberinfrastructure initiative**. Expected launch – this fall.
- Two components:
  - **Renewal of CC platform**
  - **Thematic data-intensive competition**

# CC Renewal

“The Compute Canada national platform is reaching the limits of its capacity, and the current computational services being offered are not necessarily designed to meet tomorrow’s research challenges. **Therefore, the CFI challenges the Compute Canada community to propose a set of capabilities and services that will meet the needs of Canadian researchers conducting data-intensive and computationally challenging research over the next five years.**”

# Thematic Competition

“...the CFI challenges institutions and their researchers to come together to propose cyber-infrastructure projects designed to create tailored and **shared integrated datasets**, data repositories or research data centres that will enable cutting-edge research on significant scientific, social and economic questions. These data-rich infrastructure resources could include **the organization and integration of large and sometimes highly complex datasets** in a research field **as well as the development of analytical tools** to fully exploit these datasets.”

# Interpretation

- Previous 2 pages from CFI consultation document. **Things can still change.** As of today....
- Unlike NPF, CFI wants a discipline-driven science competition. Some money is also provided to CC to maintain existing facilities.
- CFI also wants shared facilities and expects all proposals to at least consult with CC, most (all?) to be done in close cooperation.
- In other words, **researchers propose it, CC builds and operates it** with operations costs flowing through MSI...unless there is a strong argument against this model.



# What Does it Mean for CINP?

- The subatomic physics community is more coherent and more organized than most.
- Our computing needs have much in common:
  - big pipe to external labs
  - special software stacks for data movement and analysis
  - high ratio of disk to CPU
  - IO limited, different mix of floating point vs. integer operations than other fields
- Good candidate for thematic proposal!!

# Thematic Proposal?

- NOIs due in early 2015. Probably a strong filter already at NOI stage.
- Could join with particle physics and propose data processing centre (or 2 geographically separate ones) shared between experiments. Meet the needs of both big experiments and small.
- Between CINF and IPP, subatomic physics community can be organized quickly.



compute • calcul  
C A N A D A

## **COMPUTE CANADA ANNOUNCES: SUSTAINABLE PLANNING FOR ADVANCED RESEARCH COMPUTING (SPARC)**

*A national engagement of Canada's research community to create  
a national forecast of advanced research computing, data storage  
and archiving requirements.*

# We need to plan! - SPARC

- Compute Canada to build and operate the gear and support the researchers for both platform renewal and thematic competition.
- We need a **Sustainable Plan for Advanced Research Computing**.
- Kickstart with Cyberinfrastructure planning this year.
- **Need input** from disciplines, institutions, organizations, etc.:
  - **disciplinary whitepapers (IPP+CINP?)**
  - institutional strategic plans
  - analysis of current usage patterns
  - direct researcher feedback (surveys, [sparc@computecanada.ca](mailto:sparc@computecanada.ca))

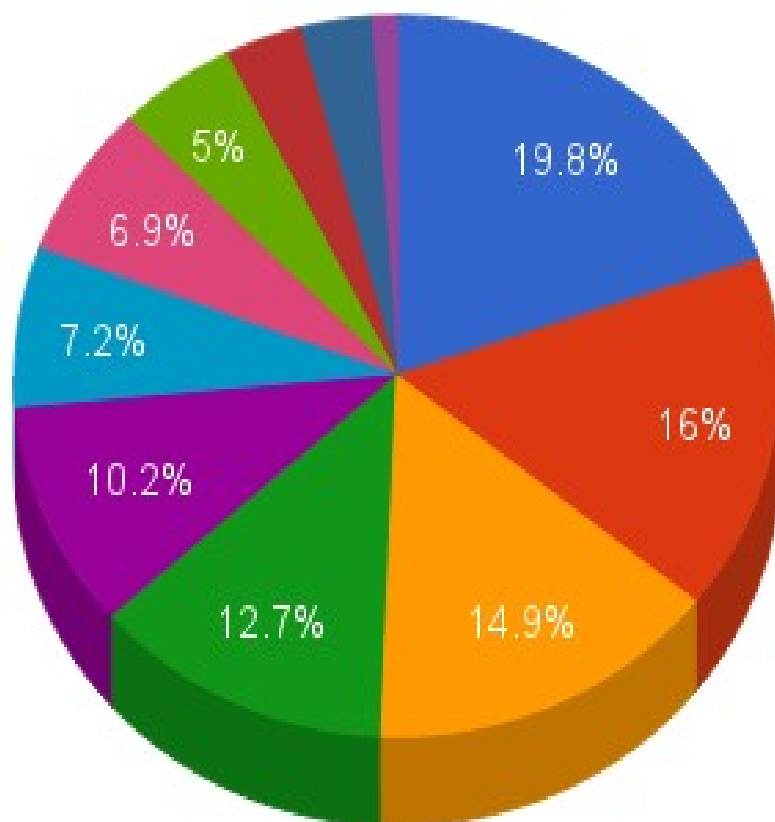
# Conclusions

- First **major cyberinfrastructure capital funding** since 2006 is on the horizon.
- **Subatomic physicists must make their voices heard** through telling CC what they need. Don't take for granted that the next set of resources will continue to serve the community well.
- Subatomic physicists have an opportunity to work together on a **thematic proposal**.
- **First step – aggregation of need in whitepaper for CC.**



# Who do we support today?

Nearly 2300 Active Faculty Accounts



- Engineering
- Biological and Life Sciences
- Physics
- Chemistry and Biochemistry
- Computer and Information Science
- Environmental and Earth Sciences
- Mathematics and Statistics
- Medical Science
- Social Science and Humanities
- Astronomy
- Business