



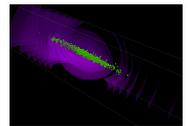
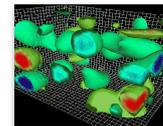
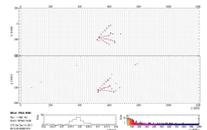
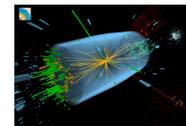
U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science

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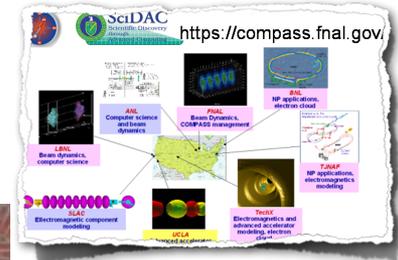
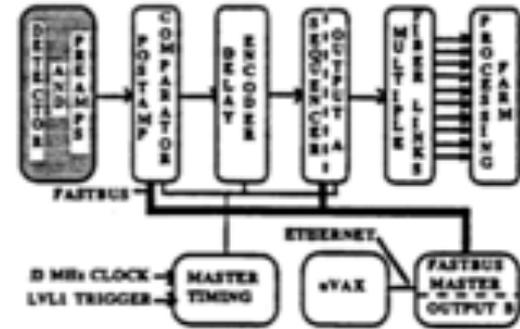
## State of the SCD

Panagiotis Spentzouris  
All-hands meeting  
February 20, 2015



# But first, introductions, since I am the new guy...

- I have been at the lab since 1989, working for Computing since 1998
  - Most recent research focus on accelerator physics and neutrinos
- During this time, I believe, I have interacted with most (at least SCD) folks. Of course, it is possible you don't recognize me, since the division head job really changes people...
- (Bad) joking aside, I enjoy my job, mostly because of how easy you make it with your work and dedication!
  - and I enjoy working with Rob and Jon, and the rest of the team...



Just before I accepted the SCD head job... it feels like 20 years ago...

# SCD Mission

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- Support all aspects of the mission of the laboratory and help maximize the **scientific output** of the Fermilab program,
- Serve our User Community and provide the facilities, technologies and software solutions needed for their science
- Provide excellent and efficient facilities, computing services and solutions that move the laboratory forward,
- Investigate emerging technologies and be prepared to take advantage of them when they mature

# A full plate: SCD Portfolio Drivers

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- Support the **CMS science program**,
- Support the diverse **FNAL muon and neutrino programs**, in all aspects of their computing needs,
- Support selected **Cosmic Frontier experiments** as per P5 and Fermilab priorities,
- **Maintain and upgrade our facilities** to the capacity and capability required for future needs of our programs,
- Optimize performance of **current and future FNAL accelerators**,
- **Perform R&D for new tools and services** to take advantage of emerging computing architectures and technologies
  - **Focus on selected high impact/relevance areas**

# Our Tactical Approach

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- Supporting the current program and preparing for the future requires significant investment, but manpower is limited. Leveraging resources and expertise is essential
  - Work **across lab organizations** to support the entire program
  - Build **collaborations with other institutions** to advance computing infrastructure and toolkits through **R&D**
- Provide cost effective, reliable facilities and computing services
  - Leverage expertise and tools from our successful CMS program to **develop a common approach** for the **neutrino and muon programs**, and make it available to all our users
  - Rely on the **Scientific Project Portfolio Management Process**, Service Management IT Infrastructure Library (ITIL) best practices, and the Computing Liaisons
    - Continuous feedback for planning and operations
    - Metrics for quality, availability and efficiency of services

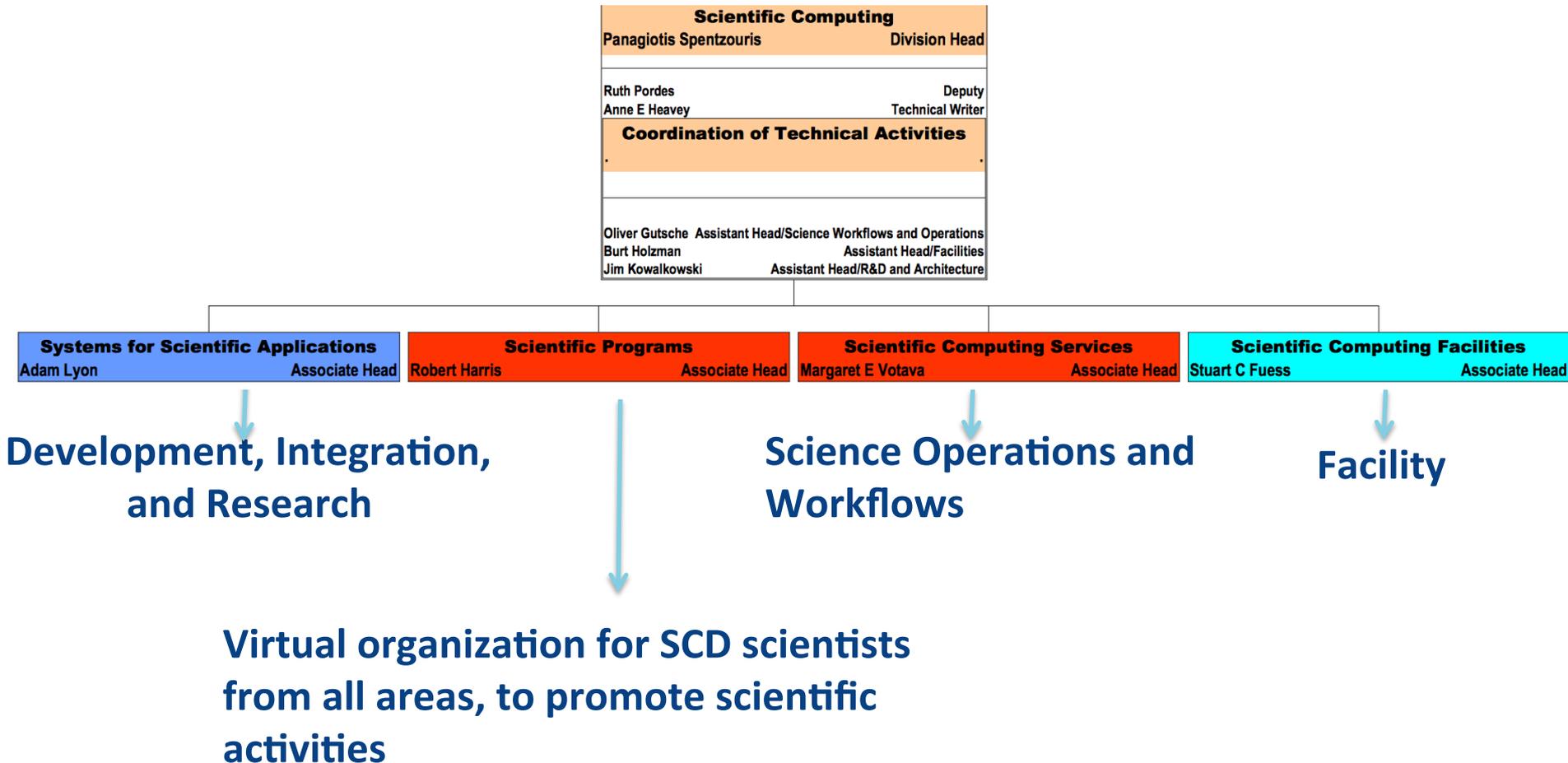
# SCD re-org

- Take the next step in better aligning the organization **along functional areas** of Scientific Computing
  - Establish high-level, cross-cutting, activity areas across the organization
  - Eliminate any remaining “stove-piping” for specific applications or experiments, enhance leveraging of resources and expertise
  - Provide a **common framework and “ecosystem” of tools and services** for planning and providing support for all experiments
- Tighter coordination across the activity areas, defined by overall service deliverables
  - Introduced area coordinators to complement and augment the line organization
  - Increase efficiency and quality of service

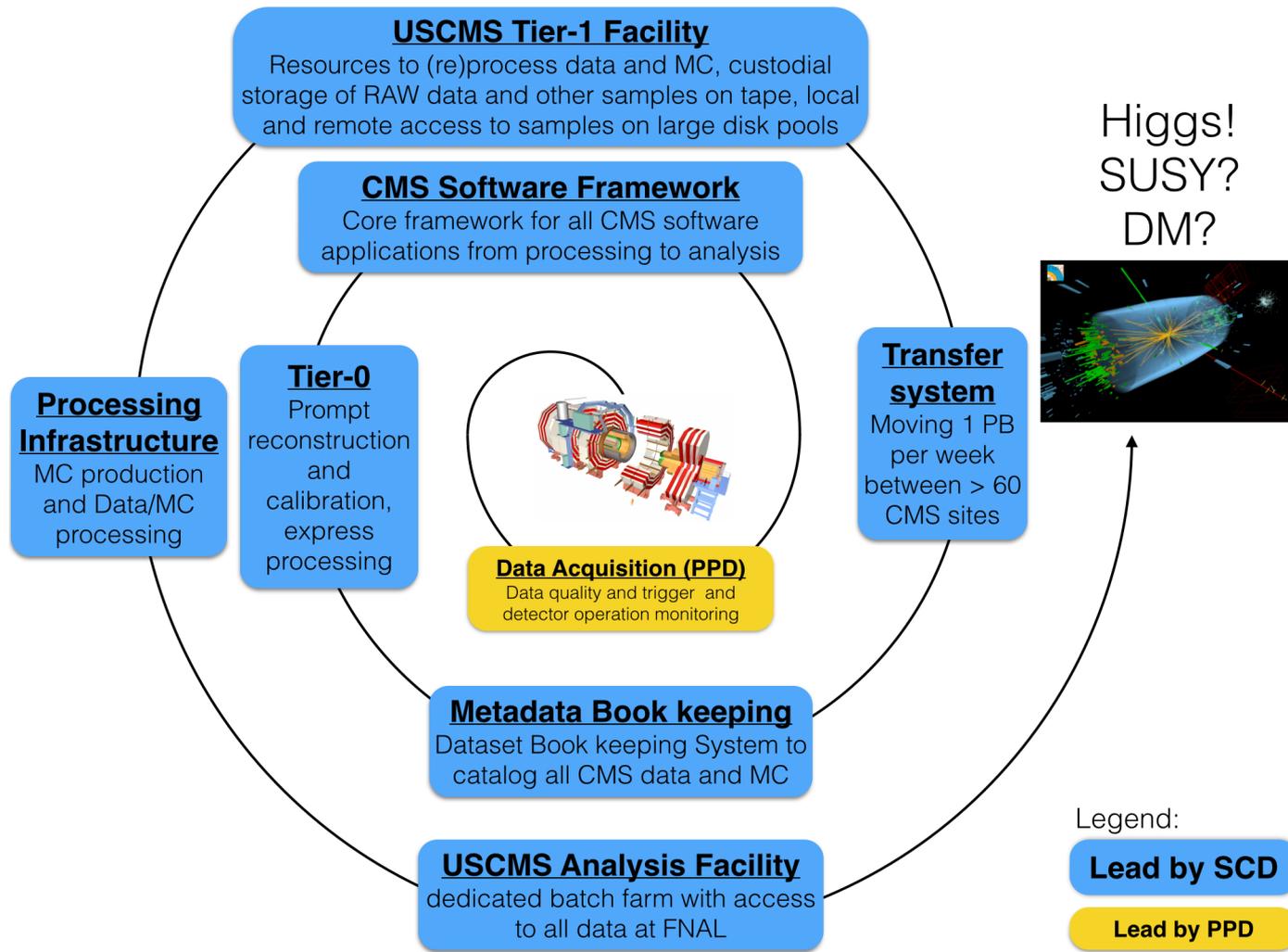
# Increasing organization agility: 3 major functional areas

- **Development, Integration and Research**
  - Complete stack for offline, simulation, and real-time software and engineering tools.
  - Develop and support the **software “products”** and **architecture** for the Facility, make them available to the community.
- **Scientific Facility**
  - An “über”Tier-1 center-like function for ALL of our users
    - Providing and managing resources and services for data storage, data processing and analysis (and DAQ for FNAL based experiments)
  - Tier-0 center-like function for users with such needs (recording & archiving data, ...)
- **Science Operations and Workflows**
  - Developing, configuring, and operating the actual applications for projects and experiments, utilizing the services provided by the facility

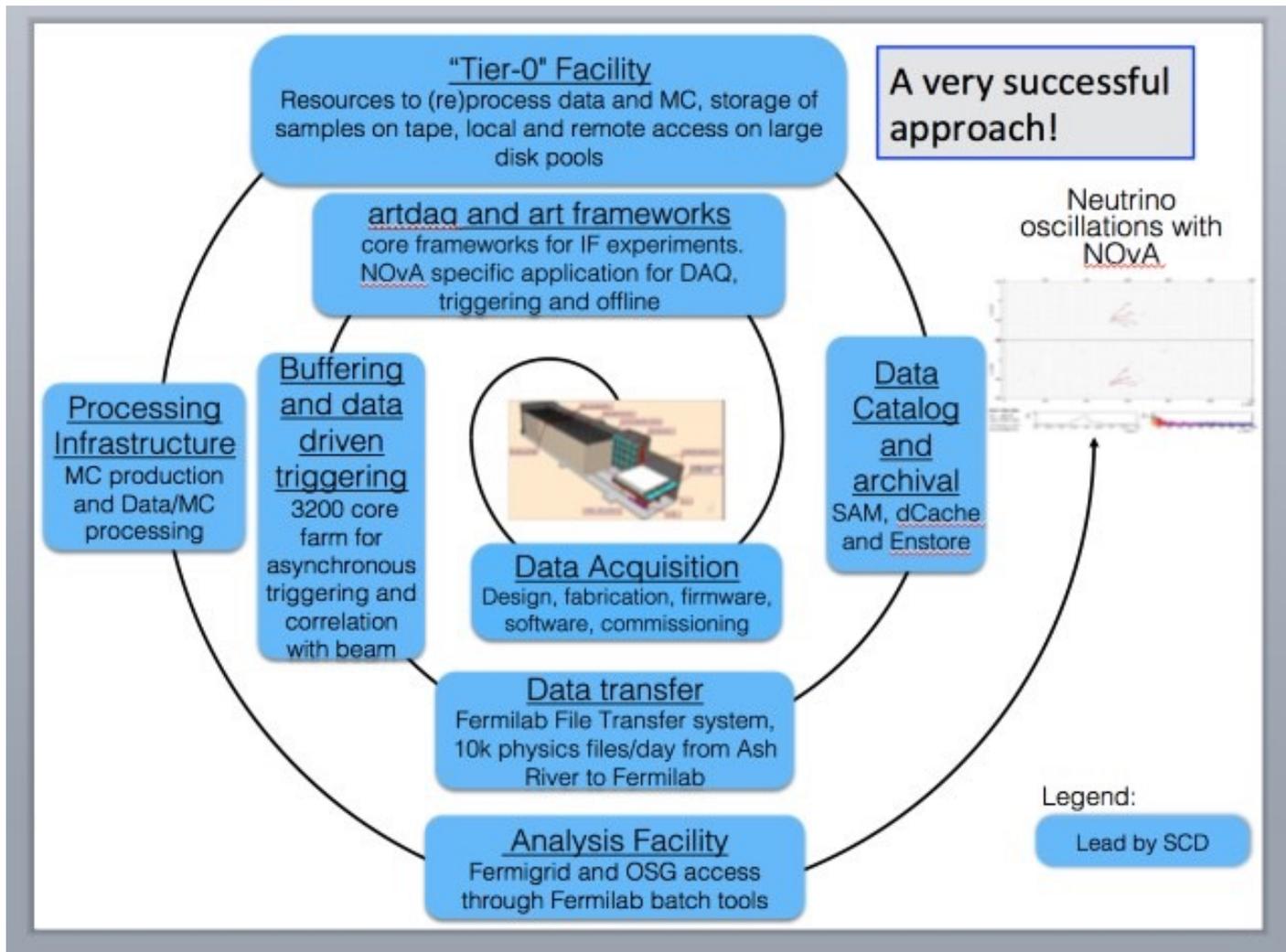
# Scientific Computing Division organization



# Our approach has been successful!



# ... in every frontier...



# Recognized by our users and the DOE...

From J. Kogut's  
(DOE/HEP, review  
chair) closeout talk

- Evaluation of the Big Picture items

## **The Review Team Concluded that (cont):**

- The Scientific Computing Tactical Approach is a sound one. By providing facilities and services across the lab there are not only efficiencies in the facilities but -- perhaps even more important -- broader use of best practices, software engineering, algorithms, etc. For example, the expertise and tools gained through the support of CMS computing have been applied and extended and made available to all users.
- The SCD is to be commended to for having generalized its Art framework and for already having implemented a multithreaded framework mode (*for CMS*), which enables users to take advantage of the current trend in many computer architectures
- The SCD R&D projects are targeted to important issues, such as the Active Archive Facility concept.
- Fermilab should be commended for taking the initiative in the development of the parallelized version of GeantV, which has the potential for significant impact within the broader community.

# Institutional Review

- You can find all talks, including John Kogut's closeout remarks at <https://indico.fnal.gov/conferenceTimeTable.py?confId=9353#20150213>
- Also, under "Auxiliary documents", <https://indico.fnal.gov/materialDisplay.py?materialId=4&confId=9353> , take a look at the scientific computing contribution.

## Going back to organization changes

- Lothar Bauerdick (USCMS Program Manager), BobT (PPD deputy) moved to PPD...
- Steve Wolbers is taking a long vacation to Oregon...
- We will miss them all (and, of course, we will continue working with Lothar and BobT in their new capacity)
- Ruth Pordes has agreed to serve as the SCD deputy (I am quite sure we don't need introductions here)
- Rob Harris is the new leader of the Scientific Programs quadrant
- Oliver Gutsche, Burt Holzman, Jim Kowalkowski are the new (and first) activity coordinators

# Highlights

- We (you!) have had many successes over the past few months, but since I spent all of (most likely more than) my allotted time on organization issues, I will just highlight Laboratory Directed R&D (LDRD) projects.
  - Out of thirteen currently funded projects across the lab, Computing has three:
    - GPUs for network packet analysis (CCD lead, P. DeMar with SCD participation)
    - DAQ & the internet of things (R. Rivera)
    - Automata Processors for next generation pattern recognition (M. Wang)

So, congratulations to the LDRD PIs, and congratulations to all of SCD for making our program a success!