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Introduction

Rob Kutschke

Reconstruction Group Planning Meeting

August 31, 2016

Welcome!

- This is the first in a series of meetings to survey the needs and interests of the stakeholders in the Reconstruction Group
 - Experiments and projects that can benefit from our services
 - Group members
 - Line management
- We will hear from the stakeholders about work they are doing and planning, in particular work where the Reconstruction Group may be able contribute.
- As our understanding develops, we will work with the stakeholders to define our priorities, scope of work and deadlines.

Agenda for Today

- Rob Kutschke 15 min:
 - Introduction to the Reconstruction Group
- Wes Ketchum 30 min:
 - Important Reconstruction Activities in MicroBooNE

Original Motivation – From FNAL PAC June 2015

Fermilab may want to consider creating a forum for exchanging ideas and for aiding progress on LAr event reconstruction. The issue is not just providing a common software platform (this is clearly critical) but also facilitating a forum where scientists (especially young ones) can discuss common issues. Fermilab may want to encourage the major LAr collaborations to consider mechanisms for effective and efficient parallel development and transfer of knowledge.

Scope has Broadened from PAC Suggestion

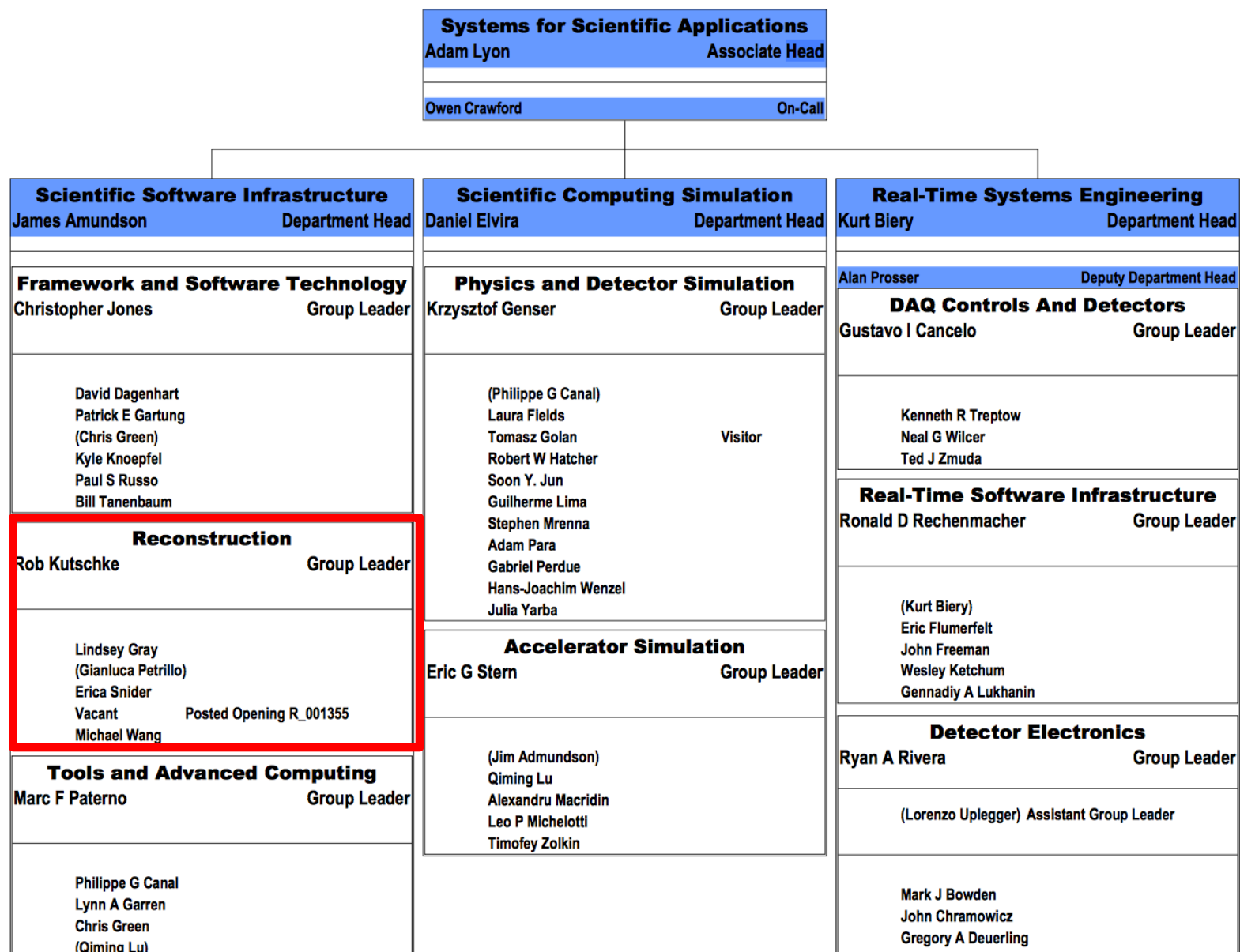
- Includes all of the Intensity Frontier (IF), not just LAr.
- Finding and fitting: tracks, showers, vertices; event classification
- Visualization in support of the above
- Concurrency in support of the above
- Machine learning in support of the above
- Use of High Performance/High Throughput Computing (HPC/HTC) in support of the above
- ...
- Cross-pollination among CMS and IF Experiments
- Access to software engineering advice
- See Adam Lyon's talk: [CD-doc-5619](#):

Where possible focus on the similarities of algorithms and techniques with a goal of common libraries for our common platforms.

My Understanding of our Charge:

- Two Mandates:
 - Assist and augment the efforts of experiments/projects
 - ie respond to requests from them
 - Explore new ideas and techniques that may be of value to the experiments/projects

Reconstruction Group – under CS-SCD-SSA-SSI Dept



Reconstruction Group Membership

Giuseppe Cerati	Joined 8/22/2016 from UCSD/CMS
Lindsey Grey	Moving to RTSE
Rob Kutschke	Group Leader; Mu2e
Erica Snider	LArSoft Project Lead
Robert Sulej	At CERN; home institute NCBJ, near Warsaw
Mike Wang	LDRD project: Micron Automata
(Gianluca Petrillo)	Home group TAC

Other People with Important, Closely Related Skills:

- People in the stakeholder community whom we hope will be willing to consult/participate/mentor when their expertise is valuable:
 - Currently working in reconstruction, are planning reconstruction work for their experiment/project, or have relevant previous experience:
 - Herb Greenlee, Tom Junk, Wes Ketchum, Gabe Perdue, Tingjun Yang
 - We hope to discover more
- Software engineering support:
 - Marc Paterno, Chris Jones and their groups; Jim Kowalkowski.

What group members are doing now:

- Underway before Reconstruction Group formed:
 - Robert Sulej: LArSoft Projection Matching Algorithm (PMA) and a machine learning project.
 - Mike Wang: Micron Automata LDRD project;
 - Lindsey Grey: CMS HGCal Reco; precision timing proposal
 - Erica Snider: LArSoft Project Lead
 - Gianluca Petrillo: LArSoft
- New work
 - Rob, Erica, Gianluca
 - Review of LArSoft Track3DKalmanHit module ([CD-doc-5708](#))
 - Review of LArSoft PMA ([CD-doc-5766](#))
 - Recommendations: LArSoft code review/analysis ([CD-doc-5765](#))
 - TrajCluster and BlurredCluster code reviews (LArSoft Usability Workshop)
 - Giuseppe
 - LArSoft Kalman filter usable as a final fitter

Project Suggestions from Line Management

- Respond to requests from experiments/projects
- Work with experiments to find synergies
- Continue the investigation of Paraview visualization
- Package a machine learning example in a toolkit
- Propose a machine learning project for the INCITE program
 - <http://www.doeleadershipcomputing.org/incite-program/>

What's Next

- This series of meetings will continue
 - Most meetings will be Wed 9:00 AM CDT
 - May need some at other times – speakers with conflicts.
 - Guess that 3-5 weeks will cover everything
- I am working on an agenda for the next few weeks