

# MUON G-2

# COMPUTING REVIEW

**MIKE KIRBY - FERMILAB/SCD**

- committee introductions
- charge to the committee
- schedule

# LOGISTICS

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- this laptop will be available for making presentations
- otherwise vga or hdmi cable available
- no food or drink allowed in the lecture hall - water is fine
- there is coffee out near the restrooms
- please consider this a conversation- expect questions during talks

# COMMITTEE

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- Kurt Biery (Real-Time Systems Engineering Dept Head)
- Giuseppe Cerati (Scientific Software Infrastructure - Reconstruction)
- Burt Holzman (Coordination of Technical Activities - Associate Head / Facilities)
- Mike Kirby - Chair (Scientific Distributed Computing Solutions - Assoc Dept Head)
- Kyle Knoepfel (Scientific Software Infrastructure - Framework & Software Technology)
- Jim Kowalkowski (Coord. of Technical Activities - Assoc Head / R&D & Architecture)
- Andrew Norman (Coord. of Technical Activities - Assoc Head / Sci Workflow & Ops)
- Gabe Perdue (Scientific Computing Simulations - Physics and Detector Simulations)
- Stephen White (Scientific Data Processing Solutions - Scientific Database Applications)

# CHARGE

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The g-2 collaboration is preparing to begin data taking in late Spring of 2017 to commission beam and detector systems, followed by physics data taking over the next few years. The experiment spokes and SCD management would like the committee to review and evaluate the online and offline software and computing infrastructure readiness of the experiment for successfully carrying out the planned commissioning and physics analysis tasks. In particular, the reviewers should comment on:

1. The current offline computing infrastructure and tools, including build and release tools, simulation tools, framework, analysis tools and approaches, database, workflow, workflow management, data management, and operations. Is the experiment efficiently leveraging tools and expertise offered by SCD? Does the experiment have sufficient resources to implement, deploy and operate the infrastructure?

# CHARGE

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2. The current online computing infrastructure and tools, including DAQ systems for the precession frequency measurement and the magnetic field, online monitoring, nearline analysis for data quality checks, database and slow control monitoring. Does the experiment have sufficient resources to implement, deploy and operate the infrastructure? Is there enough familiarity with the experiment's approaches and solutions in SCD to be able to provide expert consultation if necessary?
3. Are the tools, infrastructure, and established processes sufficient to engage non-expert resources from the collaboration? Are best practices employed in these processes?

The committee is charged with producing a written report by the end of November 2016 that addresses these questions and makes recommendations for correcting any problems or issues identified.

# SCHEDULE

## MONDAY MORNING

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### MONDAY PLENARY SESSIONS

#### Morning Plenary (3.5 hrs including break)

1. **Executive Session** 30 min
2. **Welcome and Introductions** 5 min
3. **Muon g-2 Orientation and Computing Overview** (D.Hertzog) 45+15
  - a. What is required to make the omega\_a and omega\_p measurements
  - b. What beamline and ring simulation deliverables are required to run and analyze g-2?
  - c. Final analysis deliverables, manpower and timeline
  - d. Outline collaboration structure (ORD chart)

#### BREAK (15 min)

4. **DAQ Overview I** (W. Gohn – if Tim is available we propose to split into two 20+10 talks) 40+10
  - a. *Data rates, fill structure, MIDAS, network infrastructure, security*
  - b. *GPU algorithms, 1 slide tracker DAQ, 1 slides aux det DAQ, 1 slide slow DAQ*
5. **Offline Analysis Overview** (A. Lyon) 40+10
  - a. *Art gm2 framework and offline code structure*
  - b. *Data management and production workflow*
  - c. *Introduce near-line production*

#### LUNCH (1hr)

# SCHEDULE

## MONDAY AFTERNOON

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### Afternoon Plenary (3 hrs including break)

6. **Simulation Overview** (J. Stapleton) 30+15
  - a. *Specific simulation use cases*
  - b. *Gm2ringsim geometry and guns*
  - c. *Short intro to Beamline Simulation*
7. **Tracking Algorithms** (T. Walton) 20+10
8. **Calorimeter Algorithms** (A. Feinberg) 20+10

### BREAK (15 minutes)

9. **Tip-to-tail SLAC** Calorimeter test run (K-S Khaw) 20+10
10. **Tip-to-tail FNAL** Strawtracker test run (J. Price) 20+10
11. **Wrap-up** Collaboration response to charge (R. Fatemi) 15

### EXECUTIVE SESSION (30 min)

# SCHEDULE

## TUESDAY MORNING

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### TUESDAY BREAKOUT SESSIONS

#### A. ONLINE & OFFLINE (2.5 hrs)

1. Database Infrastructure (D. Li) 20+10
2. Magnetic Field DAQ + in-fill data (M. Smith) 20+10
3. Data Quality Management (W. Gohn) 20+10
4. Nearline with focus on fast physics processing (K-S Khaw) 20+10
5. Slow Controls and Vanya's monitoring (M. Eads) 20+10

#### B. SIMULATION + ALGORITHMS + ANALYSIS (3 hrs)

1. Beamline Simulation Overview (Stratakis) 20+10
2. Paraview Visualization Tools (A. Lyon) 20+10
3. CADMesh Geometries (L. Welty-Reiger) 20+10
4. Magnetic Field Analysis (R. Hong) 20+10
5. Job Submission and Workflow (T. Walton) 20+10
6. Verification Package (R. Fatemi) 20+10

- will present findings in slides at close-out session Wednesday at 10:00 am, Black Hole



# THOUGHTS

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- thanks to all of the collaboration members for putting together talks
- looking forward to learning more about the experiment and helping to bolster the computing at g-2
- anticipate a productive two days
- remember to vote tomorrow