

Experiment Management

Sam Zeller (Fermilab)

MicroBooNE Operational Readiness Review

November 23, 2015

- last talk: what we're trying to accomplish and how we got there
- this talk: who we are and how we are managed

Nov. 21, 2015

*spokespeople

MicroBooNE Collaboration

charge
question #1

University of Bern, Switzerland: M. Auger, A. Ereditato, D. Goeldi, I. Kreslo, D. Lorca, M. Lüthi, C. Rudolf von Rohr, J. Sinclair, M. Weber

Brookhaven: M. Bishai, H. Chen, J. Joshi, B. Kirby, Y. Li, D. Lissauer, M. Mooney, X. Qian, V. Radeka, C. Thorn, B. Yu, C. Zhang

University of Cambridge: J. Jan de Vries, J. Marshall, M. Thomson, J. Weston

University of Chicago: W.M. Foreman, J. Ho, D.W. Schmitz, J. Zennaro

University of Cincinnati: R. Grosso, R.A. Johnson, J. St. John

Columbia University: L. Camilleri, D. Caratelli, J. Crespo, V. Genty, D. Kaleko, W. Seligman, M. Shaevitz, K. Terao

Fermilab: R. Acciarri, L. Bagby, B. Baller, B. Carls, F. Cavanna, R. Castillo Fernandez, H. Greenlee, C. James, H. Jostlein, W. Ketchum, M. Kirby,

T. Kobilarcik, S. Lockwitz, B. Lundberg, A. Marchionni, O. Palamara, Z. Pavlovic, S. Pordes, J.L. Raaf, G. Rameika, A. Schukraft,

E. Snider, P. Spentzouris, T. Strauss, M. Toups, T. Yang, G.P. Zeller*

Illinois Institute of Technology: R. An, B. Littlejohn

Kansas State University: T. Bolton, S. Gollapinni, G. Horton-Smith, V. Meddage, A. Rafique, S. Shrestha

Lancaster University: A. Blake, D. Devitt, A. Lister

Los Alamos: G. Garvey, W.C. Louis, G.B. Mills, R. Van de Water

University of Manchester: D. Cianci, A. Furmanski, J. Hewes, C. Hill, G. Karagiorgi, R. Murrells, D. Porzio, S. Söldner-Rembold, A.M. Szelc

MIT: L. Bugel, J.M. Conrad, J. Moon, M.H. Moulai, T. Wongjirad

University of Michigan, Ann Arbor: J. Mousseau, J. Spitz

New Mexico State University: T. Miceli, V. Papavassiliou, S. Pate, K. Woodruff

Oregon State University: H. Schellman, S. Wolbers

Otterbein University: N. Tagg

University of Oxford: G. Barr, M. Bass, A. Laube, R. Soleti, M. Del Tutto, R. Guenette

University of Pittsburgh: S. Dytman, N. Graf, L. Jiang, D. Naples, V. Paolone

Pacific Northwest National Laboratory: E. Church

Princeton University: K. McDonald

Saint Mary's University of Minnesota: P. Nienaber

SLAC: M. Convery, B. Eberly, L. Rochester, Y-T. Tsai, T. Usher

Syracuse University: J. Esquivel, G. Pulliam, M. Soderberg

University of Texas at Arlington: J. Asadi

Tubitak Space Technologies Research Institute, Turkey: F. Bay, B. Kocaman, M. Kopru

Virginia Tech: C.M. Jen, C. Mariani

Yale University: C. Adams, B.T. Fleming*, E. Gramellini, A. Hackenburg, X. Luo, B. Russell, S. Tufiani

140 collaborators

28 institutions

(6 non-U.S.)

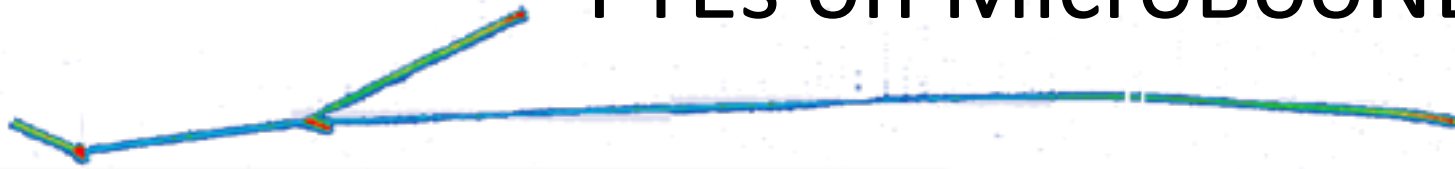
32 postdocs

35 grad students

11/23/15

charge
question #1

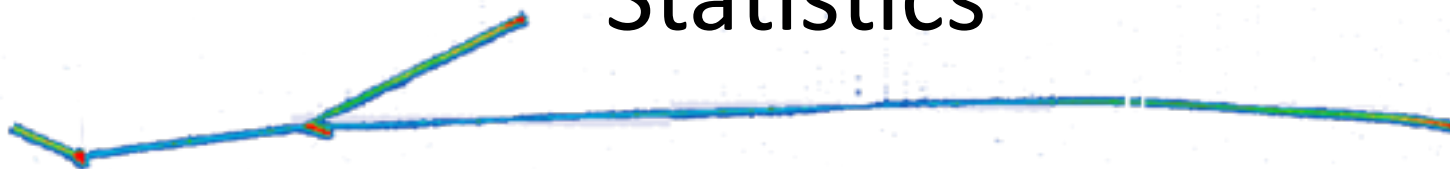
FTEs on MicroBooNE



| Institution | # MicroBooNE collaborators | # FTE |
|------------------------|----------------------------|-------------|
| Bern | 9 | 2.65 |
| Brookhaven | 12 | 3.65 |
| Cambridge | 4 | 2.85 |
| Chicago | 4 | 1.20 |
| Cincinnati | 3 | 1.80 |
| Columbia | 8 | 4.23 |
| Fermilab | 27 | 11.3 |
| IIT | 2 | 1.25 |
| Kansas State | 6 | 3.80 |
| Lancaster | 3 | 2.20 |
| Los Alamos | 4 | 0.50 |
| Manchester | 9 | 6.85 |
| MIT | 5 | 2.68 |
| Michigan | 2 | 0.75 |
| New Mexico State | 4 | 2.40 |
| Oregon State | 2 | 1.30 |
| Otterbein | 1 | 0.25 |
| Oxford | 6 | 4.00 |
| PNNL | 1 | 0.25 |
| Pittsburgh | 5 | 2.80 |
| St Mary's of Minnesota | 1 | 0.25 |
| SLAC | 5 | 3.70 |
| Syracuse | 3 | 1.75 |
| Texas, Arlington | 1 | 0.60 |
| Tubitak | 3 | 1.50 |
| Virginia Tech | 2 | 1.00 |
| Yale | 7 | 4.00 |
| | 140 | 69.6 |

- FTE were provided by the PI of each institution
- sums to 70 FTE of collaborator effort on MicroBooNE

Statistics



some statistics on the collaboration:

- 48% are young people (*67 students & postdocs*)
- 40% are on-site at FNAL (*most of the students & postdocs are based at FNAL*)
- 24% are from non U.S. institutions (*Switzerland, Turkey, U.K.*)
- 20% are FNAL personnel

we've had a growth spurt recently ...

- 25 new collaborators joined MicroBooNE in the last 3 months
(*this includes 15 graduate students, 9 postdocs, 1 senior scientist*)
- 8 new institutions added over the past year – most by cell division
(*IIT, Lancaster, Manchester, Michigan, Oregon State, PNNL, Tubitak, UT Arlington*)

Postdoc Placements

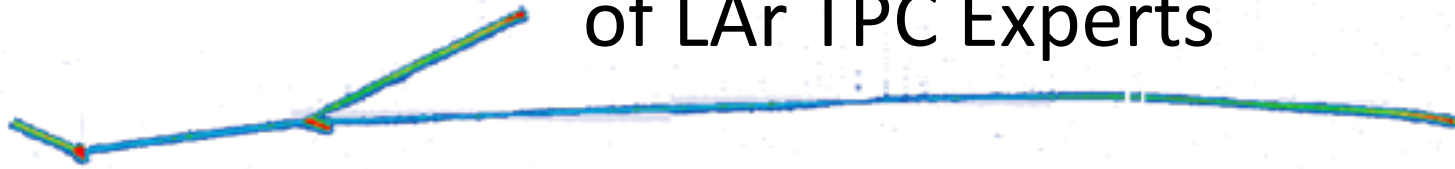


- in the last 3 years, 17 of our postdocs have landed their next position, all in particle physics; majority have remained on MicroBooNE (13/17)

- (1) *Roxanne Guenette, Oxford, STFC Rutherford Fellow*
- (2) *David McKee, Missouri Southern State University, Assistant Professor*
- (3) *Mike Cooke, DOE, AAAS Science & Technology Policy Fellow*
- (4) *Tepei Katori, Queen Mary University of London, Lecturer*
- (5) *Georgia Karagiorgi, Manchester, Lecturer*
- (6) *Bryce Littlejohn, IIT, Assistant Professor*
- (7) *Tingjun Yang, FNAL, Applications Physicist, ND*
- (8) *Zarko Pavlovic, FNAL, Applications Physicist, ND*
- (9) *Andrzej Szelc, Manchester, Lecturer*
- (10) *Eric Church, PNNL, Scientist*
- (11) *Wes Ketchum, FNAL, Associate Scientist, SCD*
- (12) *Andy Blake, Lancaster, Lecturer*
- (13) *Josh Spitz, Michigan, Ann Arbor, Assistant Professor*
- (14) *Thomas Strauss, FNAL, Associate Scientist, TD*
- (15) *Matt Toups, Associate Scientist, ND*
- (16) *Jonathan Asaadi, UT Arlington, Assistant Professor*
- (17) *Leonidas Kalousis, Vrije Universiteit Brussel, Research Associate*

- 6 U.S. lab
- 5 U.K. university
- 4 U.S. university
- 1 U.S. government
- 1 second postdoc

Training the Next Generation of LAr TPC Experts



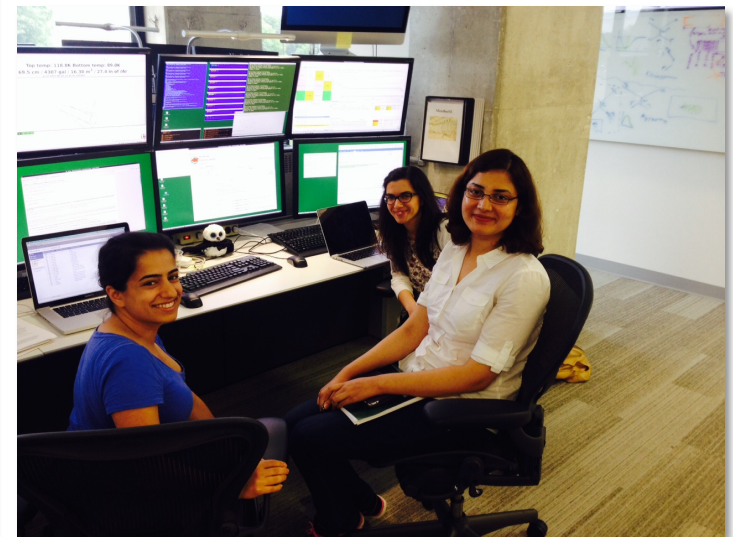
- we are extremely fortunate to have a lot of students & postdocs who actively participated in detector construction & commissioning, and who worked to get us ready for first data with this new detector



*M. Mooney (BNL),
J. Joshi (BNL),
Y. Li (BNL)*



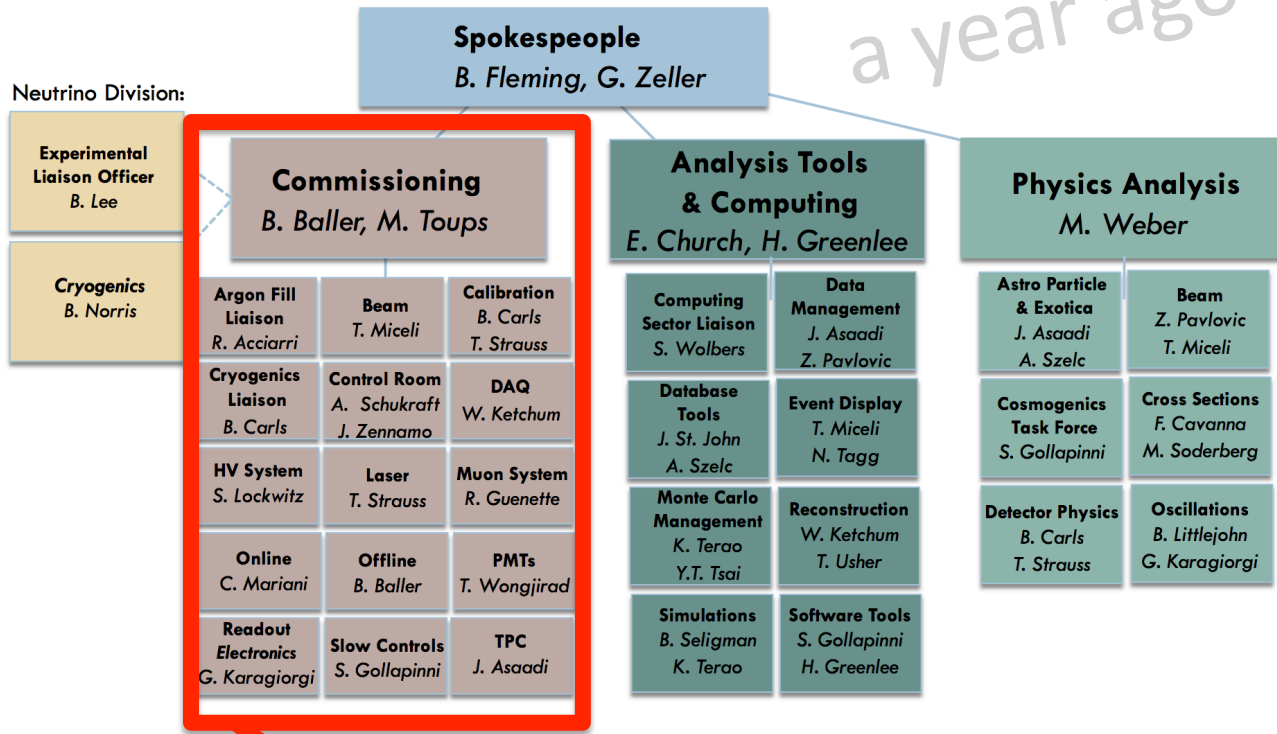
*S. Gollapinni (KSU), D. Caratelli (Columbia),
D. Kaleko (Columbia)*



*M. Moulai (MIT),
Georgia Karagiorgi (Manchester),
Aleena Rafique (KSU)*

Organization

MicroBooNE Collaboration Organizational Chart



a year ago

- this is what the organization looked like a year ago

- Bruce Baller's talk (commissioning)
- 2-day internal review - Sept 2015

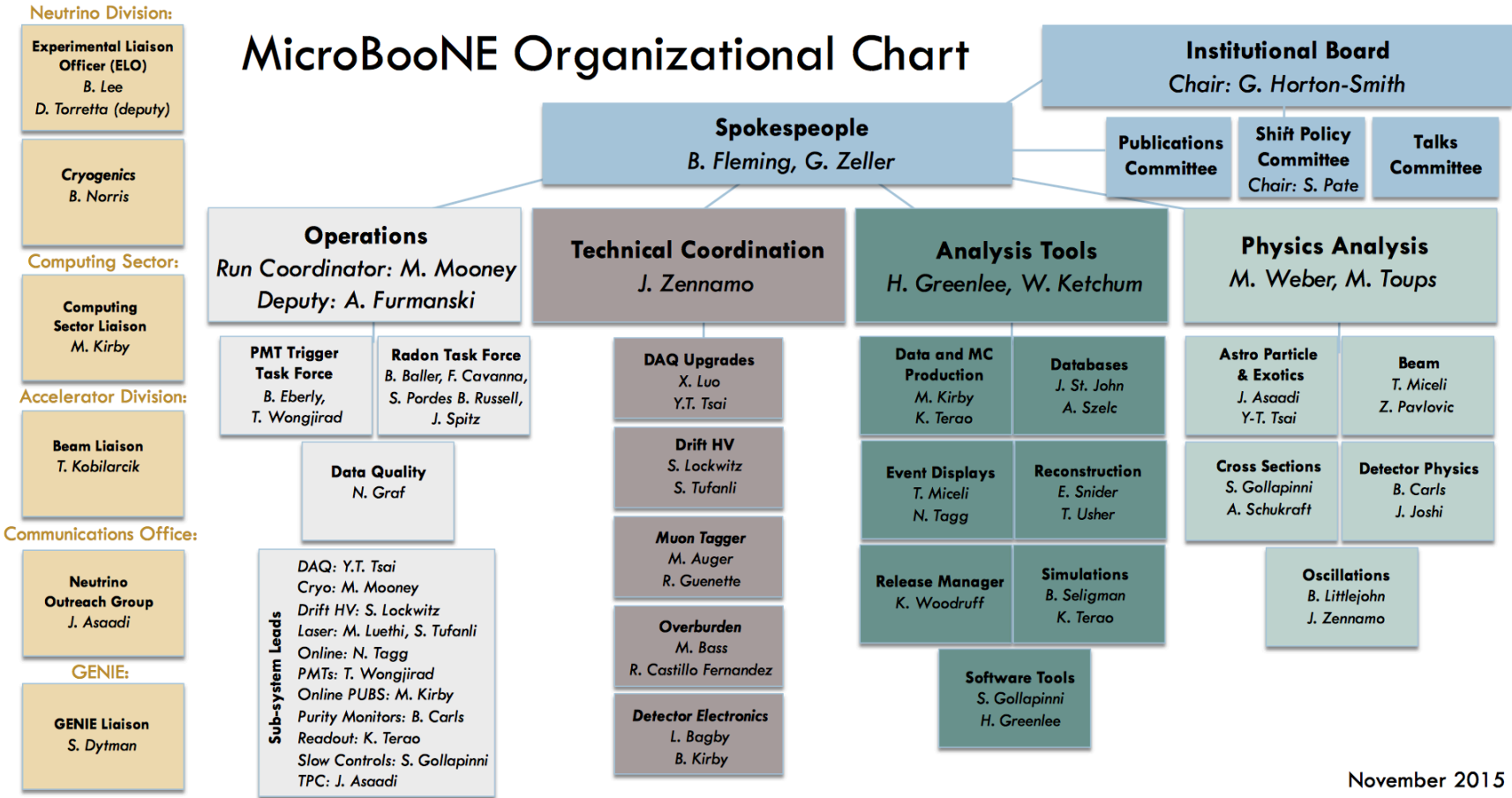
subgroups led by PDs

December 2014

Organization



MicroBooNE Organizational Chart

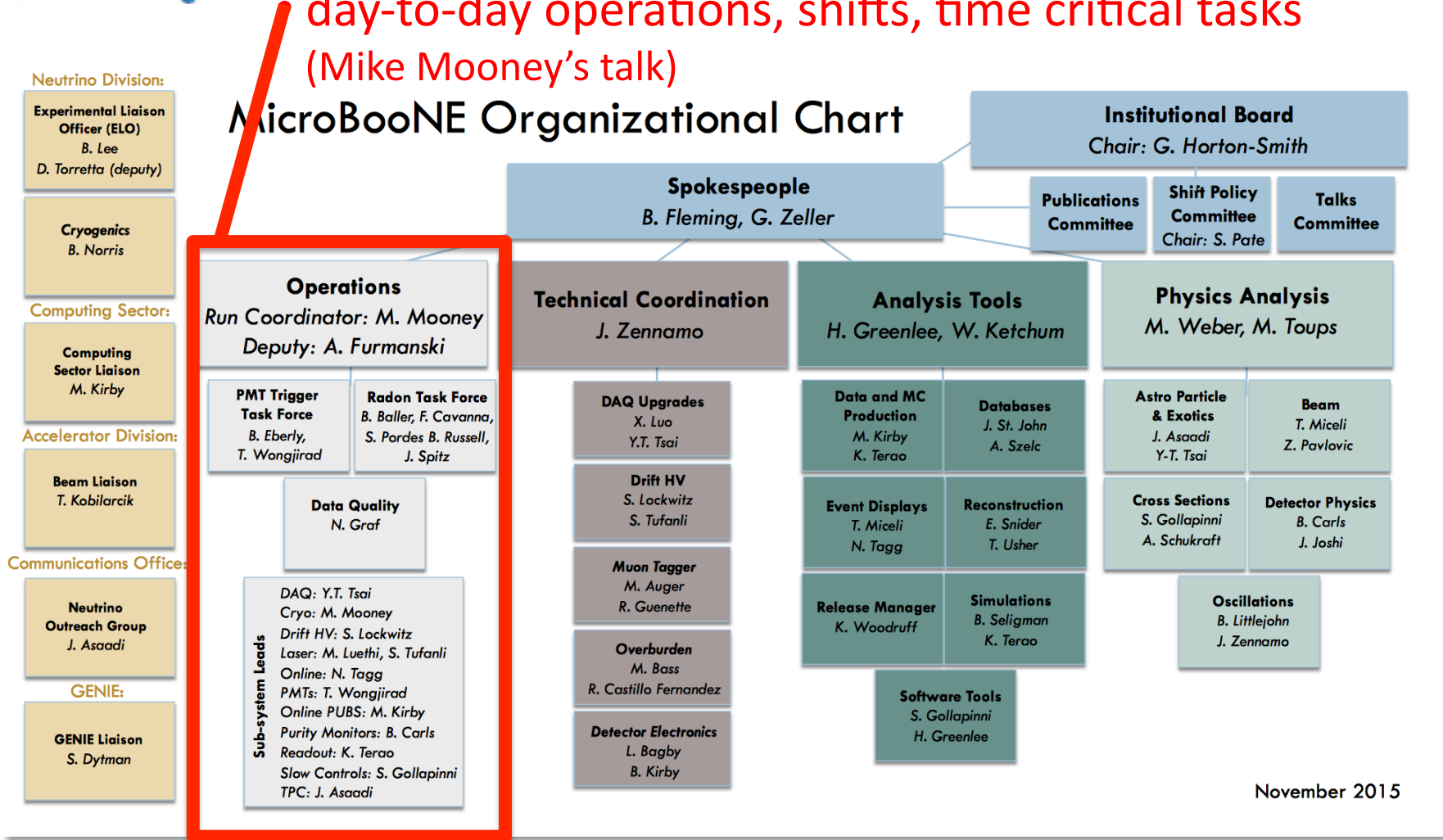


November 2015

Organization

day-to-day operations, shifts, time critical tasks
(Mike Mooney's talk)

MicroBooNE Organizational Chart

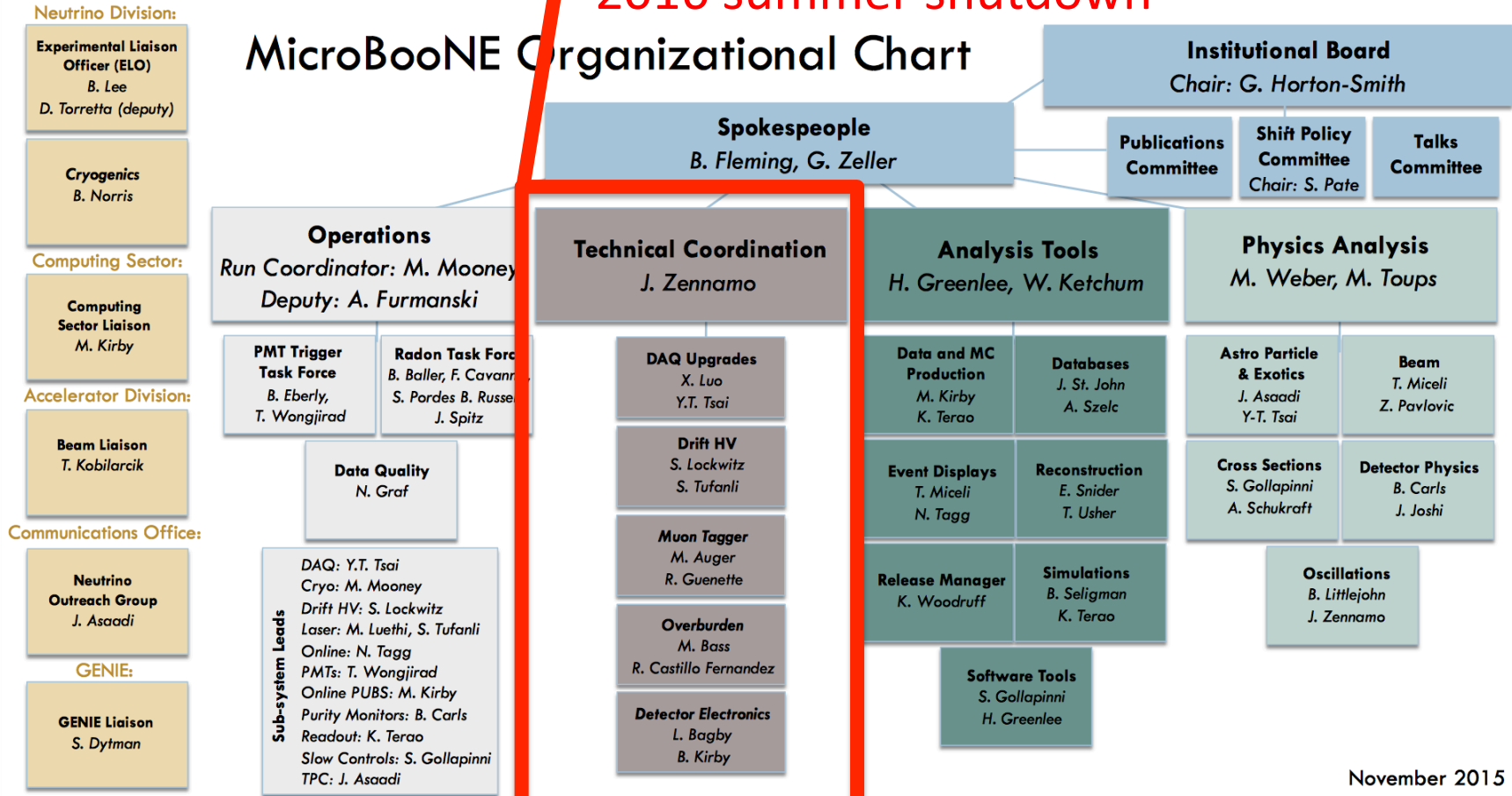


November 2015

Organization

longer term activities; preparations for 2016 summer shutdown

MicroBooNE Organizational Chart

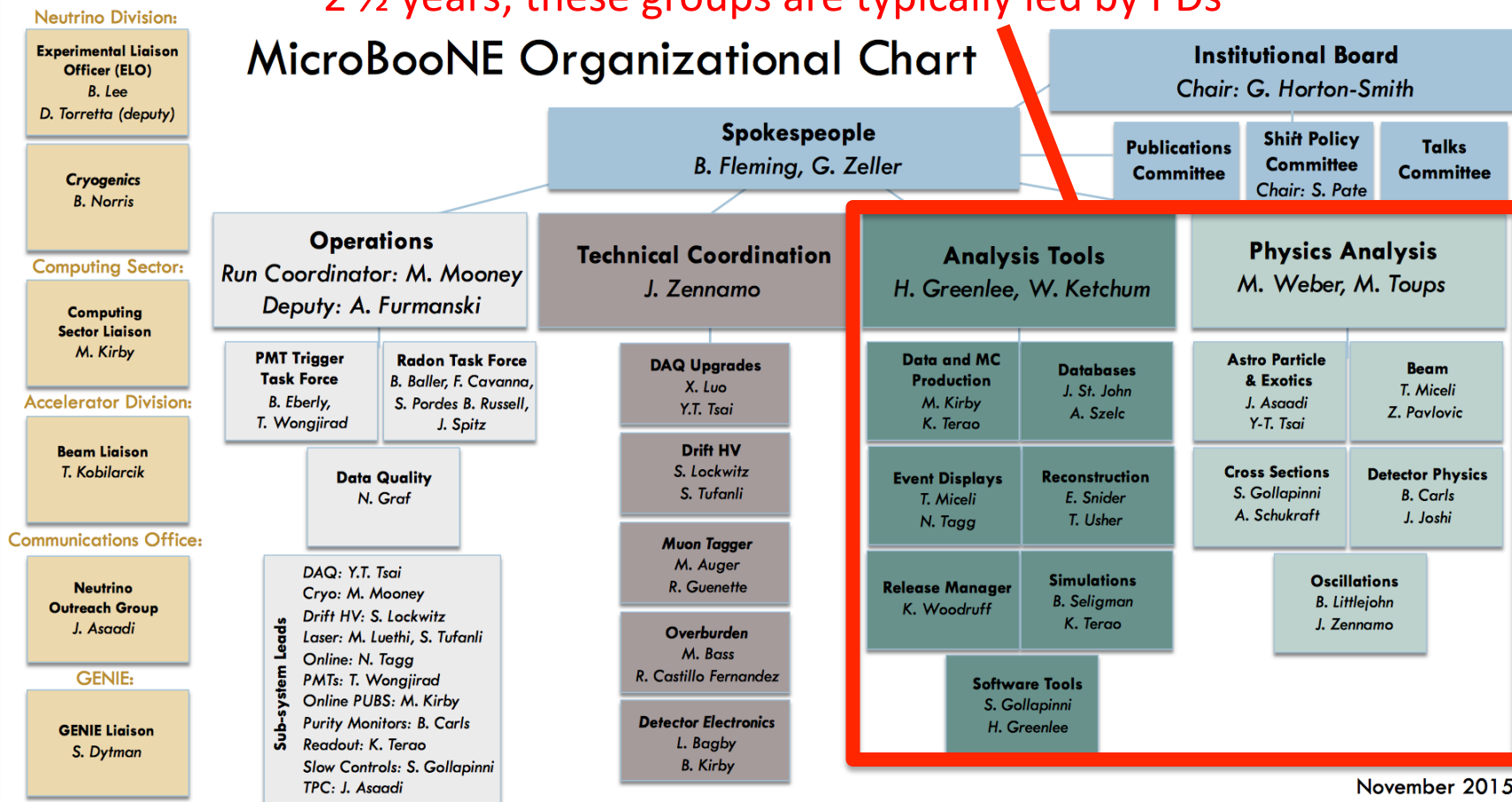


November 2015

Organization

- AT and physics groups have been meeting regularly for the past 2 ½ years; these groups are typically led by PDs

MicroBooNE Organizational Chart

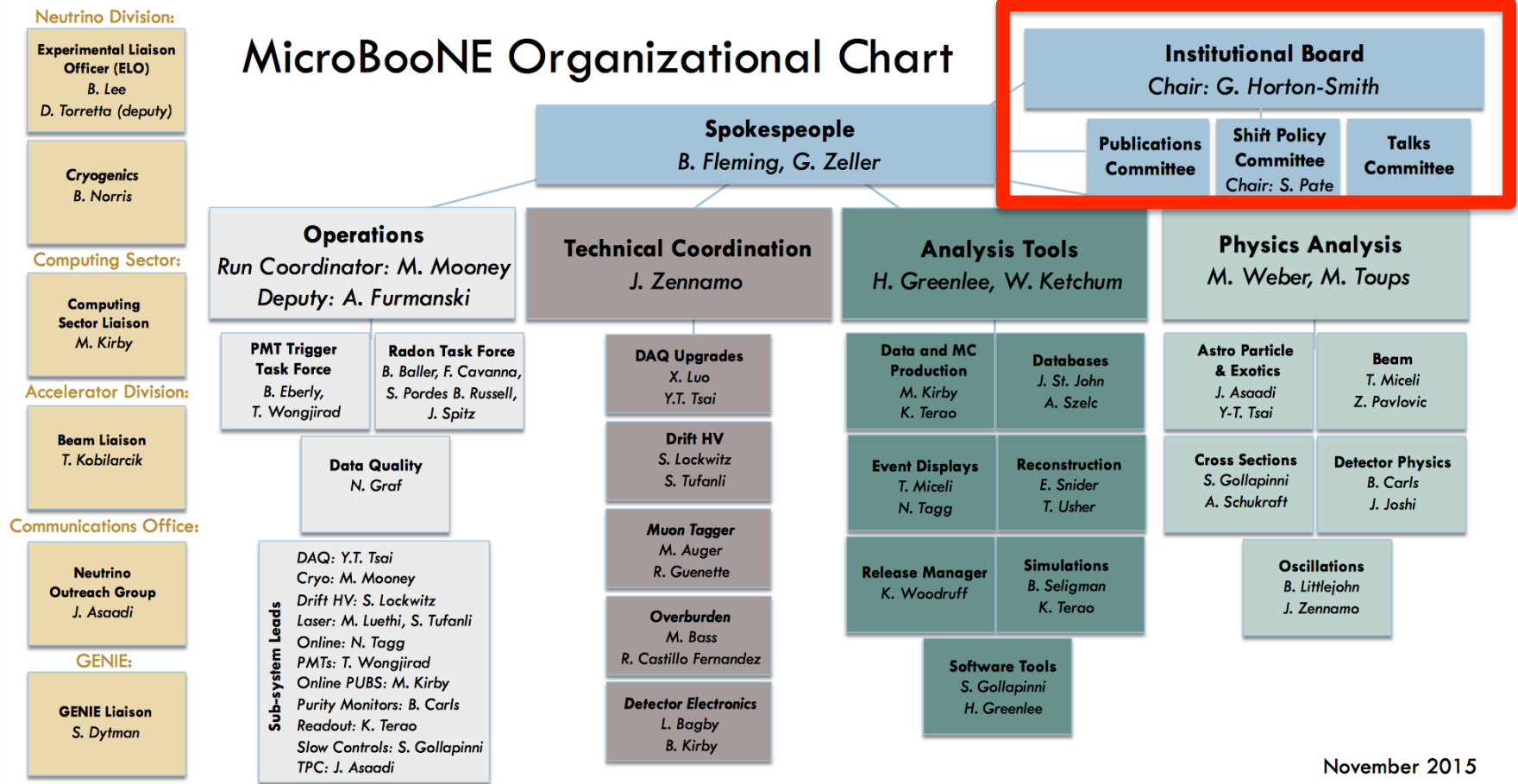


November 2015

Organization

- IB + FSRS meets at every collaboration meeting

MicroBooNE Organizational Chart

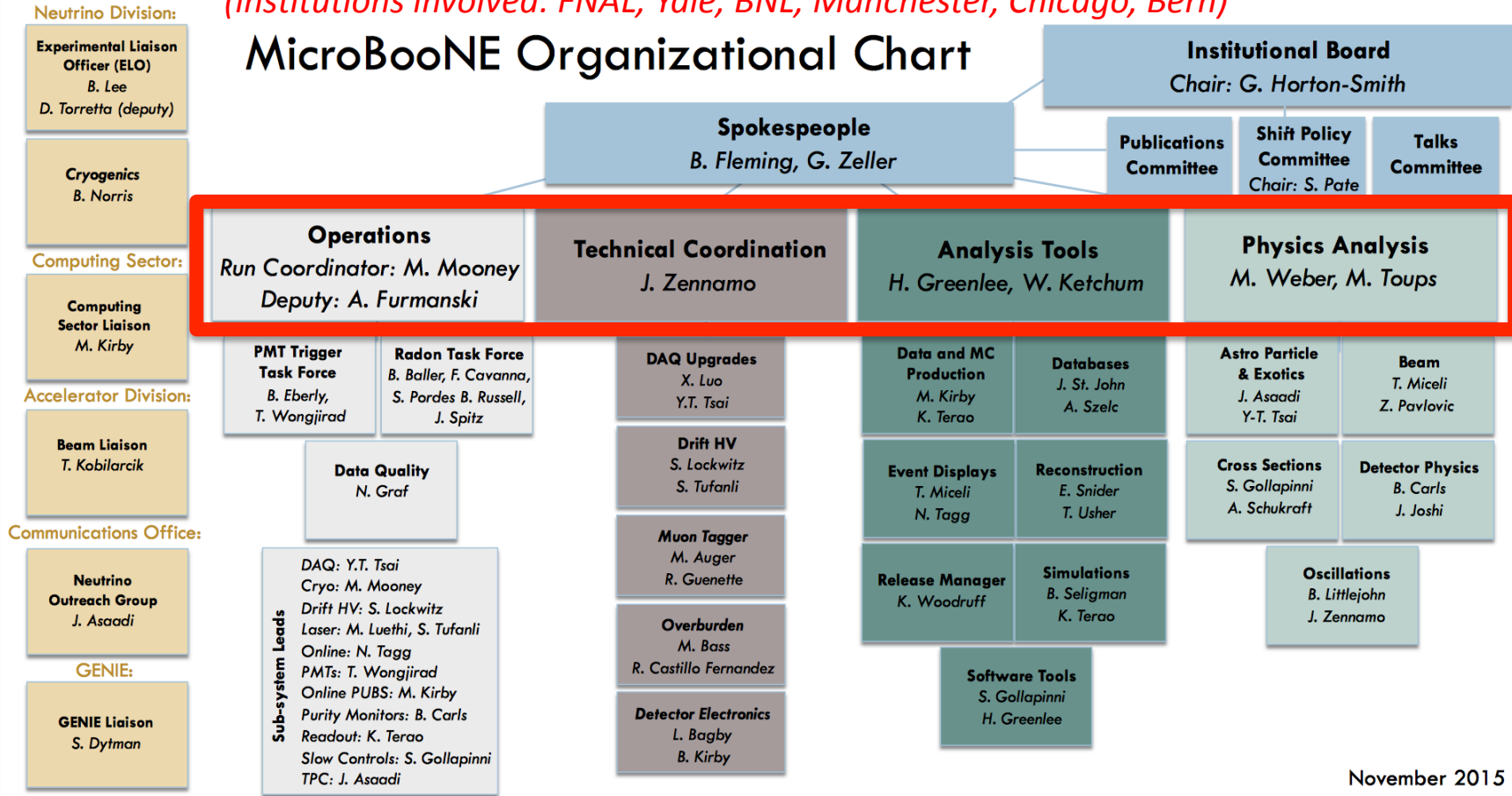


November 2015

Organization

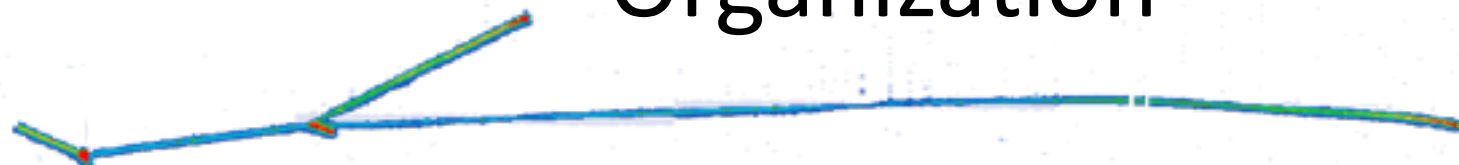
- senior management team meets every week with spokes (institutions involved: FNAL, Yale, BNL, Manchester, Chicago, Bern)

MicroBooNE Organizational Chart



November 2015

Organization



connections to organizations outside of MicroBooNE

Neutrino Division:

Experimental Liaison Officer (ELO)
B. Lee
D. Torretta (deputy)

Cryogenics
B. Norris

Computing Sector:

Computing Sector Liaison
M. Kirby

Accelerator Division:

Beam Liaison
T. Kobilarcik

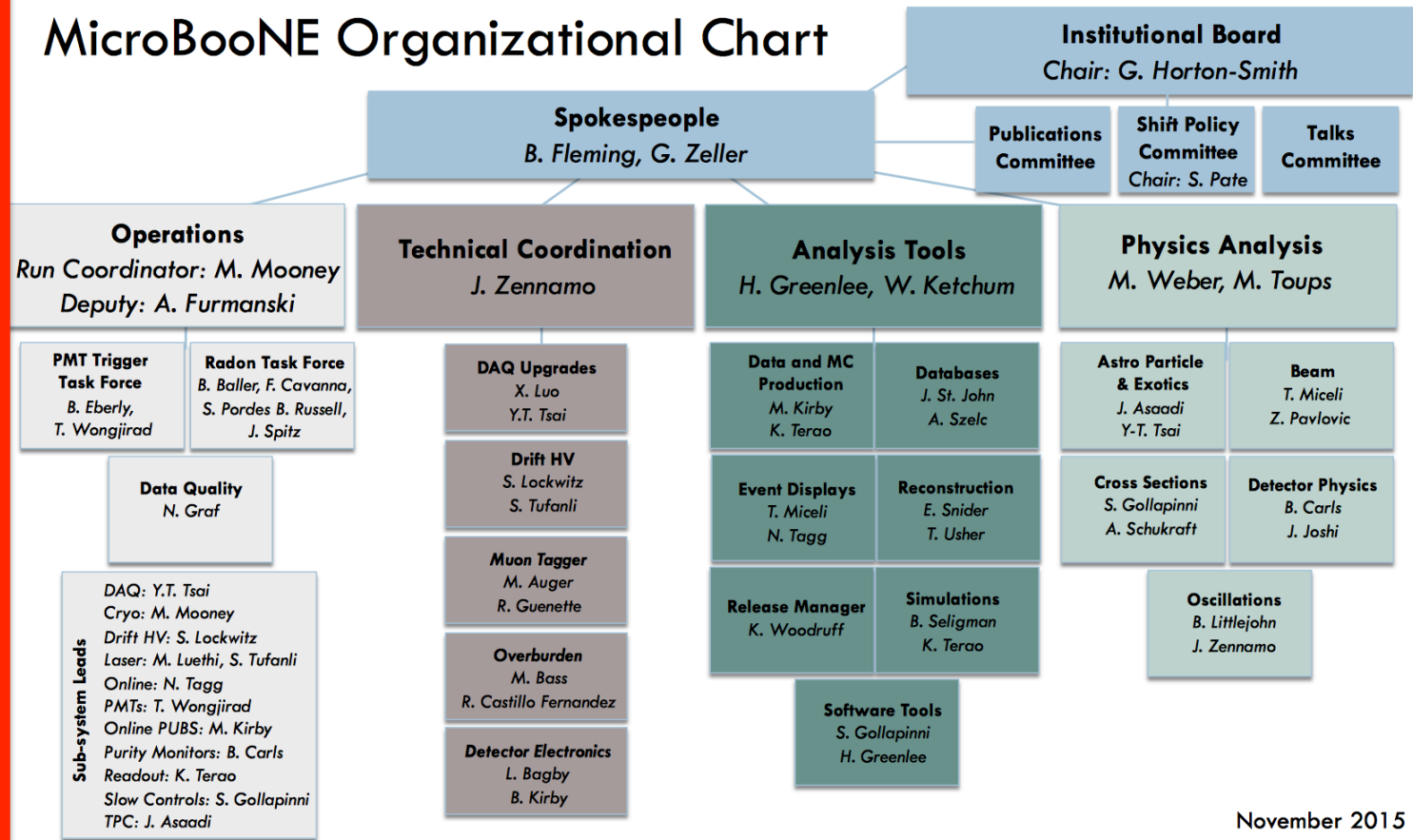
Communications Offices:

Neutrino Outreach Group
J. Asaadi

GENIE:

GENIE Liaison
S. Dytman

MicroBooNE Organizational Chart



November 2015

Lab Roles/Agreements

- Neutrino Division

- *cost to run MicroBooNE: ~\$220k/year in M&S which includes consumables (LN₂, Ar) and maintenance of MicroBooNE cryogenics system*
- *office space, support of Fermilab scientists and postdocs on MicroBooNE*
- *technical support (ELO, μ B cryogenic engineers, electrical engineers, Run Control)*

- Particle Physics Division

- *24/7 cryo ops team, technicians, management of LArTF*

- Accelerator Division

- *primary proton beam, horn replacement*

- Computing Sector (see TSW) (Ketchum and Greenlee talks)

- *DAQ, SLAM team, OPOS, ECL, scientific software (LArSoft, GENIE, GEANT4), ...*

Lab Roles/Agreements

- we are a new experiment to come online running a new detector in a new building → there are several areas where we need to coordinate with multiple FNAL Divisions to safely/successfully operate μ BooNE
- MicroBooNE cryogenic system
 - PPD: cryo technicians who monitor the μ B cryogenics system 24/7
 - ND: cryogenic engineers who are experts on the μ B system
- LArTF
 - ND: facility coordinator (ELO)
 - PPD: building manager
 - FESS: utilities & operations in LArTF
 - ESH&Q: DSO
- μ B shifters are the 3rd line of defense for both of these
- Run Coordinator, Deputy Run Coordinator, and Spokes met with each of these groups to discuss failure modes, clarify communication chain

Summary



- we have a very strong and enthusiastic collaboration (140 physicists from 28 institutions), roughly $\frac{1}{2}$ of which are students and postdocs who land well when they move on to their next jobs

- this is the next generation of LAr TPC experts who will be driving SBN & DUNE physics

- well-established analysis groups have been active and meeting regularly for the past 2.5 years



- we place a high value on safety and have worked together with multiple Fermilab Divisions to ensure safe operations of our building and cryogenics system

Backup Slides



New Collaborators



Nov 2015:

- Jose Crespo, Columbia, postdoc
- Marco Del Tutto, Oxford, graduate student
- Joris Jan de Vries, Cambridge, graduate student
- Libo Jiang, Pittsburgh, postdoc
- Bugra Kocaman, Tubitak, graduate student
- Mehmet Kopru, Tubitak, graduate student
- Ann Laube, Oxford, graduate student
- Xiao Luo, Yale, postdoc
- Joel Mousseau, Michigan, postdoc
- Davide Porzio, Manchester, graduate student
- James Sinclair, Bern, postdoc
- Roberto Soleti, Oxford graduate student
- Jack Weston, Cambridge, graduate student

Oct 2015:

- Raquel Castillo Fernandez, Fermilab, postdoc
- Davio Cianci, Manchester, graduate student
- Colton Hill, Manchester, graduate student
- Adam Lister, Lancaster, graduate student
- David Lorca, Bern, postdoc

Sept 2015:

- Danny Devitt, Lancaster University, graduate student
- Vic Genty, Columbia University, graduate student
- Varuna Meddage, Kansas State University, graduate student
- Aleena Rafique, Kansas State University, graduate student
- Shruti Shrestha, Kansas State University, postdoc
- Erica Snider, Fermilab
- Serhan Tufiani, Yale, postdoc

- 25 new people have joined MicroBooNE over the past 3 months
 - 15 grad students
 - 9 postdocs
 - 2 senior scientists