



Introduction

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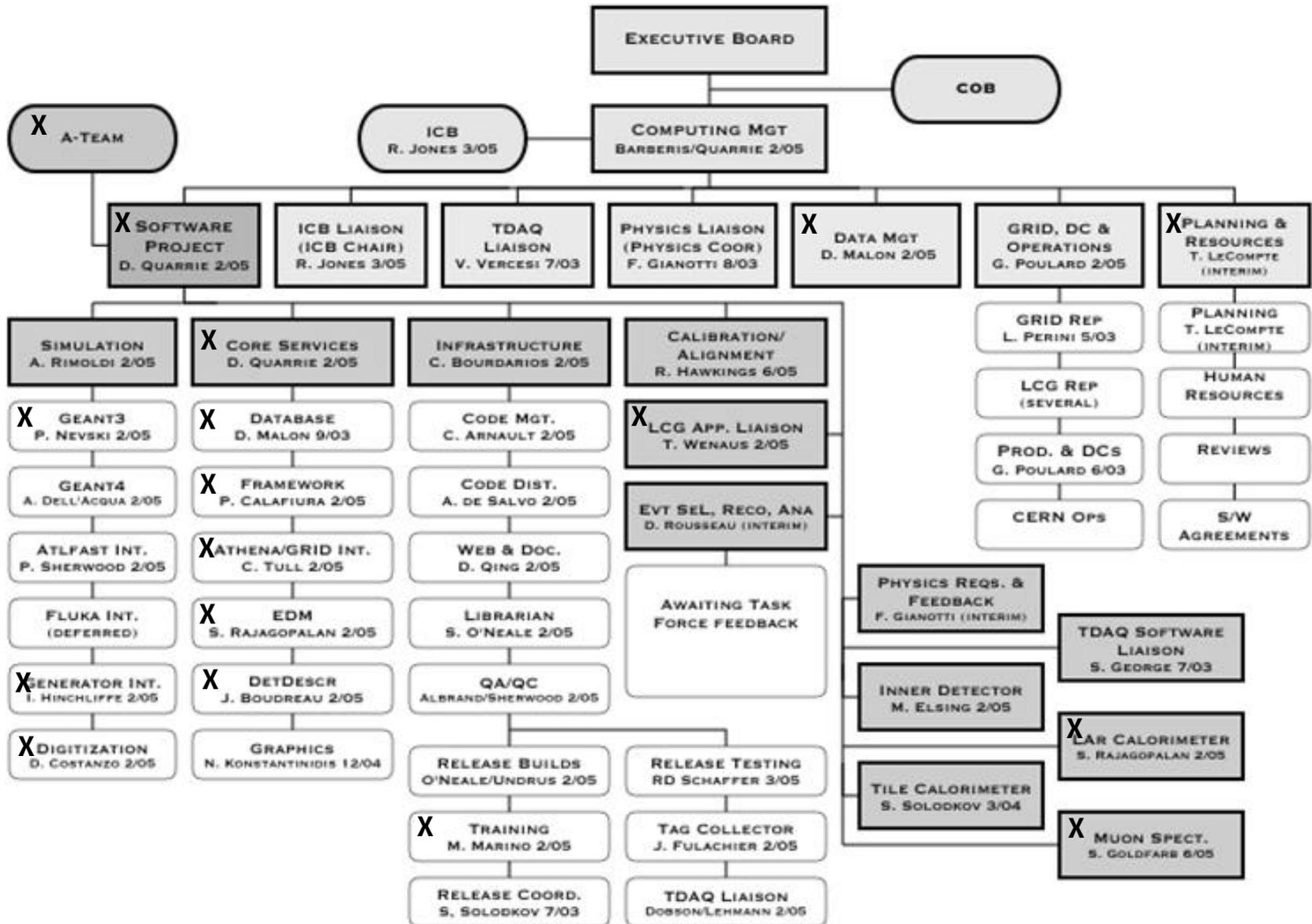
US ATLAS Computing Meeting

Outline



- ❄ Organizational Issues
 - ❑ ATLAS & U.S. ATLAS software
- ❄ Main areas of U.S. Software participation
 - ❑ Current priorities
- ❄ Analysis & Support
- ❄ Conclusion
 - ❑ US participation

New Computing Organization



Computing Management Board



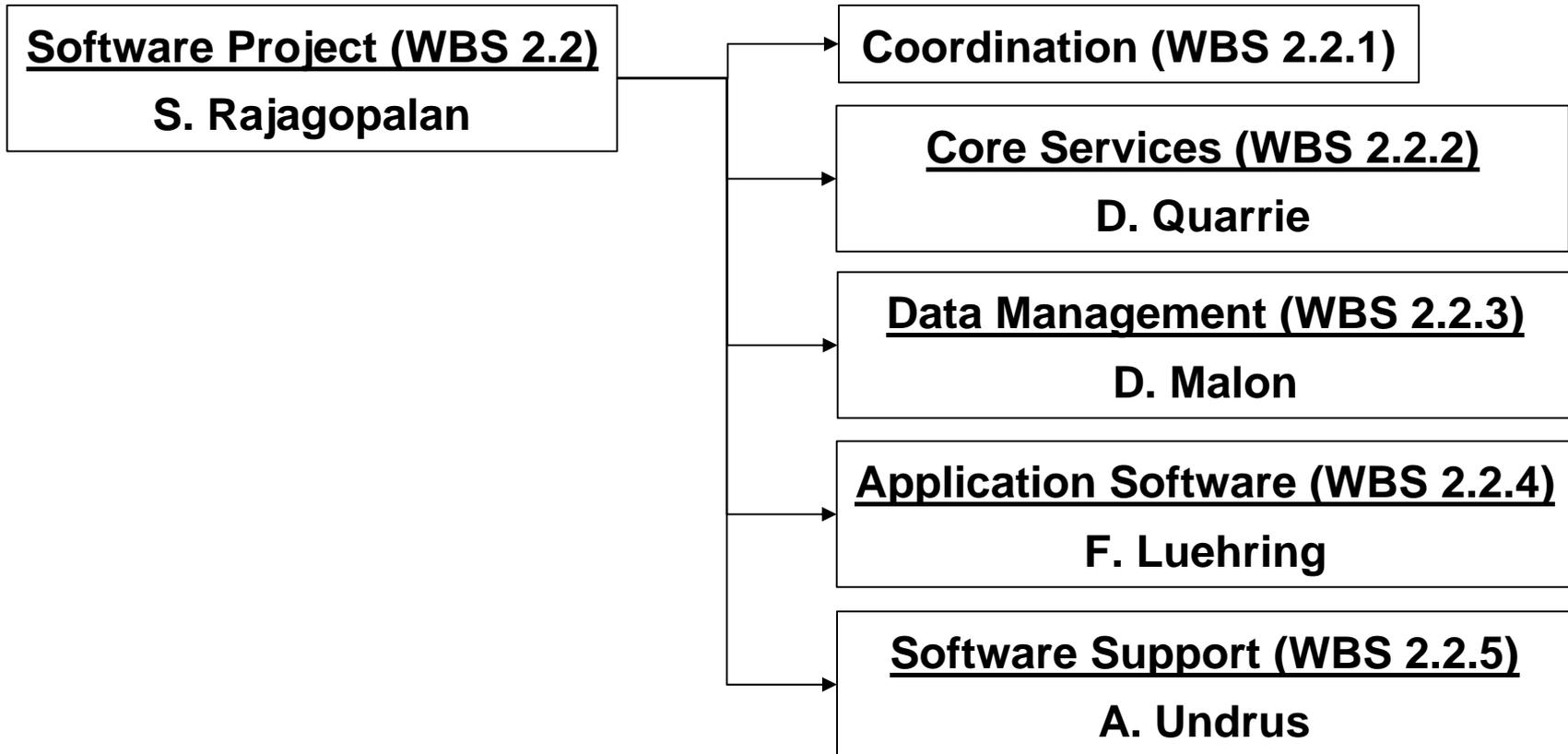
- ❄ **Coordinate & Manage computing activities**
 - ❑ Set priorities and take executive decisions
- ❄ **Computing Coordinator (chair)**
 - ❑ Software Project Leader (D. Quarrie, LBNL)
 - ❑ TDAQ Liaison
 - ❑ Physics Coordinator
 - ❑ International Computing Board Chair
 - ❑ GRID, Data Challenge and Operations Coordinator
 - ❑ Planning & Resources Coordinator (T. Lecompte, ANL)
 - ❑ Data Management Coordinator (D. Malon, ANL)
- ❄ **Meets bi-weekly**

Software Project Management Board



- ❄ Coordinate the coherent development of software
 - ❑ (core, applications and software support)
- ❄ Software Project Leader (chair) D. Quarrie
 - ❑ Simulation coordinator
 - ❑ Event Selection, Reconstruction & Analysis Tools coordinator
 - ❑ Core Services Coordinator (D. Quarrie)
 - ❑ Software Infrastructure Team Coordinator
 - ❑ LCG Applications Liaison (T. Wenaus, BNL)
 - ❑ Physics Liaison
 - ❑ TDAQ Liaison
 - ❑ Sub-System: Inner Detector, Liquid Argon, Tile, Muon coordinators
 - ⌘ Liquid Argon: S. Rajagopalan (BNL), Muon: S. Goldfarb (U Mich)
- ❄ Meets bi-weekly

US ATLAS Software Organization



- US ATLAS software WBS scrubbed, consistent with ATLAS
 - Resource Loading and Reporting established at Level 4
- Major change compared to previous WBS:
 - Production and Grid Tools & Services moved under Facilities

Framework



❄ People involved:

- ❑ P. Calafiura, W. Lavrijsen, C. Leggett, M. Marino, D. Quarrie, C. Tull
- ❑ S. Rajagopalan, H. Ma, J. Boudreau

❄ Scope:

- ❑ Framework support, Event Merging (pile-up)
- ❑ SEAL plug-in and component support
- ❑ Event Data Model Infrastructure
- ❑ User interfaces, Python scripting, binding to dictionary, integration with GANGA.
- ❑ Detector Description & Conditions infrastructure.
- ❑ Athena Grid Integration



❄ People involved:

- ❑ D. Malon, K. Karr, S. Vanyachine
- ❑ D. Adams, W. Deng, V. Fine, V. Perevotchikov

❄ ATLAS specific contributions:

- ❑ Athena-Pool integration to support data persistency
- ❑ Support for NOVA database
 - ⌘ (primary source for detector description for simulation)

❄ LCG contributions

- ❑ POOL collections/metadata work package interface
- ❑ Support for Foreign object persistence
- ❑ Detailed review of the LCG POOL design in context of ATLAS requirements

Application Software



- ❄ **Geant3 simulation support**
BNL
- ❄ **Calorimeter (LAr & Tile) software incl. calibration**
ANL, BNL, Nevis Labs, U. Arizona, U. Chicago, U. Pittsburgh, SMU
- ❄ **Pixel, TRT detector simulation & digitization**
Indiana U., LBNL
- ❄ **Muon reconstruction and database**
BNL, Boston U., LBNL, U. Michigan
- ❄ **Hadronic calibration, tau and jet reconstruction**
U. Arizona, U. Chicago, ANL, BNL, LBNL
- ❄ **electron-gamma reconstruction**
BNL, Nevis Labs, SMU
- ❄ **High Level Trigger software**
U. Wisconsin
- ❄ **Physics analysis with new software**
U. S. ATLAS

Software Support



- ❄ Full software support and maintenance at BNL (A. Undrus)
 - ❑ Release and maintenance of ATLAS and all associated external software (including LCG software, LHCb Gaudi builds) at the Tier 1 Facility.
 - ⌘ Typical ATLAS releases once every 3 weeks
 - ❑ Deployment of a nightly build system at BNL, CERN and now used by LCG as well.
 - ❑ ATLAS Software Infrastructure Team : Forum for discussions of issues related to support of ATLAS software and associated tools. A. Undrus is a member of this body.

LCG Application Component



- * T. Wenaus (BNL) serves as the LCG Applications Area coordinator
- * US effort in SEAL : 1.0 FTE (FY03)
 - Plug-in manager (M. Marino (0.75 FTE, LBNL)
 - ⌘ Internal use by POOL now, Full integration into Athena Q3 2003
 - Scripting Services (W. Lavjrisen; 0.25 FTE, LBNL)
 - ⌘ Python support and integration
- * US effort in POOL : 1.2 FTE (FY03)
 - Principal responsibility in POOL collections and metadata WP
 - ⌘ D. Malon, K. Karr, S. Vanyachine (0.5 FTE) [ANL]
 - POOL Datasets (D. Adams, 0.2 FTE, BNL)
 - Common Data Management Software
 - ⌘ V. Perevoztchikov, ROOT I/O foreign object persistence (0.3 FTE, BNL]
 - POOL mysql package and server configurations (ANL, 0.2 FTE)

US ATLAS contribution in LCG



- **Contribution to Application Area only**
 - **Limited contributions from ATLAS**
- **Snapshot (June 2003) contribution**

	People	FTE	US People	US FTE
Total LCG hires	22	21.35		
Working directly for apps area projects	17	16.55		
ROOT	2	2		
Grid integration work with experiments	3	2.8		
Apps area project contributions from				
IT	4	3.3		
EP/SFT not experiment specific	20	17.1		
EP/SFT experiment specific	7	4.45	1	0.75
Experiments outside EP/SFT	28	11.9	10	2.7
Total directly working on apps area projects	76	53.3	11	3.45
Overall applications area total	81	58.1	11	3.45

Major near term milestones



- * July to Dec 2003: SEAL/POOL/PI deployment by LCG
- * Sept. 2003: Geant 4 based simulation release
- * Dec. 2003: Validate Geant4 release for DC2 and test-beam
- * Dec. 2003: First release of full ATLAS software chain using LCG components and Geant4 for use in DC2 and combined test-beam.
- * Spring 2004: Combined Test-Beam runs.
- * Spring 2004: Data Challenge 2
 - Principal means by which ATLAS will test and validate its proposed Computing Model
- * Dec. 2004: Computing Model Document released

Detector Description



- ❄ ATLAS lacked a Detector Description Model
 - ❑ Numbers hardwired in reconstruction, no commonality with simulation.
- ❄ Along came Joe Boudreau (U. Pittsburgh) CDF experience
 - ❑ Successfully designed, developed and deployed a prototype model for both material and readout geometry. We encouraged this!
 - ⌘ Automatically handles alignments, Optimized for memory (5 MB for describing ATLAS geometry), Not coupled to visualization software.
 - ❑ Critical items include Material Integration Service, Configuration Utility, Identifiers and Transient Model for readout geometry
- ❄ Recognizing it is important to support such university based contributions and the critical needs of Detector Description, we have decided to allocate 1 FTE to Pittsburgh in 2004

Analysis and Support



❄ Updated Web-Site at US ATLAS:

- ❑ http://www.usatlas.bnl.gov/atlas_psc

❄ Documentation of use of Tier1 Facility, Software and Physics has been updated.

❄ In particular, we have established a guide to physics analysis in U.S. ATLAS

- ❑ User Guides to Generators, Simulation, Trigger, Reconstruction and use of analysis tools.
- ❑ Concrete realistic examples for each components.

❄ Hands-on Tutorials

Conclusion



❄ 34 institutes in U.S. ATLAS

- ❑ 20 are participating in some aspect of software
 - ⌘ Core software, Reconstruction & Simulation, Trigger, Analysis, Production, Grid.

- ❑ We have not heard from the other 14 institutes:
 - ⌘ SUNY Albany, Brandeis, Duke, Hampton, Iowa State, UC Irvine, MIT, Ohio State, U. Pennsylvania, U. Rochester, UC Santa Cruz, TUFTS, U. Illinois, U. Washington.

Conclusion (2)



- ❄ Now is the best time to get involved in software development and physics analysis.
 - ❑ Full chain of simulation & reconstruction exists, but much work needs to be done to achieve perfection.
 - ❑ Subsequent talks: try to expose areas where US is primarily participating and where you can possibly contribute.

- ❄ These US ATLAS workshops are primarily meant to encourage your participation.

- ❄ What can we do to help you get involved?
 - ❑ Documentation & Tutorials by themselves are not sufficient
 - ❑ one on one help would work better
 - ❑ But we need you to put take the first step.