Advisory Mechanisms

SCAP | SAC | IOFG
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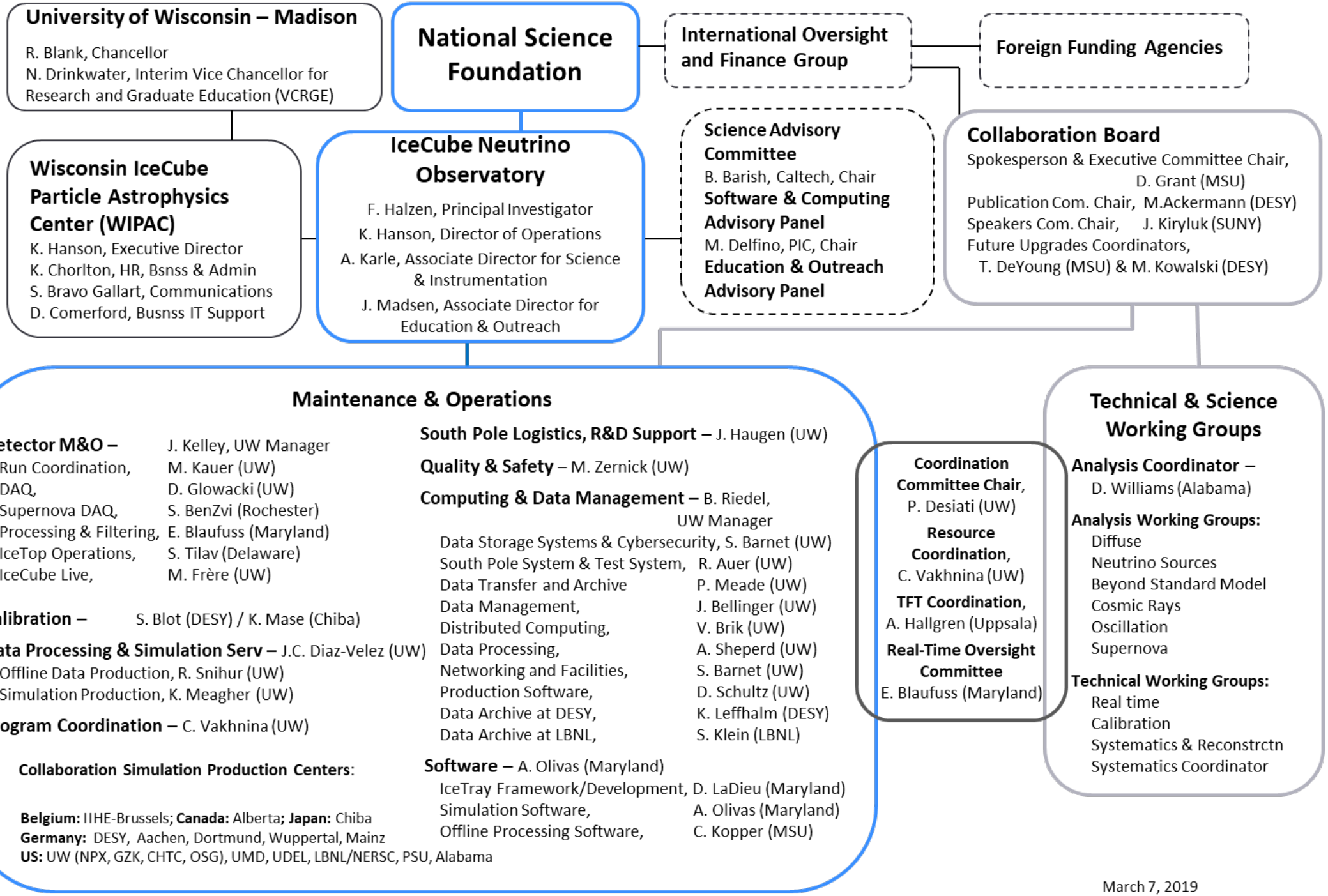
University of Wisconsin – Madison
IceCube M&O Review Mar 11, 2019

Overview

- IceCube M&O benefits from advisory structures established during the construction phase.
- Over a decade ago when structures for IceCube operations were being formulated, the need was recognized to establish advisory bodies to provide oversight, guidance, and support in the following areas:
  - Computing, including software, hardware, and distributed data processing,
  - Science mission of IceCube,
  - Oversight and coordination of inter-agency plans and funding.


University of Wisconsin – Madison
R. Blank, Chancellor
N. Drinkwater, Interim Vice Chancellor for Research and Graduate Education (VCRGE)
National Science Foundation
International Oversight and Finance Group
Foreign Funding Agencies
Wisconsin IceCube Particle Astrophysics Center (WIPAC)
K. Hanson, Executive Director
K. Chorlton, HR, Bsnss & Admin
S. Bravo Gallart, Communications
D. Comerford, Busnss IT Support
IceCube Neutrino Observatory
F. Halzen, Principal Investigator
K. Hanson, Director of Operations
A. Karle, Associate Director for Science & Instrumentation
J. Madsen, Associate Director for Education & Outreach
Science Advisory Committee
B. Barish, Caltech, Chair
Software & Computing Advisory Panel
M. Delfino, PIC, Chair
Education & Outreach Advisory Panel
Collaboration Board
Spokesperson & Executive Committee Chair, D. Grant (MSU)
Publication Com. Chair, M.Ackermann (DESY)
Speakers Com. Chair, J. Kiryluk (SUNY)
Future Upgrades Coordinators, T. DeYoung (MSU) & M. Kowalski (DESY)
Maintenance & Operations
Detector M&O – J. Kelley, UW Manager
Run Coordination, M. Kauer (UW)
DAQ, D. Glowacki (UW)
Supernova DAQ, S. BenZvi (Rochester)
Processing & Filtering, E. Blaufuss (Maryland)
IceTop Operations, S. Tilav (Delaware)
IceCube Live, M. Frère (UW)
Calibration – S. Blot (DESY) / K. Mase (Chiba)
Data Processing & Simulation Serv – J.C. Diaz-Velez (UW)
Offline Data Production, R. Snihur (UW)
Simulation Production, K. Meagher (UW)
Program Coordination – C. Vakhnina (UW)
Collaboration Simulation Production Centers:
Belgium: IIHE-Brussels; Canada: Alberta; Japan: Chiba
Germany: DESY, Aachen, Dortmund, Wuppertal, Mainz
US: UW (NPX, GZK, CHTC, OSG), UMD, UDEL, LBNL/NERSC, PSU, Alabama
South Pole Logistics, R&D Support – J. Haugen (UW)
Quality & Safety – M. Zernick (UW)
Computing & Data Management – B. Riedel, UW Manager
Data Storage Systems & Cybersecurity, S. Barnet (UW)
South Pole System & Test System, R. Auer (UW)
Data Transfer and Archive P. Meade (UW)
Data Management, J. Bellinger (UW)
Distributed Computing, V. Brik (UW)
Data Processing, A. Sheperd (UW)
Networking and Facilities, S. Barnet (UW)
Production Software, D. Schultz (UW)
Data Archive at DESY, K. Leffhalm (DESY)
Data Archive at LBNL, S. Klein (LBNL)
Software – A. Olivas (Maryland)
IceTray Framework/Development, D. LaDieu (Maryland)
Simulation Software, A. Olivas (Maryland)
Offline Processing Software, C. Kopper (MSU)
Coordination Committee Chair, P. Desiati (UW)
Resource Coordination, C. Vakhnina (UW)
TFT Coordination, A. Hallgren (Uppsala)
Real-Time Oversight Committee
E. Blaufuss (Maryland)
Technical & Science Working Groups
Analysis Coordinator – D. Williams (Alabama)
Analysis Working Groups:
Diffuse
Neutrino Sources
Beyond Standard Model
Cosmic Rays
Oscillation
Supernova
Technical Working Groups:
Real time
Calibration
Systematics & Reconstrctn
Systematics Coordinator

March 7, 2019

SCAP

Software and Computing Advisory Panel

History

- Evolution of IceCube MREFC Project Advisory Panel (one PAP member, LB, still active SCAP member) as the construction project shifted focus to operations.
- Members are experts in fields of software and/or scientific computing in particular distributed computing.
- Recognized early on that software and computing would be key challenges in operations phase – SCAP advises IceCube Spokesperson and Director of Operations on:
  - Online computing
  - Online and offline data processing
  - Offline computing facilities
  - Simulation and analysis support
- The SCAP has met 6 times since beginning of operations 2008.

Members

- Manuel Delfino (chair, former Director of PIC, Barcelona)
- Lothar Bauerdick (FNAL)
- Sridhara Dasu (UW, CMS)
- Miron Livny (UW, OSG, ex-officio)
- Peter Couvares (U Syracuse, LIGO)

2018 SCAP - Charge

1. Review on the effectiveness of M&O teams to deliver software and computing services to the collaboration based on the priorities established with science working groups.
2. Evaluate our new procedures to establish an internal policy of science result reproducibility and on public data release.
3. Evaluate our expansion of computing capabilities to reach IceCube science goals.

Summary of SCAP Comments

Full report in ‘Other Supplementary Documentation’ subdirectory

Charge 1

- SCAP commended M&O on …
  - Development of middleware to access collaboration computing services.
  - Realizing limited FTE in core software, for prioritizing issues and focusing development effort here.
- Concern that lack of overall computing manager led to sub-optimal coordination. In particular the 'architectural' view instead of technical view resulted in difficulties to develop common threads across sub-domains of IceCube computing.
- Recommendation: re-organize management and coordination OBS and appoint 'Global Computing Coordinator' to oversee computing facilities and software *and* interface directly with IceCube Analysis Coordinator.

Charge 3

- SCAP commended M&O on …
  - First steps toward harnessing massive computing resources such as OSG, XSEDE, and supercomputers such as TITAN.
  - Adapting distributed computing middleware to these environments
- Concerns include self-reported projections that computational needs of collaboration will outstrip projected resources.
- Recommendation: pursue research computing resources (OSG, XSEDE, supercomputers) to achieve within 18 months 10x higher computing power. Tall order, but, as described in B. Riedel's computing presentation, M&O is aggressively pursuing opportunities to achieve this goal.

SAC

Science Advisory Committee

General

- Began 2006 when first operations proposal was being drafted to provide advice to the Collaboration and management on scientific and data analysis program.
- Meets on 'ad hoc' basis to advise on scientific goals but has met annually with exception of 2014 and 2018 since 2006.
- SAC 2017 (agenda and report in 'Other Supplementary Documentation' subdirectory) focus primarily on crisping the science justification for the IceCube Upgrade Proposal and framing the case for future Gen2 facility in context of multiple years of astrophysical neutrino observation.

Members

- Barry Barish (Chair, Caltech – LIGO)
- Lothar Bauerdick (FNAL)
- Roger Blandford (SLAC)
- Edward Kolb (U Chicago)
- Karol Lang (UT Austin)
- Steve Ritz (UC Santa Cruz)
- Hank Sobel (UC Irvine)
- Jenny Thomas (UC London)
- Dave Wark (Oxford / STFC)
- Jim Yeck (UW – Madison)


IOFG
International

General

- Created in 2004 to provide oversight and financial coordination among the international funding agencies that supported the IceCube MREFC: USA, Germany, Sweden, Belgium.
- Meets annually briefed by Collaboration Spokesperson, Director of Operations, Principal Investigator, and others as appropriate.
- Role has changed as IceCube transitioned from construction to operations. Review of and decisions rendered on:
  - Common Fund payments and expenditures,
  - Review of MoU scope of work between ICNO and collaborating institutions,
  - Concurrence on M&O Plans,
  - Funding issues and coordination,
  - Future facility expansion planning and coordination.
- Formal membership remains – representatives of funding agencies that contributed substantially to IceCube construction.
- In recent years, representatives from agencies post-construction have been invited to participate to facilitate coordination in particular for future construction projects.

Members

- Jorgen d'Hondt (FWO – Belgium)
- Laurent Favart (FNRS – Belgium)
- Marc Hempel (BMBF – Germany)
- Christian Stegman (DESY – Germany)
- Catarina Sahlberg (CR – Sweden)
- Vladimir Papitashvili (NSF)
- Jim Whitmore (NSF)

Summary

- Advisory and oversight mechanisms, evolved from construction, remain important throughout operations phase of ICNO.
- SCAP, SAC, and IOFG continue to act as advisory mechanisms for the IceCube Upgrade
  - To provide technical and scientific guidance as the operations profile grows and as the science evolves,
  - To provide oversight and coordinate funding between agencies.