



# WBS and Reporting Structures of the U.S. and In-Kind Contributions

*Kael Hanson / Catherine Vakhnina*

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# Overview

- To be added



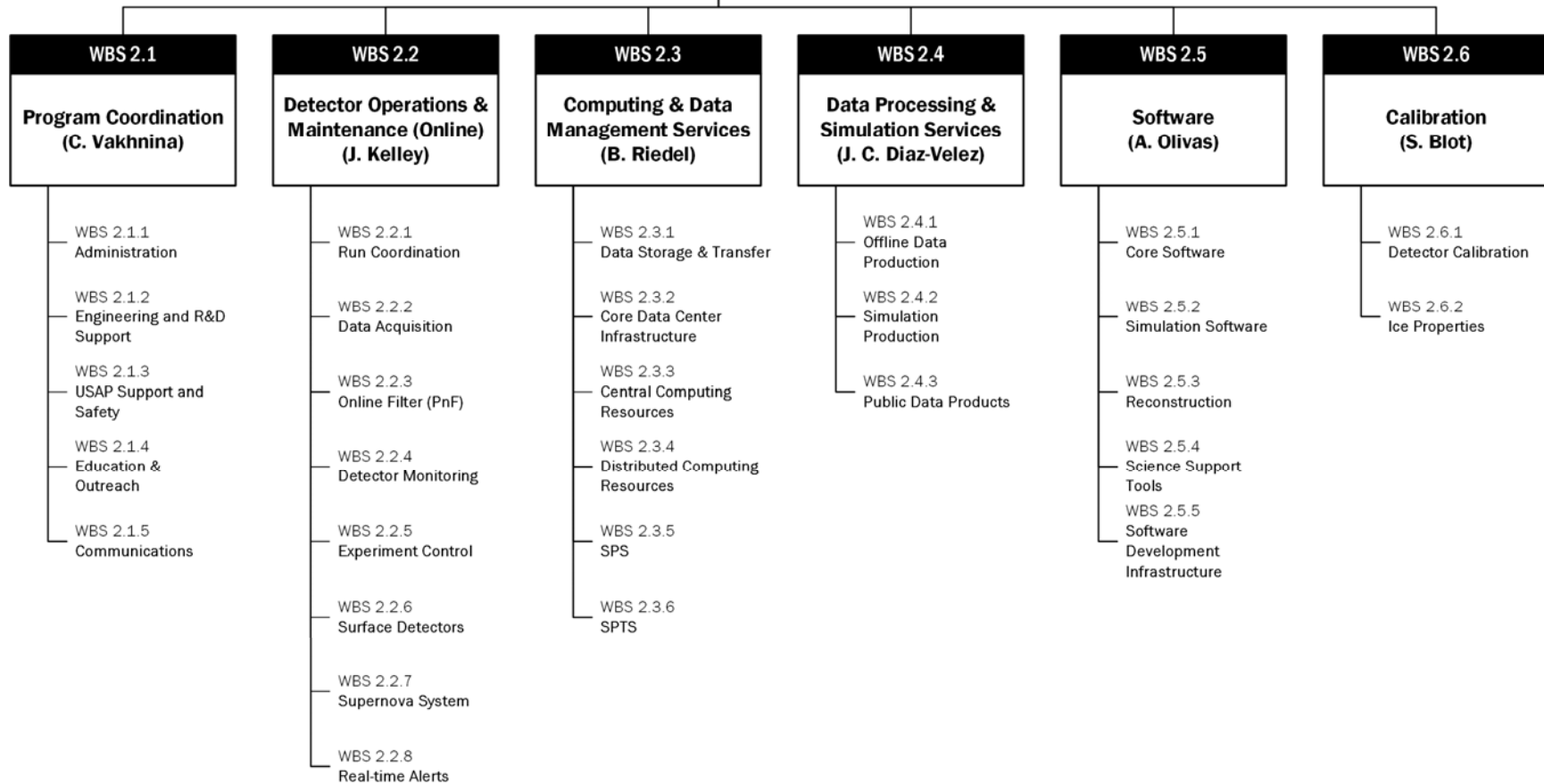
# IceCube Neutrino Observatory

F. Halzen – PI

K. Hanson – Director of Operations

A. Karle – Assoc Director for Science and Instrumentation

J. Madsen – Assoc. Director for Education and Outreach



# WBS Dictionary

IceCube Management and Operations

[WBS Dictionary](#)

Detailed IceCube M&O MoU Staffing Matrix  
by WBS and tasks

[IceCube M&O Staffing Matrix](#)

[Previous versions](#)



# FY2019 M&O Responsibilities (FTE)

## By WBS and Funds, v25.1 December 2018

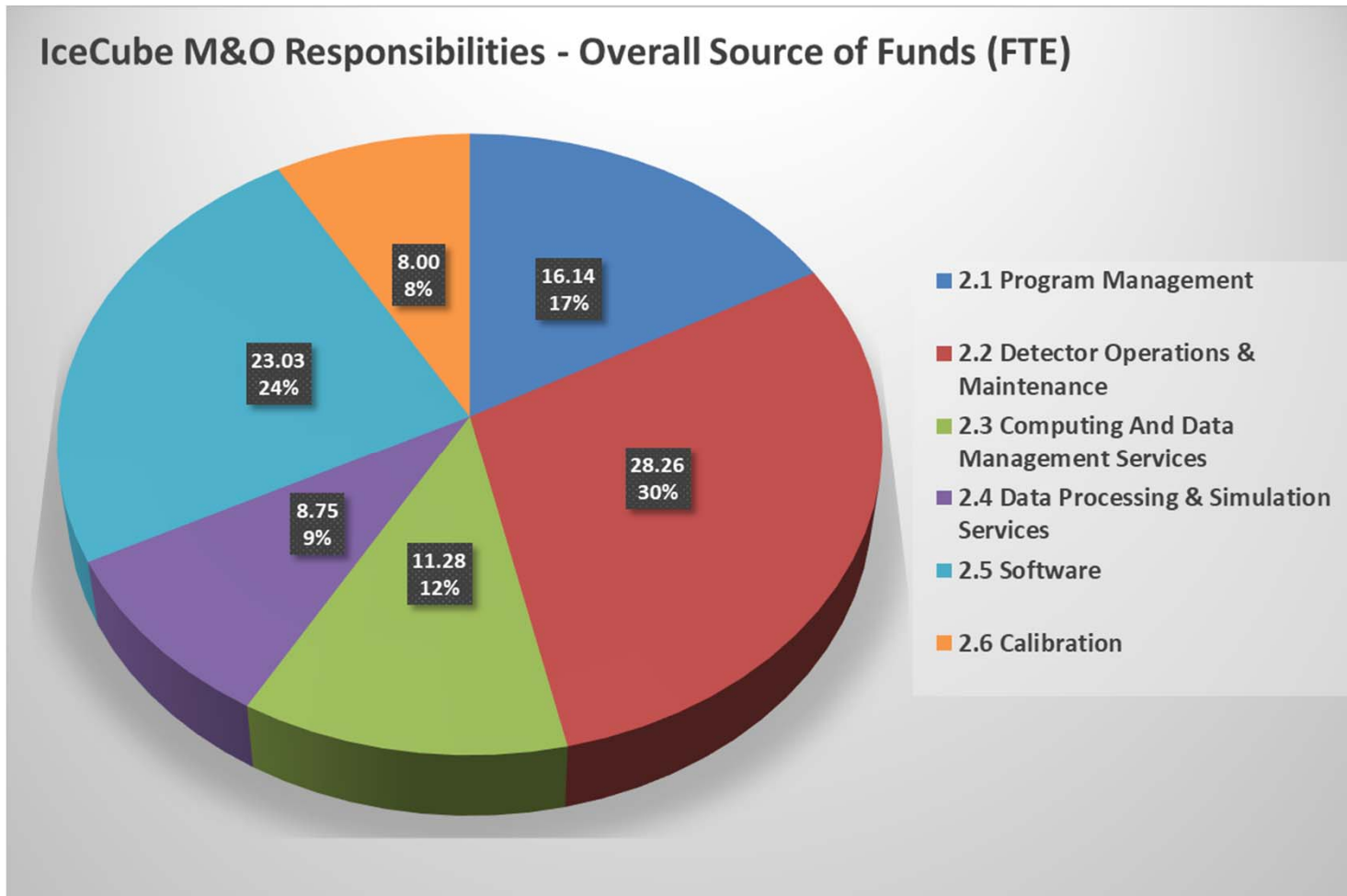
WBS L2	NSF M&O Core	NSF Base Grants	U.S. Institutional In-Kind	Europe & Asia Pacific In-Kind	Grand Total
2.1 Program Management	5.08	0.40	4.26	6.40	<b>16.14</b>
2.2 Detector Operations & Maintenance	13.48	1.98	3.75	9.05	<b>28.26</b>
2.3 Computing And Data Management Services	7.85	0.05	1.38	2.00	<b>11.28</b>
2.4 Data Processing & Simulation Services	3.50	0.95	1.05	3.25	<b>8.75</b>
2.5 Software	4.05	1.90	5.93	11.15	<b>23.03</b>
2.6 Calibration	1.05	1.30	1.75	3.90	<b>8.00</b>
<b>Grand Total</b>	<b>35.01</b>	<b>6.58</b>	<b>18.12</b>	<b>35.75</b>	<b>95.46</b>

IceCube M&O MoU's are posted at:

DocuShare: <https://docushare.icecube.wisc.edu/dsweb/View/Collection-6627>



# FY2019 IceCube M&O Responsibilities



# FY2019 M&O Responsibilities By WBS and Funds, v25.1 December 2018

## WBS 2.1 Program Management

WBS L2	WBS L3	NSF M&O Core	Base Grants	US In-Kind	Non-US In-kind	Grand Total
2.1 Program Management	2.1.1 Administration	2.7 FTE	0.2 FTE	2.4 FTE	4.3 FTE	<b>9.6 FTE</b>
	2.1.2 Engineering and R&D Support	1.1 FTE	0.3 FTE	0.8 FTE	0.9 FTE	<b>3.1 FTE</b>
	2.1.4 Education & Outreach	0.8 FTE		1.1 FTE	1.2 FTE	<b>3.1 FTE</b>
	2.1.3 Usap Support & Safety	0.2 FTE				<b>0.2 FTE</b>
	2.1.5 Communications	0.3 FTE				<b>0.3 FTE</b>
<b>2.1 Program Management Total</b>		<b>5.1 FTE</b>	<b>0.4 FTE</b>	<b>4.3 FTE</b>	<b>6.4 FTE</b>	<b>16.1 FTE</b>

Click here for detailed [IceCube M&O MoU Staffing Matrix by WBS v25.1 2018.1218](#)



# FY2019 M&O Responsibilities

## By WBS and Funds, v25.1 December 2018

### WBS 2.2 Detector Operations and Maintenance

WBS L2	WBS L3	NSF M&O Core	Base Grants	US In-Kind	Non-US In-kind	Grand Total
2.2 Detector Operations & Maintenance	2.2 Detector Operations & Maintenance	1.6 FTE			0.1 FTE	<b>1.7 FTE</b>
	2.2.1 Run Coordination	3.6 FTE				<b>3.6 FTE</b>
	2.2.2 Data Acquisition	3.2 FTE		0.5 FTE		<b>3.7 FTE</b>
	2.2.3 Online Filter (Pnf)	0.5 FTE	0.9 FTE	0.9 FTE	5.1 FTE	<b>7.3 FTE</b>
	2.2.4 Detector Monitoring	2.1 FTE	0.6 FTE	0.9 FTE	2.2 FTE	<b>5.8 FTE</b>
	2.2.5 Experiment Control	0.8 FTE				<b>0.8 FTE</b>
	2.2.6 Surface Detector Operations	1.6 FTE		0.8 FTE	1.1 FTE	<b>3.5 FTE</b>
	2.2.7 Supernova System			0.5 FTE		<b>0.5 FTE</b>
	2.2.8 Real-Time Alerts	0.3 FTE	0.5 FTE	0.3 FTE	0.6 FTE	<b>1.6 FTE</b>
<b>2.2 Detector Operations &amp; Maintenance Total</b>		<b>13.5 FTE</b>	<b>2.0 FTE</b>	<b>3.8 FTE</b>	<b>9.1 FTE</b>	<b>28.3 FTE</b>

Click here for detailed [IceCube M&O MoU Staffing Matrix by WBS v25.1 2018.1218](#)





# FY2019 M&O Responsibilities

## By WBS and Funds, v25.1 December 2018

### WBS 2.3 Computing & Data Management Services

WBS L2	WBS L3	NSF M&O Core	Base Grants	US In-Kind	Non-US In-kind	Grand Total
2.3 Computing And Data Management Services	2.3.0 Computing And Data Management	0.9 FTE		0.1 FTE		<b>1.0 FTE</b>
	2.3.1 Data Storage & Transfer	2.2 FTE				<b>2.2 FTE</b>
	2.3.2 Core Data Center Infrastructure	1.3 FTE				<b>1.3 FTE</b>
	2.3.3 Central Computing Resources	0.6 FTE		1.3 FTE	1.4 FTE	<b>3.3 FTE</b>
	2.3.4 Distributed Computing Resources	1.6 FTE	0.1 FTE		0.6 FTE	<b>2.3 FTE</b>
	2.3.5 Sps Operations	0.7 FTE				<b>0.7 FTE</b>
	2.3.6 Spts Operations	0.6 FTE				<b>0.6 FTE</b>
<b>2.3 Computing And Data Management Services Total</b>		<b>7.9 FTE</b>	<b>0.1 FTE</b>	<b>1.4 FTE</b>	<b>2.0 FTE</b>	<b>11.3 FTE</b>

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# FY2019 M&O Responsibilities

## By WBS and Funds, v25.1 December 2018

### WBS 2.4 Data Processing & Simulation Services

WBS L2	WBS L3	NSF M&O Core	Base Grants	US In-Kind	Non-US In-kind	Grand Total
2.4 Data Processing & Simulation Services	2.4.1 Offline Data Production	0.2 FTE	0.5 FTE	0.5 FTE	1.7 FTE	<b>2.8 FTE</b>
	2.4.2 Simulation Production	3.0 FTE	0.5 FTE	0.6 FTE	1.6 FTE	<b>5.7 FTE</b>
	2.4.3 Public Date Products	0.3 FTE				<b>0.3 FTE</b>
<b>2.4 Data Processing &amp; Simulation Services Total</b>		<b>3.5 FTE</b>	<b>1.0 FTE</b>	<b>1.1 FTE</b>	<b>3.3 FTE</b>	<b>8.8 FTE</b>

Click here for detailed [IceCube M&O MoU Staffing Matrix by WBS v25.1 2018.1218](#)



# FY2019 M&O Responsibilities By WBS and Funds, v25.1 December 2018

## WBS 2.5 Software

WBS L2	WBS L3	NSF M&O Core	Base Grants	US In-Kind	Non-US In-kind	Grand Total
2.5 Software	2.5.1 Core Software	1.7 FTE		1.1 FTE	1.1 FTE	<b>3.9 FTE</b>
	2.5.2 Simulation Software	1.1 FTE	0.5 FTE	1.1 FTE	2.4 FTE	<b>5.0 FTE</b>
	2.5.3 Reconstruction	0.6 FTE	1.5 FTE	3.4 FTE	7.3 FTE	<b>12.8 FTE</b>
	2.5.4 Science Support Tools			0.3 FTE		<b>0.3 FTE</b>
	2.5.5 Software Development Infrastructure	0.8 FTE				<b>0.8 FTE</b>
	2.6.2 Ice Properties				0.6 FTE	<b>0.6 FTE</b>
<b>2.5 Software Total</b>		<b>4.1 FTE</b>	<b>1.9 FTE</b>	<b>5.9 FTE</b>	<b>11.4 FTE</b>	<b>23.3 FTE</b>

Click here for detailed [IceCube M&O MoU Staffing Matrix by WBS v25.1 2018.1218](#)



# FY2019 M&O Responsibilities

## By WBS and Funds, v25.1 December 2018

### WBS 2.6 Calibration

WBS L2	WBS L3	NSF M&O Core	Base Grants	US In-Kind	Non-US In-kind	Grand Total
2.6 Calibration	2.5.3 Reconstruction				0.4 FTE	<b>0.4 FTE</b>
	2.6.1 Detector Calibration	1.1 FTE	0.6 FTE	0.9 FTE	2.9 FTE	<b>5.4 FTE</b>
	2.6.2 Ice Properties		0.8 FTE	0.9 FTE	0.4 FTE	<b>2.1 FTE</b>
<b>2.6 Calibration Total</b>		<b>1.1 FTE</b>	<b>1.3 FTE</b>	<b>1.8 FTE</b>	<b>3.7 FTE</b>	<b>7.8 FTE</b>

Click here for detailed [IceCube M&O MoU Staffing Matrix by WBS v25.1 2018.1218](#)

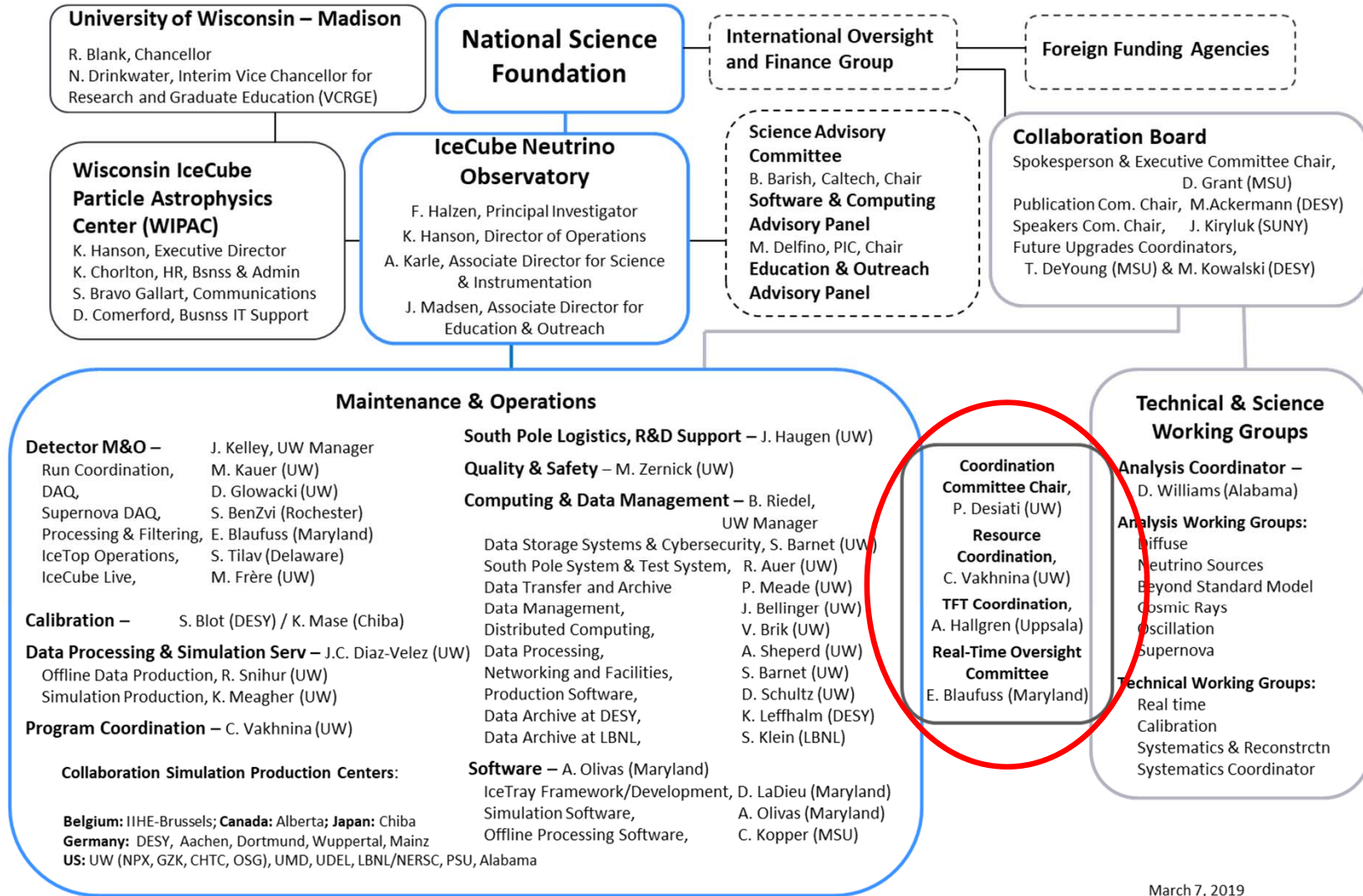


# FY2019 M&O Responsibilities

MoU v.25.1 January 2019	U.S. Head Count	U.S. FTE	Non-U.S. Head Count	Non-U.S. FTE
Key Personnel	34	9.95	33	9.10
Scientists	29	8.38	17	1.75
Post Docs		5.55		4.05
Grad Students *	40	11.18	62	19.86
Other Professionals **	28	24.65	1	1.00

- Grad Students' Full Time Employment equals to 0.50 FTE
- Other professionals include engineers, data science, software engineers, winterovers, program mngt





# Bridge Between Collaboration and M&O

- ICC manages scientific needs of collaboration:
  - High priority tasks assigned to in-kind labor from MoUs,
  - Software strike team
  - Coordination of passX
  - New re-org of WG technical leads to serve as PoC on ICC
- Coordinates in-kind resource pledges:
  - Labor → high priority tasks or software strike team
  - Distributed computing resources
- Maps needs to resources.



# Composition and Execution

- Membership – evolution of L2 Board in MREFC
  - ICC Chair – P. Desiati
  - M&O Resource Coordinator – C. Vakhnina
  - Each Level 2 coordinator
  - TFT Chair – A. Hallgren
  - ROC Chair – E. Blaufuss
  - Analysis Coordinator – D. Williams
  - Science Working Group Technical Leads
- Monthly teleconference Wed 9.00 am
- Bi-weekly teleconference Tue 10.30 am open for general technical discussion leading up to ICC.





# Summary

- IceCube M&O Program receives significant contributions of in-kind labor from the IceCube Collaboration, heavily in WBS 2.5 Software and 2.6 Calibration
- Also, significant in-kind contributions of Distributed Computing
- The Collaboration updates the Scope of Work and M&O Responsibilities in the MoU's twice a year.
- All resources are coordinated by IceCube Coordination Committee (ICC)

# Backup material

