

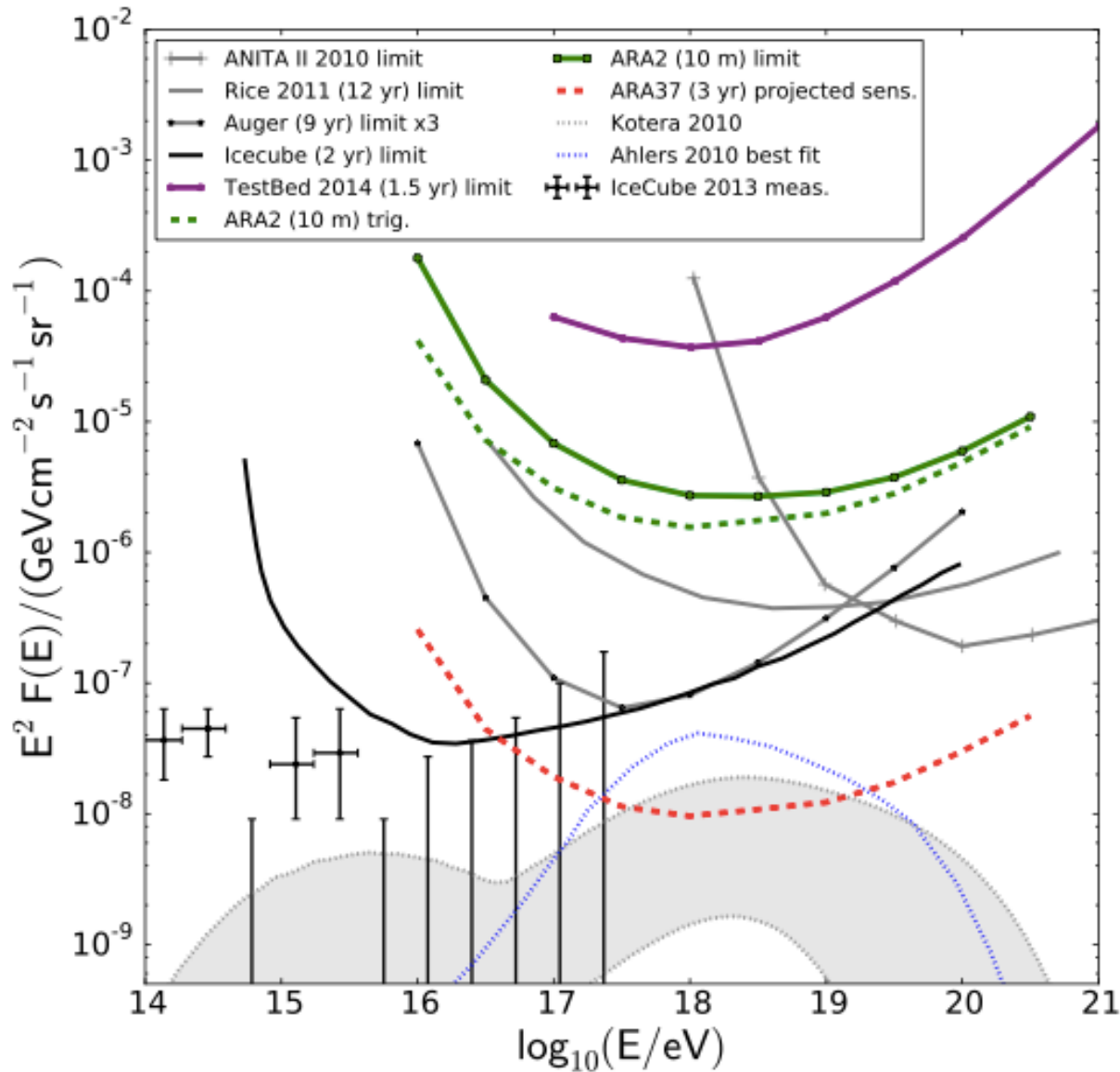
ARA

July 2015

Albrecht Karle

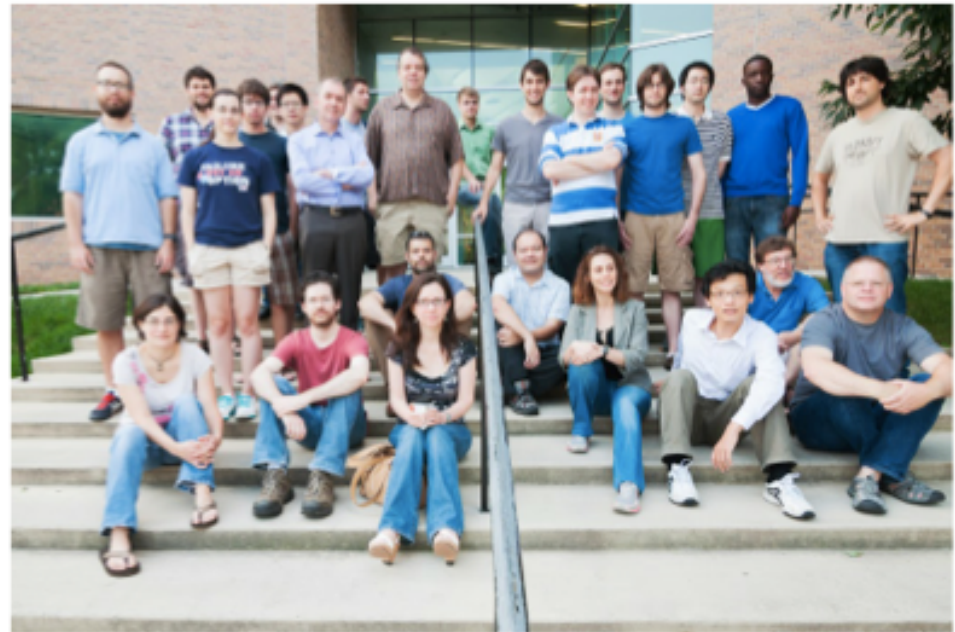
Used some of the following slides as
talking points during a visit to NSF a month ago.

Analysis progress



Collaboration in 2014

11 institutions across the globe



Collaboration, Non-US

- NTU, Taiwan:
 - very active, investing, built stations
- Chiba Univ., Japan:
 - Very active, funded, building antennas
- Weizmann Inst., Israel
 - Data analysis, operations, electronics boards to shift to new digitizer (DRS4)
- Brussels: out (Kael Hanson → UW)

Collaboration, US

- University of Chicago, Abby Viereggs
 - Very similar approaches of ARA and GNO in Greenland

NSF proposal status

Message to NSF:

- Deployment season in 2016/17 is highest priority
- Current budget approach is 'bare bones', sub critical for data analysis and development but will help to get through this phase and keep the collaboration together.

Scope (Revised budget impact statement):

- Integrate, test, deploy and commission 2 detector stations or more at the South Pole. Installation at the South Pole is scheduled for season 2016/17. The testing of electronics and assembled stations takes place primarily at KU, OSU, and UW in 2015/16. The production of specialized calibration instruments is done at UMD. The scope includes maintenance and operation of the deployed detectors and analysis of data from operating stations. Surface antennas were removed from ARA station design.

NSF proposal status

- Support at NSF from both, OPP and Physics. Both have approved to commit the funds mentioned. (Pretty sure we get some funding)
- Not clear: Deployment season in 16/17. Operations people (J. Crane) apparently have suggested 17/18 as alternative. Operational support review at NSF is not done yet. Expect answer by September.

Budget - original

Original Submission - 2013.10.30

Institution	YEAR1	YEAR2	YEAR3	Cum.	%	Comments
UW-Madison	\$671,205	\$601,790	\$193,771	\$1,466,766	42%	Including UNL
UMD	\$268,963	\$294,164	\$160,515	\$723,641	21%	
OSU	\$229,804	\$236,241	\$180,242	\$646,287	18%	
KU	\$153,414	\$159,023	\$83,191	\$395,628	11%	
UD	\$78,982	\$111,843	\$79,766	\$270,591	8%	
NSF TOTAL	\$1,402,367	\$1,403,060	\$697,486	\$3,502,913	100%	
NTU	\$298,520	\$368,750	\$0	\$667,270		
CHIBA	\$68,873	\$89,224	\$0	\$158,097		
ULB	\$24,660	\$26,825	\$0	\$51,485		
WIS	\$10,000	\$10,000	\$0	\$20,000		
Non U.S. Subtotal	\$402,053	\$494,799	\$0	\$896,852		
Total U.S. & Non U.S.	\$1,804,420	\$1,897,859	\$697,486	\$4,399,765		

Budget - resubmitted

Revised Proposal – June 2, 2015

Institution	YEAR1	YEAR2	YEAR3	Cum.	% of NSF Revised Proposal	Comments
UW-Madison	\$295,622	\$217,412	\$0	\$513,034	40%	Including UNL
UMD	\$154,347	\$84,516	\$0	\$238,862	19%	
OSU	\$140,819	\$138,830	\$0	\$279,649	22%	
KU	\$74,849	\$74,783	\$0	\$149,632	12%	
UD	\$42,561	\$43,686	\$0	\$86,247	7%	
NSF TOTAL	\$708,197	\$559,227	\$0	\$1,267,424	100%	
NTU	\$34,700	\$322,285	\$0	\$356,985		
CHIBA	\$300	\$91,862	\$0	\$92,162		
ULB	\$0	\$0	\$0	\$0		
WIS	\$2,500	\$2,500	\$0	\$5,000		
Non U.S. Subtotal	\$37,500	\$416,647	\$0	\$454,147		
Total U.S. & Non U.S.	\$745,697	\$975,874	\$0	\$1,721,571		

Total NSF funds request was decreased from \$3,503 k to **\$1,267 k**.

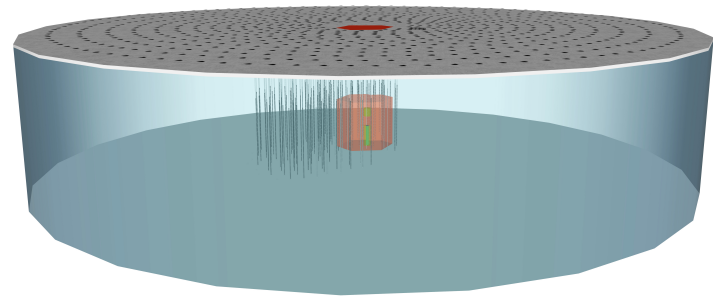
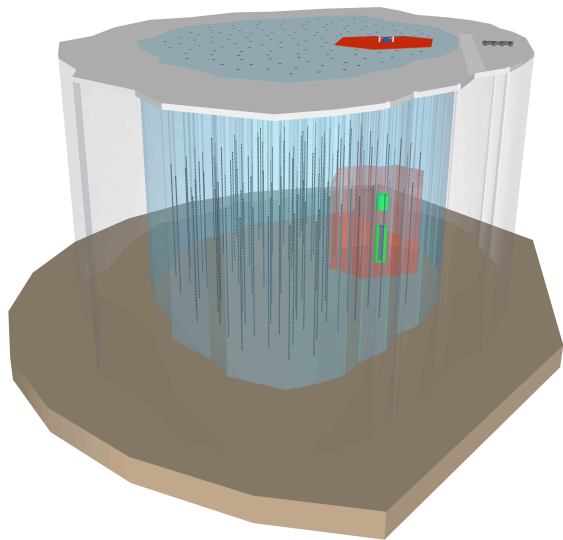
The major change in this revised proposal: the original proposal was for producing 9 stations and installing 7, and the revised proposal budget is for producing 3 stations and installing 2 stations.

My take

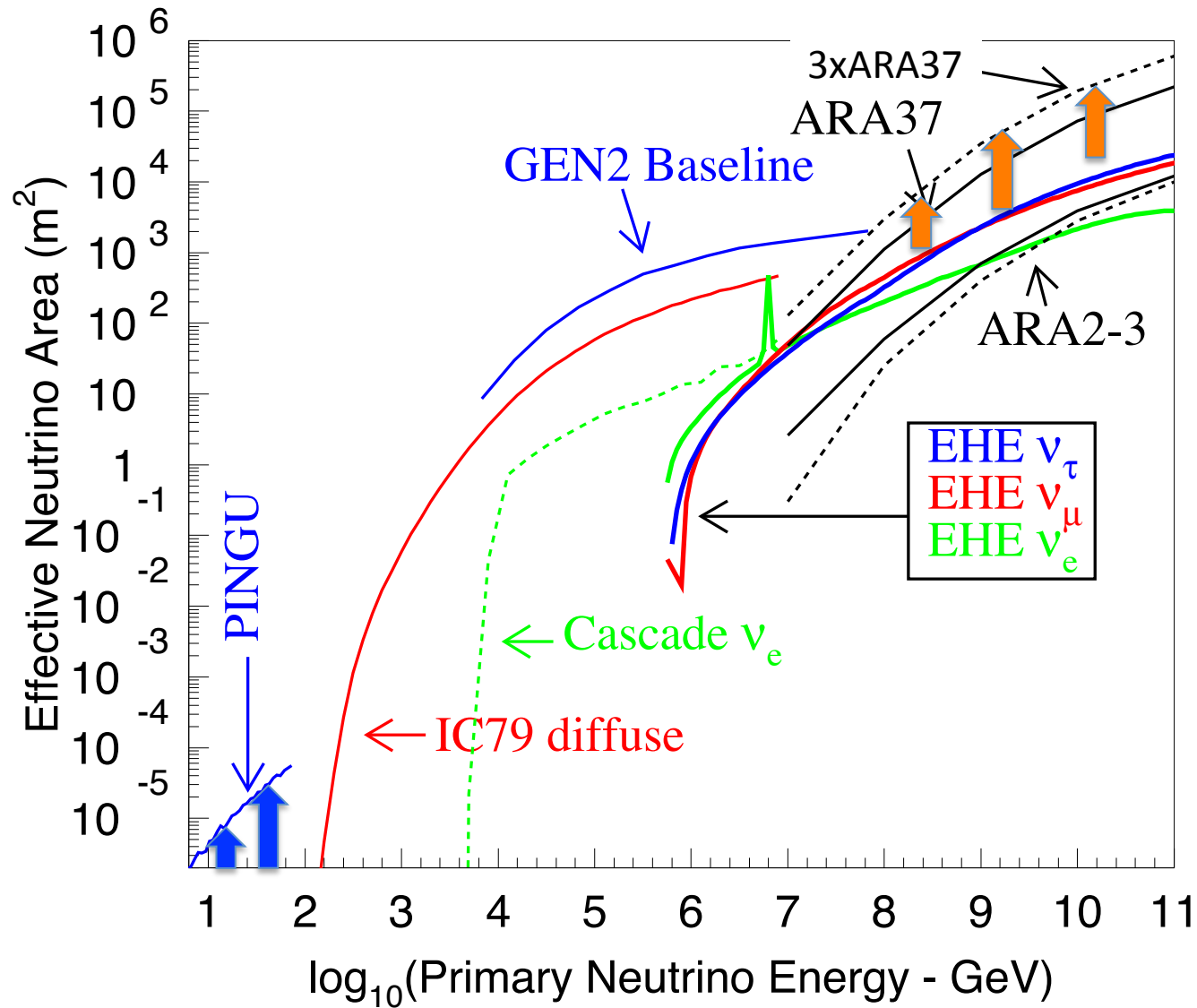
- Good progress on data analysis! 2 stations are running well.
- Collaboration is strong and getting stronger.
- NSF budget situation remains extremely difficult. The fact that OPP was absorbed in GeoScience doesn't help at all with current politics in Washington.
- Prospects for support for the much reduced scope are good (2 stations, assuming that could become 3 ..)
- Detector operations will be supported. Deployment in 16/17 or 17/18 quite likely.
- We should continue to use the pause in construction to also advance detector technology, example digitizer, triggering, geometry, interferometric triggering,.....
- Need to think about requirements, also in light of IceCube results.

Backup:

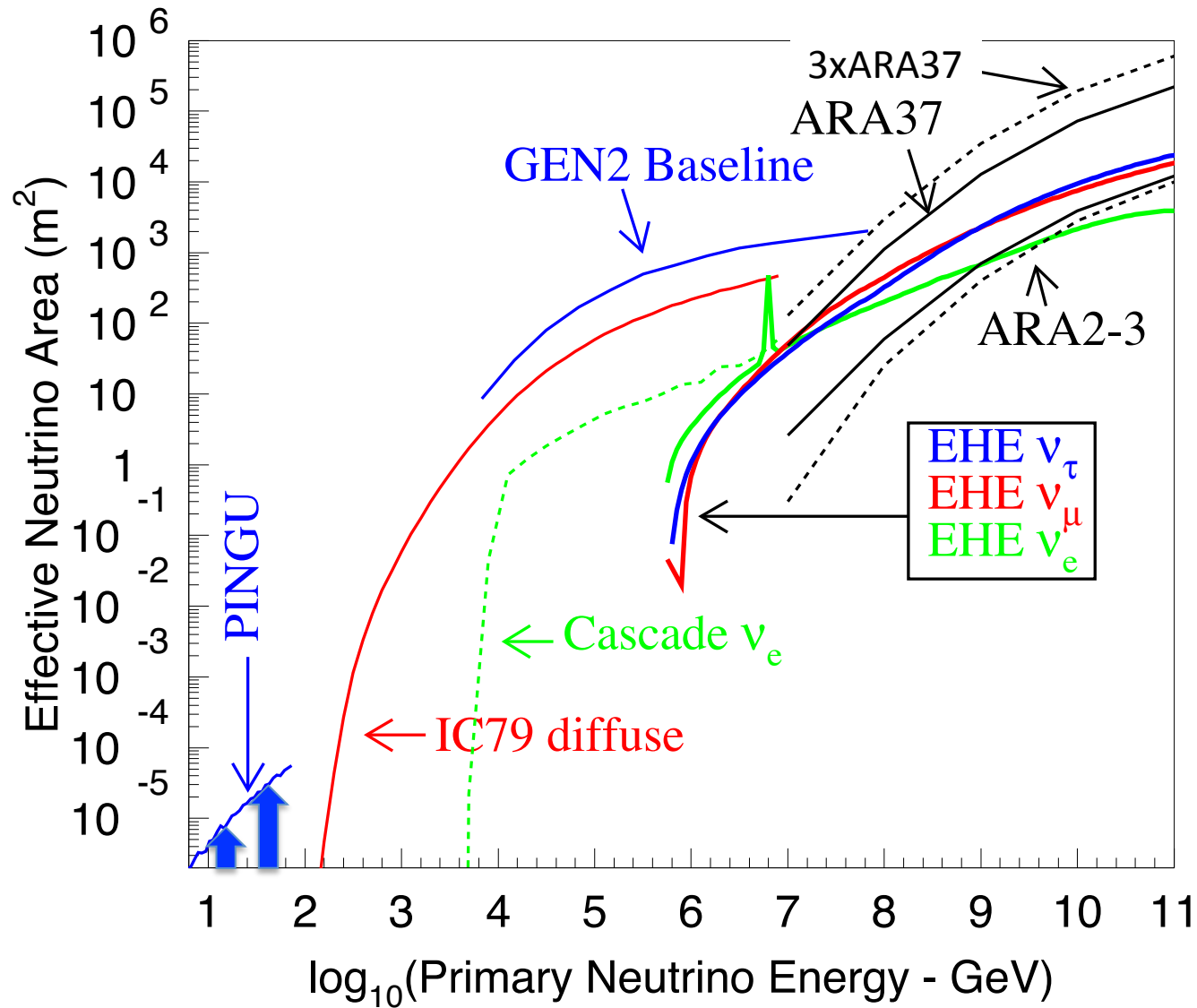
What is going on with IceCube?



Effective Areas



Effective Areas



*Slide shown at
IceCube meeting*

Radio and Gen 2

- Radio technique is cost effective method to detect neutrinos at very high energies.
- Coincidentally, South Pole ice is also a unique location for radio

ARA collaboration is currently pursuing the 37 station array

- ~\$100k/station
- \$7 millions ARA37 w/ \$2~3 million international contribution
- Future detector designs should be even better and still cheaper.
- A \$20M addition could increase Gen2 potential at GZK energies by 1 order of magnitude.

Logistics and infrastructure advantages suggest to consider an integrated approach for surface detectors.

Slide shown at
IceCube meeting

IceCube-Gen2 Facility

