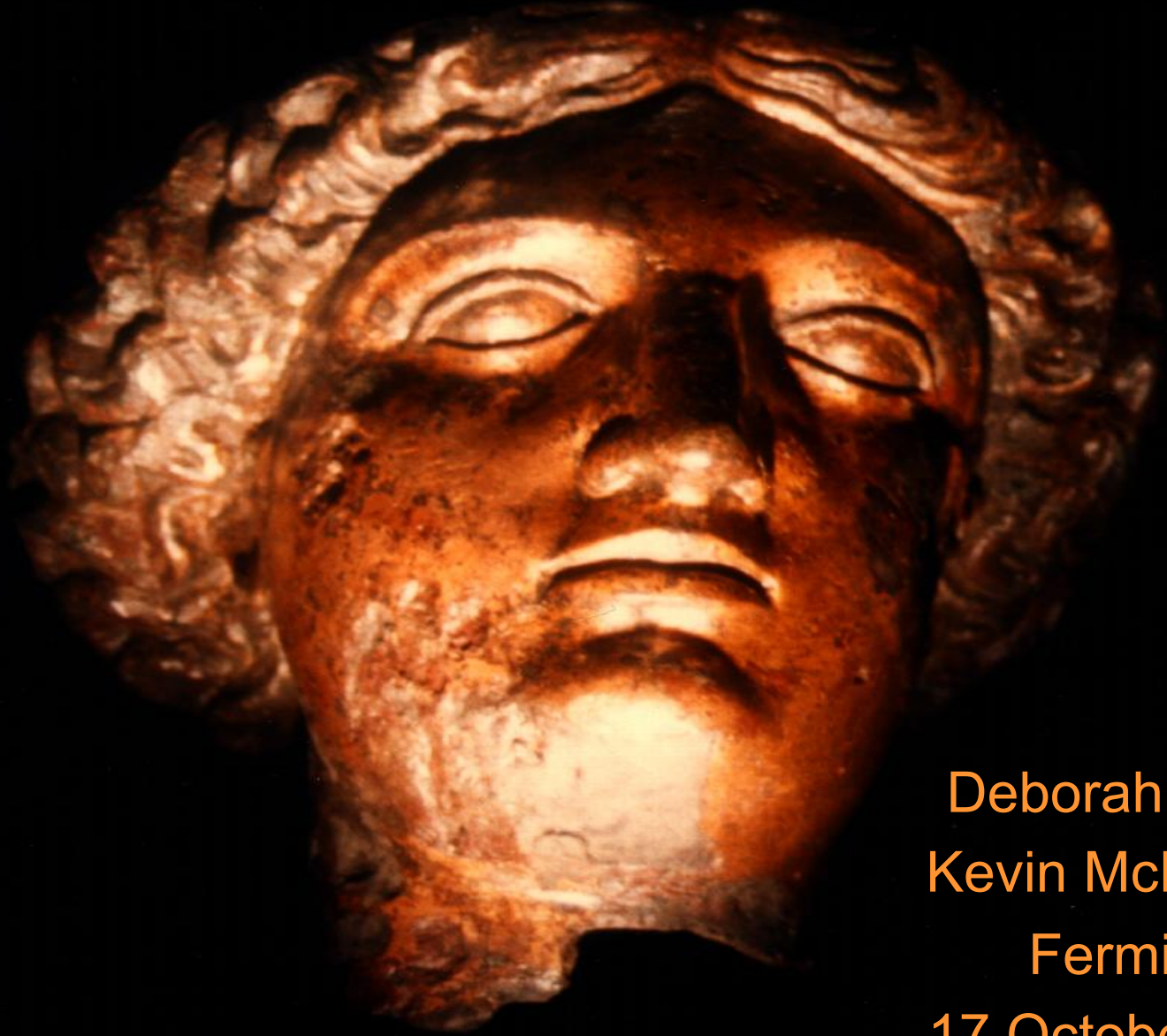
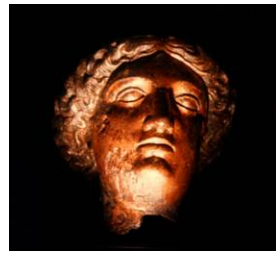


Resource Summary



Deborah Harris
Kevin McFarland
Fermilab
17 October 2016

Outline



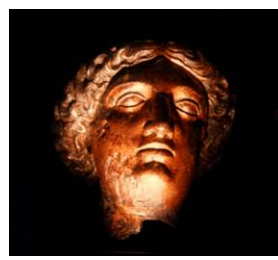
- Collaboration Resource Summary
- Neutrino Division
 - Personnel
 - M&S
- Particle Physics Division
 - Personnel
- Scientific Computing Division
 - Personnel
 - M&S
- Not covered: ESH&Q, Survey/Alignment, AD

Charge Questions



- Question 3: Have adequate resources from the laboratory and the collaboration been identified for an efficient and safe running of the experiment and for maintenance of the detector, and is it clear who is responsible for what?

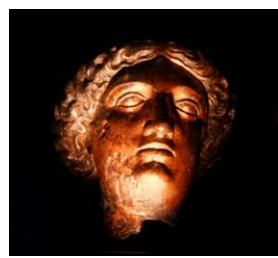
Collaboration Resource Summary



- Detector Operations: 4.6FTE
 - Run Coordinator: Howard Budd, University of Rochester
 - Detector Expert Coordinator: Nuruzzaman, Rutgers University
 - Detector Experts: 6 experts (mostly students), 0.2FTE each,
 - plus 2 training to become experts
 - This covers both MINERvA and MINOS detector Operations
 - Shift work: 8 hours/day, or 1.4FTE for a 40-hour work week
- Computing: 2.9FTE
 - Computing Infrastructure: 1FTE
 - Production: 0.7FTE
 - Keepup Processing: 0.45 FTE
 - MINOS data quality and validation: 0.2FTE
 - Software Releases: 0.5 FTE

8.5 FTE out
of ~42 FTE
total
collaboration
size

Neutrino Division Resource Summary



- Personnel (Operations Support Group)
 - Experiment Liason: Steve Hahn, 0.5 weeks/month or 0.125 FTE
 - MINOS Detector Experts: Steve Hahn, Donatella Torretta, Bill Badgett, has been 0.5FTE in the past
 - Expect this to be reduced now that MINERvA is taking over routine ND repairs
 - July 2016 test: DT/BB called 3 times and spent 10 hours total that month: estimate going forward: 0.1FTE
 - MINERvA DAQ Support (unpacking):
 - Donatella Toretta 0.14FTE in FY16 so far during Firmware tests, expect this to also be reduced

Administrative Support



- Julie Saviano: also supports MicroBooNE, Neutrino Detector R&D group
- Purchase requisitions
- Meeting rooms
- Collaboration Meeting Conference Exemptions
- Travel and G&V fund paperwork (Latin American program)
- Estimates 35% of her time on MINERvA

PPD Resource Summary



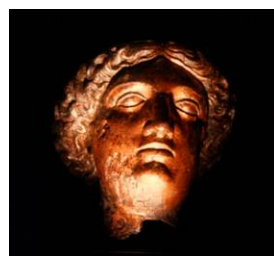
- Helium Target Filling and Emptying
- Water Target Filling and Emptying
- Roof Removal
- PMT Replacement
- Firmware Debugging
- DAQ support (in times of crisis)

PPD Resource: Safety Training Coordination



- Dee Hahn is the coordinator who works to ensure collaborators are trained for safe operations
- This is an equipment and personnel safety issue
- This is a critical service to the experiment
- Dee's work on MINERvA is 0.2FTE in FY16
- Dee's other efforts are on g-2, mu2e, CMS

PPD and ND Summary

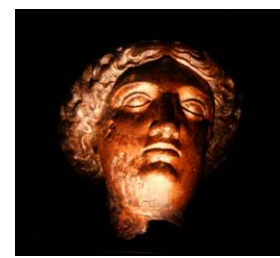


Task	PPD MED	PPD DDO	PPD EED	ND Ops Group
Liquid Targets	6	9		
Cavern Operations (roof, drip pans, PMT box swaps)		3	2.5	
PMT/FEB testing and repair	1		1.5	
FEB Firmware Upgrade completion			1.5-3.5	5
Solving current DAQ problems			5	4
Slow Control and DAQ diagnostics			2.5	
Light Injection support			0-4	
Underground computing and UPS needs	1			11
MINOS Near Detector and Coil Operations	0.5			10
Experiment Liaison				6
Shifter training and support		9		
Administrative support				
Total (FTE-weeks)	8.5	21	13-19	36
Total (FTE)	0.2	0.4	0.26	0.72

Total estimate* going forward: 1.6 FTE from ND+PPD

*Assumes that no major crises with DAQ, firmware, Light Injection

M&S Operations Budget Request



Item	cost (k\$)	Comment
Liquid Helium and Nitrogen for MINERvA	25	Based on current costs
ODH Heads	4	replace each year
Cryocooler refurbishment	12	assume we refurbish one per year
DAQ computers for MINERvA	5	assume we have to replace 1 per year
Argonne subcontract	40	MINOS electronics repairs (32k in FY16)
UROC Hardware	9	assume 3 new UROC's per year
CAEN Controller	8	only need if one breaks
CAEN PCI Card	8	only need if one breaks
Nearline Monitoring PC's	8	one need if one breaks
Consumables for PMT box repair work	10	MINERvA
Test Stand PC replacement	5	only need if one breaks
Spare Minder Cards	4	want 8 more minders
Spare Fan Packs (Rack mounted)	4	rack mounted
Materials and Shop MINOS test stand (cables)	3	
PMT and DAQ Test stands (consumables)	3	MINERvA PMT and DAQ
PC's for MINOS DAQ	10	replace old CDF ones, 4x2.5k each
DCS Computer for MINOS	3	
VxWorks License	25	Needed for MINOS, was 21 in fy15
Wiener Power Supply (5k each)	5	
Air filters for electronics racks	2	MINOS
Total	193	

Total Request:
193k/year for
MINOS
+MINERvA

Assumes we
fill He target

Assumes
certain rate of
electronics
failure and
spare stock
replacement

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History of M&S Budget (k\$)



	MINERvA		MINOS ND	
	Budget	Used	Budget	Used
2016	80	26	59	22
2015	245	130	123	67
2014	170	68	124	20
2013	133	121	187	160
2012	85	83	80	68

- This does not include G&V program, which supports Latin American students who serve as detector experts

SCD Budget Summary

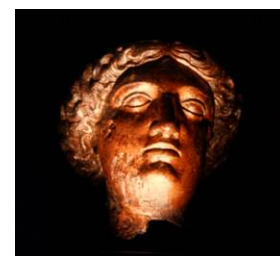


Table from EOP
Page 24
For 14 months, not 12!

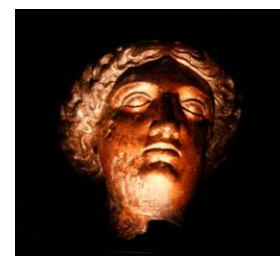
Media Type - Tape	TB written in the past year	Adjusted TB*	Cost
tape raw binary	16	18.67	\$560
tape supp / cal digits	15.5	18.08	\$543
tape reco	23.2	27.07	\$812
tape simulation	418.3	488.02	\$14,641
Media Type - Disk	Total TB allocated (private) / in-use (public)		
persistent dCache	193		\$5,629.17
raw data write dCache	132		\$3,850.00
read/write pools dCache	470		\$13,708.33
public scratch dCache	76		\$2,216.67
Total media cost			\$41,959.17

Marginal cost of computing	1 year CPU hours (millions)	CPU Hours**	Cost
data processing	3.9	4.55	\$45,500
simulation processing	11.7	13.65	\$136,500

Computing Labor	Neutrino Experiments (total FTE)	MINERvA (total FTE)	Neutrino Experiments (Incremental)	MINERvA (Incremental)
Software Development and Support	17.92	0.93	6.72	0.64
Operations	16.73	2.5	4	0.55
Facilities	22.4	2.45	4.5	0.53
Total	57.05	5.88	15.22	1.72

Media Cost	Cost (k\$)	
Media	15	Tape
	27	Disk
CPU	46	Data
	137	Simulation
Total	224	

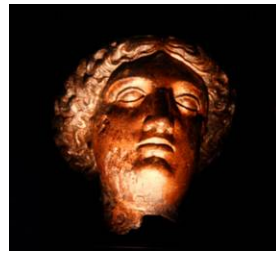
SCD Personnel Summary



Computing Labor	Neutrino Experiments (total FTE)	MINERvA (total FTE)	Neutrino Experiments (Incremental)	MINERvA (Incremental)
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Total	57.05	5.88	15.22	1.72

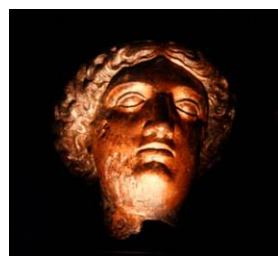
Total computing and media cost		\$223,959
SCD Support Services (5.88 FTE-year, 14 month period)***		\$1,715,000
Incremental Support Services (1.72 FTE-year, 14 month period)		\$501,667
Grand total (incremental)		\$725,625

Summary



- Experiment is in mature state
 - No planned future firmware upgrades
 - Just replaced several underground computers that were at end of life status
 - No planned future test beam runs
 - 8.5 FTE out of 45 FTE involved in operations
- Personnel needs from the lab for Operations are
 - Neutrino Division: 0.7FTE
 - After MINOS training is complete
 - Particle Physics Division: 0.9 FTE
 - Scientific Computing Division: 1.7FTE incremental
 - Take advantage of 5.9FTE in SCD, heavily matrixed
- M&S Budget estimate: 150-90k/year “pessimistic”

History of ND+PPD Personnel Resources



- Assuming 2000 hours/year
- Not including ND MINERvA group efforts (DH, MB, LB, JM, JK)

Charges (FTE)	FY14	FY15	FY16
MINERvA	1.2	3.0	1.7
MINOS Near Detector	0.5	0.6	0.6
Total	1.7	3.6	2.3

- Increase in FY15 was due to test beam and bulk of firmware upgrade work