

IST Report

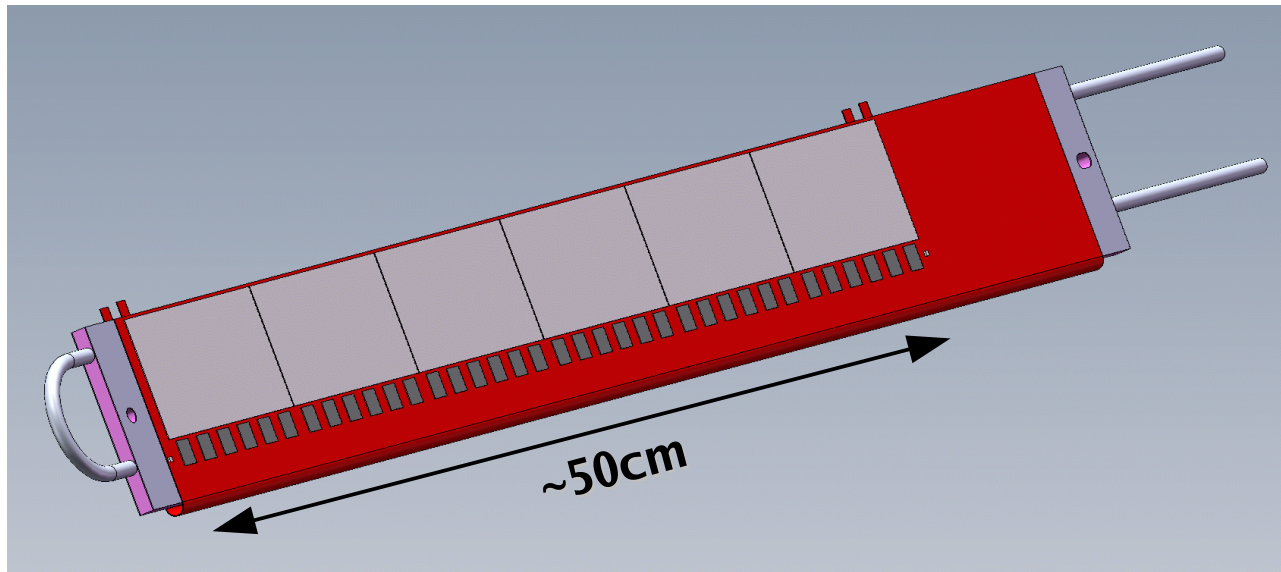
Gerrit van Nieuwenhuizen
MIT

IST presentation overview



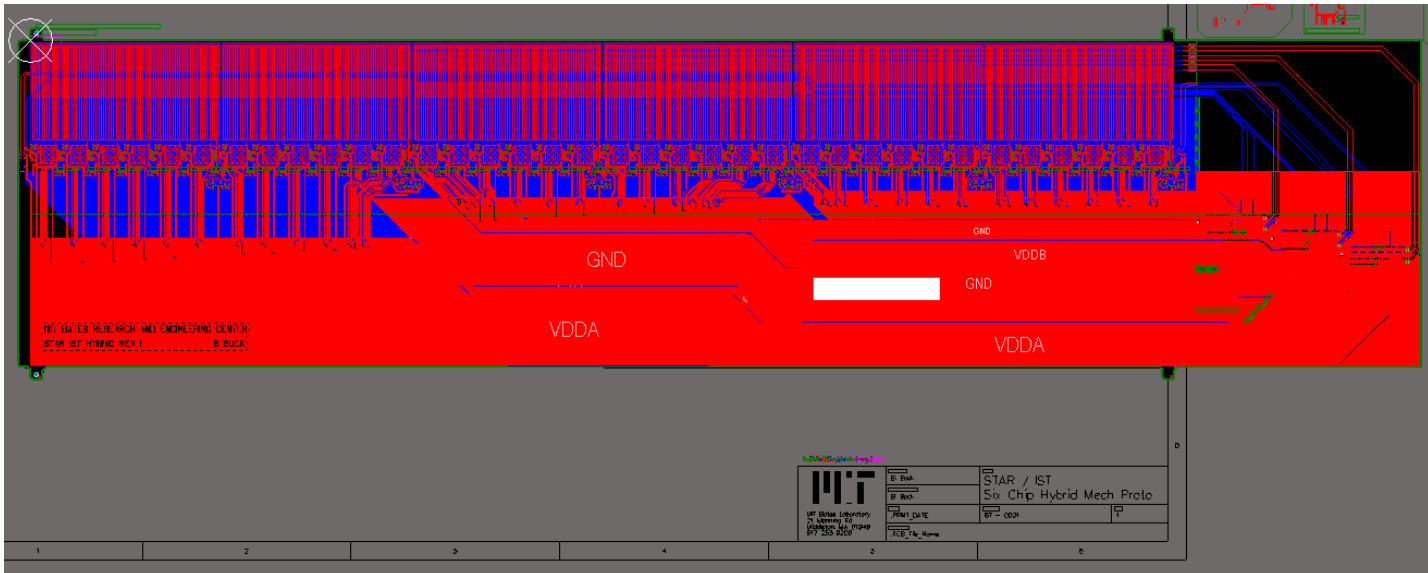
- Current status
- Short term planning
- Resources
- Slow controls
- Lab space

IST stave



IST stave = carbon fiber ladder + cooling tubes
kapton flex hybrid + passive components
6 silicon pad sensors
3 x 12 APV25-S1 readout chips
Design for prototype done, waiting for flex hybrid to
start tooling, production etc. Done 2nd half of October?

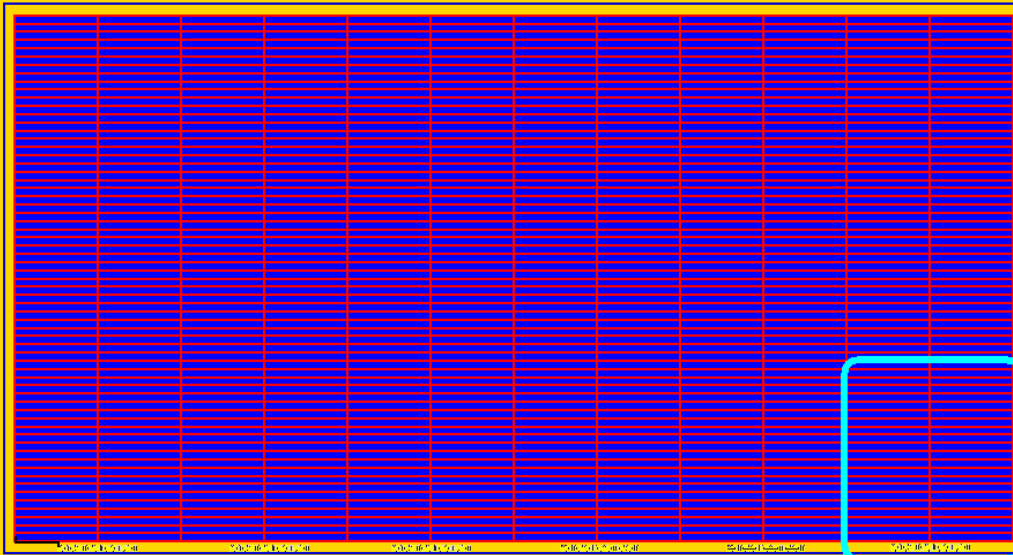
IST hybrid



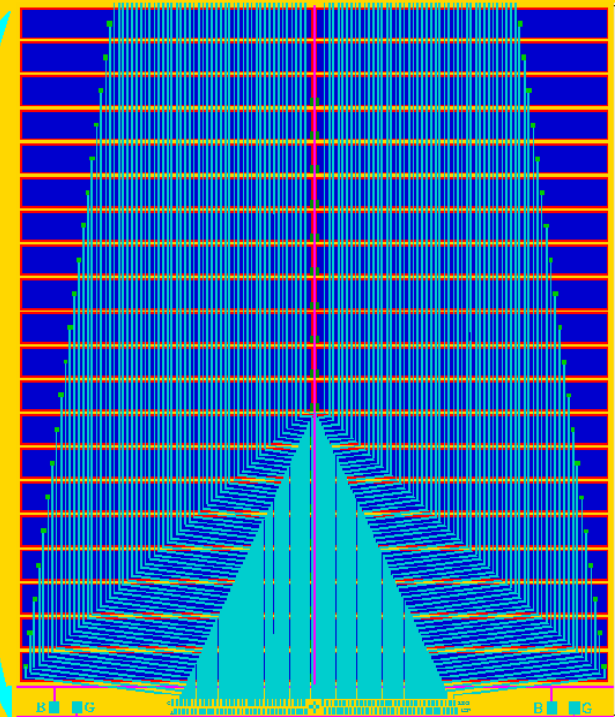
- ← 6 Sensors
- ← 36 APV25-S1
- ← cable, folds over to back

Design prototype hybrid finished and in production
First run failed: layer order mistake
Second run failed: misalignment, glue seepage, wrinkles
Third run with new subcontractor: shipping next Monday

IST silicon pad sensor



Silicon sensor size: 76.900mm x 40.000mm
Active area pitch: 6275um x 596um
12 columns x 64 rows



Mask drawings approved, 8 prototypes expected end of October

IST prototype stave



Produce hybrids

Send 10-12 hybrids to LBNL

Part used as mechanical samples

Two for final 2 prototype staves

Send back to Bates

Meantime 2 hybrids used for electrical testing

Mount on dummy stave

Place passive components

Place some APV chips for functionality tests

Get APV's bonded at BNL, test.....

At Bates prototype stave gets fully loaded

Bonded at BNL, tested

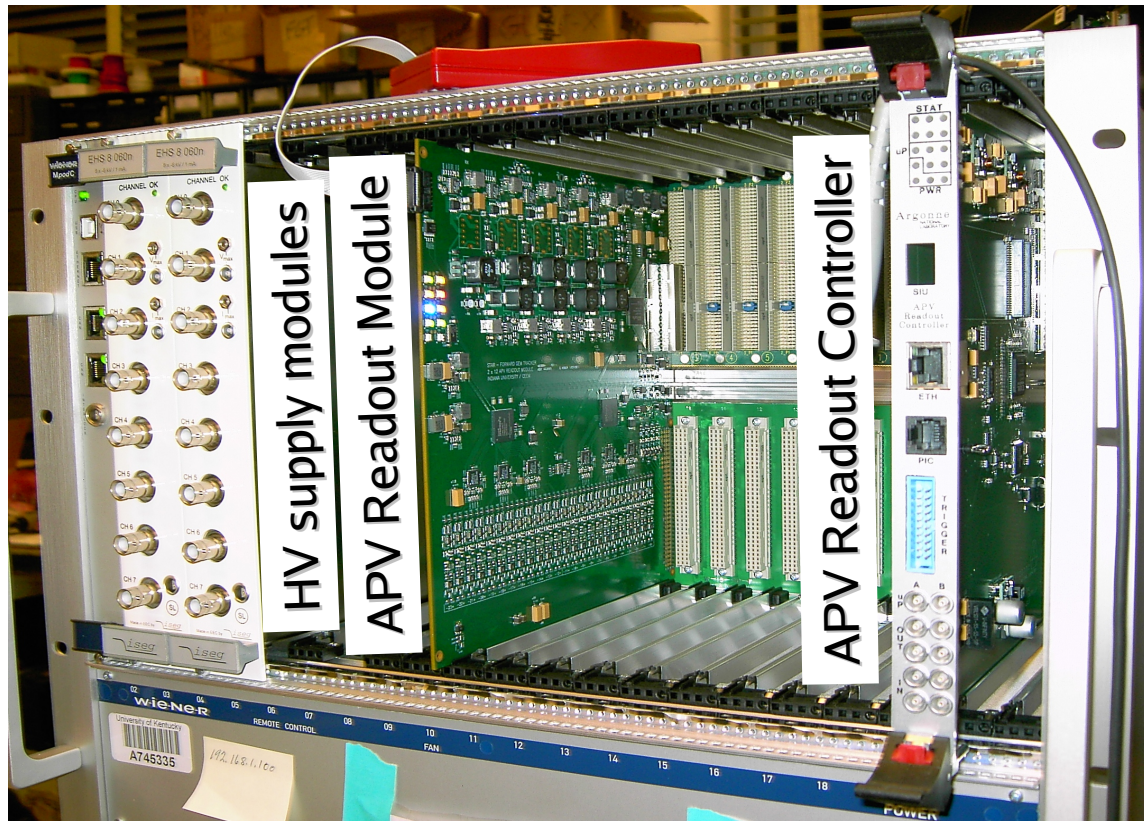
End of October prototype sensors arrive

Mount sensors at BNL and get bonded at BNL

Test as much as we can before end of CY2011

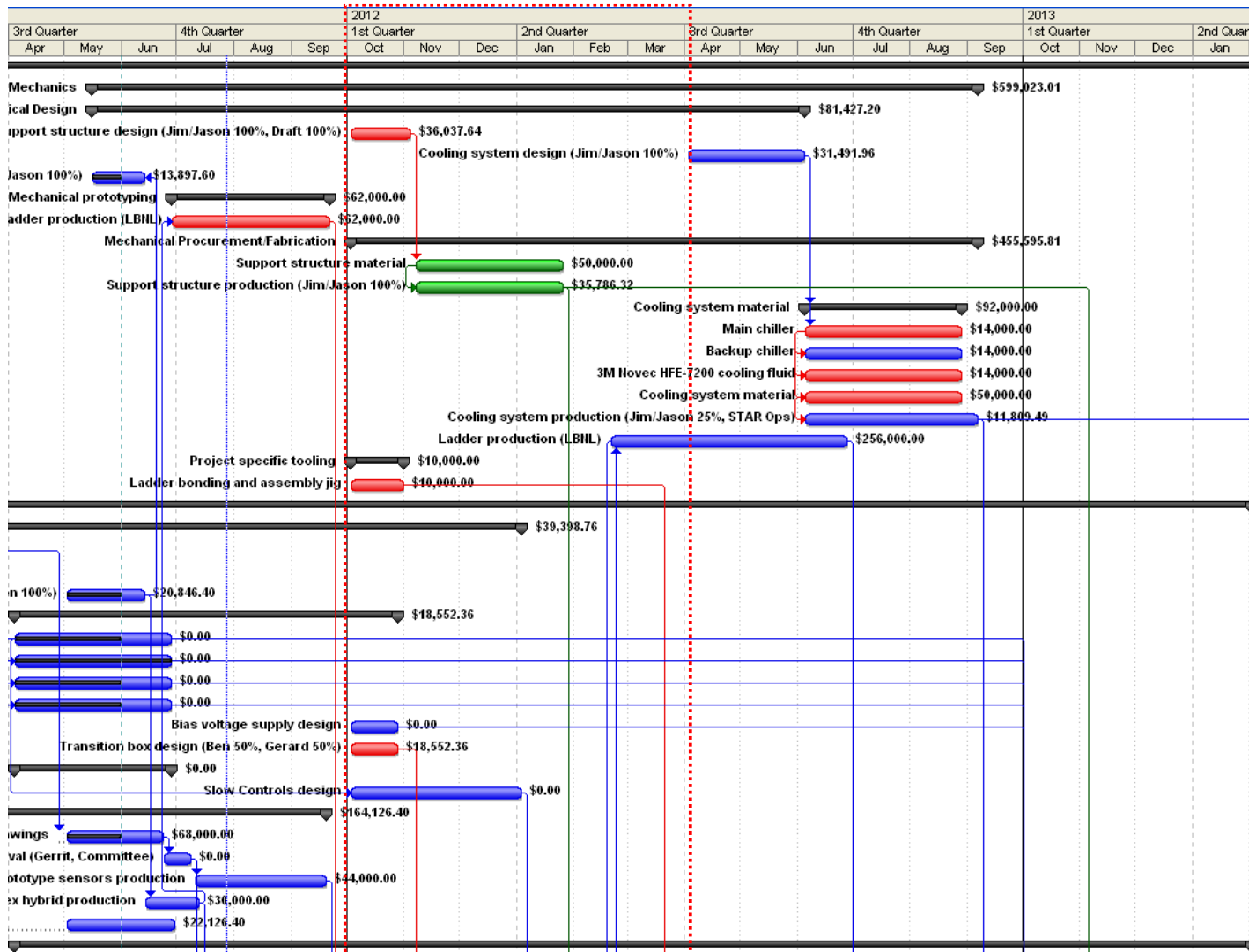
Note: most testing will be done on FGT test readout system

'IST' readout

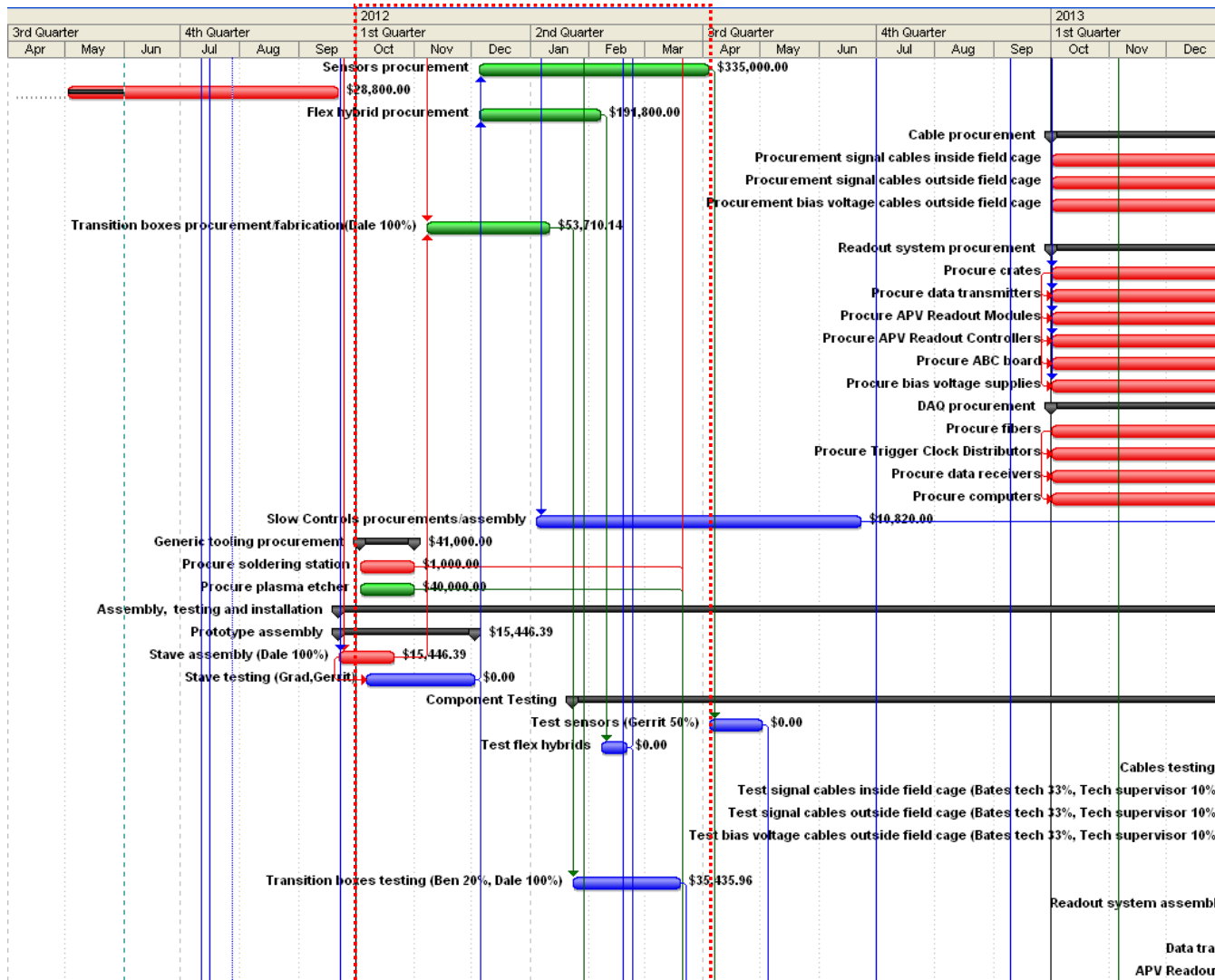


Lots of experience with running FGT cosmic ray tests
System is now able to read out more than 1 ARM after
ARC firmware got upgraded
HV units and slow control still being debugged

IST short term plans I



IST short term plans II



IST short term plans III



SoW_FY11_Addendum_Info_23Sep2011.txt x

Addendum to MIT-BNL FY2011 Statement of Work (version 07/29/2011)

Cost	%Cont.	WBS#	Type	Task description
\$36,038	34	1.3.1.1.1	labor	Support structure design
\$62,000	0	1.3.1.2.1	labor	Prototype ladder production at LBNL
\$14,000	36	1.3.1.3.3.1	material	Main chiller for cooling system
\$ 2,000	36	1.3.1.3.3.3	material	8 gallon cooling fluid (partial)
\$ 2,000	36	1.3.1.3.3.4	material	Cooling system material (partial)
\$10,000	64	1.3.1.3.6.1	material	Ladder bonding and assembly jig
\$18,553	10	1.3.2.1.4.6	labor	Transition box design
\$22,127	10	1.3.2.2.5	labor	Prototype readout system labor
\$28,800	0	1.3.2.3.2	material	Readout chips procurement (refund FGT)
\$40,000	48	1.3.2.3.3	material	Flex hybrid procurement (partial)
\$ 3,500	30	-----	material	Dicing of 5 APV wafers (not in WBS!)
\$ 2,000	14	1.3.2.3.4	material	One full set of IST cables
\$12,000	8	1.3.2.3.6.1	material	One readout crate
\$ 700	8	1.3.2.3.6.2	material	One DDL-SIU data transmitter
\$ 2,600	28	1.3.2.3.6.3	material	Two ARM boards
\$ 2,000	16	1.3.2.3.6.4	material	One ARC board
\$ 5,000	21	1.3.2.3.6.6	material	One 8 channel ISEG500 HV unit
\$ 700	8	1.3.2.3.7.3	material	One DDL-DIU data receiver
\$ 2,000	8	1.3.2.3.7.4	material	One DAQ PC
\$ 1,000	4	1.3.2.3.9.1	material	One soldering station
\$40,000	30	1.3.2.3.9.2	material	One plasma etcher
\$15,447	10	1.3.3.1.1	labor	Prototype stave assembly

\$322,465		(Probably \$62,000 covered by LBNL addendum?)		

IST slow controls



- IST system very similar to FGT system, so steal as much of the FGT slow controls as possible
- See if we can get the Valpo people on board for the Epics Stuff
- Most slow controls are going through the readout system (hopefully, like using similar ISEG HV units)
- Cooling system is separate, failure of this system should be interlocked to the IST readout system
 - gracefully shutdown system (=readout crate)

IST human resources



Name	Function	Affiliation	Expertise
<u>Bernd Surrow</u>	Physicist	MIT	Sub system manager
Gerrit van Nieuwenhuizen	Physicist	MIT	Detector development
Ben Buck	Electronics Engineer	MIT-Bates	Front End Electronics, Readout
Gerard <u>Visser</u>	Electronics Engineer	UICF	Readout, DAQ
Jim Kelsey	Mechanical Engineer	MIT-Bates	Support Structure, Cooling
Jason <u>Bessuille</u>	Mechanical Engineer	MIT-Bates	Support Structure, Cooling
Eric <u>Anderssen</u>	Mechanical Engineer	LBNL	Support Structure
Dale Ross	Technician	MIT-LNS	Assembly
TBD	Technician	MIT	Assembly
TBD	Technician	MIT/BNL	Wire Bonding
Don <u>Pinelli</u>	Technician	BNL	Wire Bonding

We can manage until 3rd quarter FY12, then need more people (min. 1 grad)

IST lab space



IST will make use of Room 1-88 in Physics as an assembly, testing and staging area

What makes testing complicated in this lab is that an independent DAQ system needs to be set up

IST will make use of part of the Clean Room in the STAR Assembly hall.

With all the FGT and other HFT stuff going on there we could run out of space.