

WBS entry	Task Description	Est'd hours	Assigned to	Priority
1	Hawaii-1 to Hawaii-2RG installation preparation			
1.1	Mechanical installation of H2RG array mount Test detector, cables, SWIR array	8		Critical path
1.2	SDSU Gen III controller board modifications	8		Critical path
1.3	SDSU DSP code development for H2RG on SDSU Gen III			
	(1.3.1) Full array readout, 100 KHz, pixel resets	120		Critical path
	(1.3.2) Full array readout, 300 KHz, pixel and line resets	40		Medium
	(1.3.3) Dynamic loading of DSP code	8		High
	(1.3.4) "Windowed Mode", subarray operation to read LM quickly while YJHK integrates	160		Low
1.4	New "LiL" userspace library for H2RG array ops, deinterlacing, etc.	80		High
2	Hawaii-1 to Hawaii-2RG Integration and Test			
2.1	Warm testing of SWIR array	40		Critical path
2.2	Initial Cold testing of SWIR Hawaii-2RG			
	(2.2.1) Light sensitivity, clocking, biases, deinterlacing	40		Critical path
	(2.2.2) Array characterization: Read noise, gain, QE	16		Critical path
	(2.2.3) DSP optimization for observing (full frame)	40		Critical path
2.3	SWIR to LWIR transition			
	(2.3.1) Replace SWIR array in mount with science-level LWIR			
	(2.3.2) Warm testing of LWIR array			
	(2.3.3) Cold testing of LWIR array (repeat WBS 2.3 tasks)			
	(2.3.4) Characterization of observing modes (stray light, sensitivity, FoV)	40		Critical path
	(2.3.4.1) Imaging			Low
	(2.3.4.2) JHK long slit spectroscopy			High
	(2.3.4.3) LM long slit spectroscopy			Medium
	(2.3.4.4) Echelle spectroscopy, R=30,000			Critical
	(2.3.4.5) Echelle spectroscopy, R=60,000			Medium
2.4	Integrate Gen III controller with ARIES server and GUIs			
	(2.4.1) Upgrade GUI to current server	40		High
	(2.4.2) FPA plugin for H2RG selectable	40		High
3	Optomechanical & Operations tasks for ARIES			
3.1	Ortho-tilt on echelle grating (motor or feedthru)	120		High
3.2	Thru-slit in Si fabrication (better resolution, throughput & in-house fab)	160		High
3.3	ZnSe/Al2O3 cross disperser: design, fab, generation of new optical mounts	300		High
3.3	Replace rubberized heaters for fill flanges with kapton heaters	4		Low
3.4	Ethernet controlled power control, integrate motor controllers onto instrument	40		Medium
3.5	F/11 refractive optics rework, fabricate, install, test	160		Medium
3.6	Merge remote monitoring and housekeeping into server and GUI	40		Medium
4	Calibration Unit			
4.1	Initial design	80		High
4.2	Fabrication	160		High
4.3	Lab integration & testing	80		High
5	On-sky Testing	80		High
5.1	FPA performance, sensitivity, scattered light, gain, read noise, linearity			
5.2	Calibration system testing; systematics at very high SNR			
5.3	Characterization of observing modes			
	(5.3.1) Imaging			
	(5.3.2) Long slit spectroscopy (JHK and LM)			
	(5.3.3) Echelle spectroscopy (R=30,000 and 60,000)			
6	Documentation	80		Medium
6.1	Refine observer's wiki			
6.2	Data processing collaboration effort			
6.3	Observation planning tools (echelle simulator, exposure time calculator)			