

Data Archive and Remote Observing

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Data Archive & **Remote Observing**



















The CHARA Server

- Located at GSU Data Center
- 3 Virtual Machines:
 - Remote Observing
 - Remote Data Reduction
 - Archive + Database



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Remote Observing



Screenshot courtesy of Katie Lester

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Remote Observing

- Connect to Atlanta machine • using VNC
- Atlanta machine connects to • mountain using SSH tunnel
- CHARA software is the same • as that on the mountain









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Remote Observing Stats



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Remote Observing Stats (2020 Only)



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Remote Observing

94% Remote Nights77% Internal17% Open Access

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Remote Observing Conclusions

💕 Applications 🗰 नंग 🗰 नंग 🗰 नंग 🗰 नंग 🗰 नंग 🗰 नंग 🗰 द 🗰 C 🗰 C 🗰 E 🗰 F 🗰 🗰 P7 🗰 P 📾 S 🗰 S1	🖬 W1 💵 E1 📾 T 📾 T 📾	WEATHER + _ D X	🔽 P7. + _ D. x 📃 PICO: IR1238 + _ D. x
51 ACQU + 0 X V1 ACQU + 0 X E1 ACQU + 0 X	COSMIC DEBRIS - PRIMARY + - D X	SCOPE UT WIND DIR GUST DIR MEAN Tout Tounk RH DP/P Ttel RHtel	IR(4)558 ‡ X=0 UP Y=0
	LOCAL TIME: 03:27 CHARA TIME: 11:27 SIDEREAL TIME: 08:55 CHK: HD_91810 HOUR ANGLE: 01:42	✓S1 11:27 0.0 181.4 5 6.9 184.2 0.0 6.9 19.4 44.9 -4.3	MOVE LEFT BIGHT
	JOB QUEUE: 0 START JOB QUEUE STOP JOB QUEUE CLEAR JOB QUEUE PI: Lester Prog: 2018B-CL1	✓ S2 11:27 0.0 4.2 N 4.6 9.8 0.0 6.3 17.5 53.8 -2.3	INTRALIZE PARTIES COMM. RECEIPT
	CONTROL STARS CALIBRATORS CONFIGURE	✓ E1 11:27 0.0 1012 E 0.0 0.0 0.0 7.3 19.9 49.2 -2.7	QS QL Q2 SMALLER DOWN BRUCER
	SLEW TO OBJECT WHEN FIND IRC HD 89822	VW1 1127 00 1238 55 56 2616 17 64 164 437 52	PING BEOPEN 25 OK
	NUM 134793 IRC HR 4072 HD 89822 SAO 15163	✓ W2 11:26 0.0 261.6 W 0.0 0.0 0.0 5.8 16.1 40.5 -6.7	Out Pico: IR23 + _ ID ×
	CLEAR R4-10-24-02-8461 DEC +45-33-59-124 Vinan: 4-93 Kman: 5-00 Time A1 Vin555thin AZEL-16-555-0	✓L1 11:27 0.0 180.0 S 0.0 0.0 0.0 21.9 23.5 21.5 825.2 — —	x=0 UP Y=0
		NO PLOTS DUST PING REOPEN QUIT	LEFT RIGHT
	SLEW TO CHECK WHEN PINDING >> HD 91810 <<		SMALLER DOWN RECEPT
	NUM 136498 IRC HR HD 91810 SAO 27707	OPLE 1 T = E X	
	CLEAR RA: 10 37 20.5509 DEC: +56 25 52.831 Vmag: 6.53 Kmag: 4.18 Type: K1-IIIbCN1.5(AZ/EL: 30.6/61.8 9.24	MESSAGES CONTROL SCAN OFFSETS TUNE 1 TUNE 2 STATUS CONFIGURE	
51 + 0 X WI + 0 X EI + 0 X - + 0 X TIPT + 0 X	Tprit chanse Berkels is E2	S1 : K BAND : GO STOP ZERO STOP HERE	PICO: IR123A + _ C ×
MAIN CONT ADDIST WES MAIN CONT ADDIST WAS MAIN FORT ADDIST WES EXP. CCD	Working out reference cart. Informing beam combiner on scopes.	BACKWARD -1.50/-0.50 cm 51: -10nm	X = 0 UP Y = 0
TELEVISION TELEVISION TELEVISION SERVO CONTROL	Initializing beam combiner astromod.	Start (m) -0.01000 CENTER Pos: -0.94 cm	LEFT RIGHT
ACQ CCOUT FIND ACQ CCOUT FIND ACQ CCOUT FIND MODXY REMOTE	Array configuration: Thirdeness 51 Anno 1901 Rause BEAM1 ArTINE	Stop (m) +0.01000 FORWARD Scan: 1/30 E1: 5nm	CHALLED DOWN RECEP
SPY1 SPY2 MIDAL SPY1 SPY2 MIDAL SPY1 SPY2 MIDAL FAINT STATUS	Nelescope S2 hop Full Beam BEAM4	Inc (m) 0.001 DECREASE File: 000	FRINGE 12 SIGNAL + _ D X SUM + _ D X
SPY3 BIAS ZBIAS SPY3 BIAS ZBIAS SPY3 BIAS ZBIAS SFFING PING	Netexcope E1 Pop DPUT Beam BEAMS ALTIVE.	Freq (Hz) 200.0 EDGE Vel: 149.41 um/S W1: 1nm	a la data a da sa a Mala
ON OFF ADJ ON OFF ADJ ON OFF ADJ 2.7 6.8	Telescope W1 Pop POP4 Beam BEAM2 ACTIVE. Telescope W2 Pop END Beam BEAM5	Number 30 INCREASE Time: 30.5	TANA AND A
ZOOM CLEAR ZOOM CLEAR OFF OFF	tiptil: 51 Det RMS 0.16" r0 1.3cm Seeing 5.34" ZD Corr r0 = 1.3 Seeing 5.34" tiptil: w1 Det RMS 0.13" r0 4.8cm Seeing 1.83" 2D Corr r0 = 4.8 Seeing 1.83"	51: 40.53m E1: 36.22m W1: 26.00m	
TV TRACKING: TV TRACKING: TV TRACKING: RESTART SOCKET	tipit: E1 Det RMS 0.10* 70 6.0cm Seeing 1.52* 2D Corr 70 = 6.0 Seeing 1.52* tipit: S2 Det RMS 4 96* 70.0 cm Seeing 0.00* 2D Corr 70 = 0.0 Seeing 0.00*	Err -1nm Err 0nm Err 0nm	Theorem and the Characteristic of the Annual State Structure and the State Structure and
ON OFF S88 ON OFF S88 ON OFF S88 OUT	tipHi: W2 Det RMS 27.13* r0 0.0cm Seeing 0.00* 20 Corr r0 = 0.0 Seeing 0.00* toth: € 2 Det RMS 106.87* r0 0.0cm Seeing 0.00* 20 Corr r0 = 0.0 Seeing 0.00*	ALL OFF STARS STOP BLS OPLESTING HING REOFEN QUIT	
SET CEN ADJ SET CEN ADJ SET CEN ADJ	opie: Luing astronom library for all calculations.	CLIMB 3. F C.X	Silvershifting, dalamadanan processional
GET GRAB MOVE GET GRAB MOVE GET GRAB MOVE	opie: using astromoti itorary for all calculations.	MANN SETUR-MOD DUTHER RUTHER AUDIMENT TWO REAM THREE BEAM STATUS CONFIGURE	
DOME ADJUST: DOME ADJUST: DOME ADJUST: PPS 3.2	OPT DELAY HIGH SINR VERBOSE REOPEN PING END NIGHT REPORT QUIT	148 * Stud Data Stinlow WGT The Memory START STOP	
CCW STOP INIT CW CCW STOP INIT CW CCW STOP INIT CW = + = = × Max12369.4	TIPTET STATUS	2018 12 11 NOSTAR climb1 001.fit WAITING TO START. Scans 0 SERVO ON	FRINGE 23 SIGNAL + _ C X FRINGE POWER SPECTRUM + _ C X
ADTOCOME: ADTOCOME MORE ON OFF HOME ON OFF HOME Stiddev1384.7	Local Trr: 3:27:28 N SUM Drrs Mrrs SRV r0 SD ZD ZCr0 ZCSD MS Snd	V12 0.24 2.905 V23 0.45 41.694 V31 0.23 14.982 Gain A -0.70 Gain 8 0.70 Pro 1.0 Terr 0.0 Pro 4.0 Terr 0.0 Pro 4.9 Terr 0.0 Minwet 1.00 Maxer 3.000	
POINTING SERVO: POINTING SERVO: POINTING SERVO: STOP	CHARA Trr: 11.27.28 51 1 3182 0.14 0.89 ON 2.7 2.94 0.0 2.7 2.94 ON LOST T/S 120 VU 1 1987 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	S1: -10417.7um E1: -4166.3um Counts: 160.6 152.3 123.0	
ACQ TIP/TILT ACQ TIP/TILT ACQ TIP/TILT	ExpTr m5: 5 E1 1 3436 0.09 0.29 ON 10.6 0.95 0.0 10.6 0.95 ON ExpTr 5: 158 00 52 3 130 5 0 00 00 00 0 0 0 0 0 0 0 0 0 0 0 0	POSA POSA++ POSB POSB++ SMALL LARGE BIG HUGE	
ACQ & T/T FINDER ACQ & T/T FINDER ACQ & T/T FINDER	Frame Tp: SUB_FRAME W2 3 4 X XX 0 00 OFF 0.0 0.00 0.0 0.00 0.0	SERVO SAVE DIFF/SIG FILT AUTO UP DN FRGTRCK ABORT	A A A A A A A A A A A A A A A A A A A
NO SERVO ZERO T/T NO SERVO ZERO T/T NO SERVO ZERO T/T	Frame 52: 21 18 SIGNALS: ON	MINWGT++ MINWGT- MAXERR++ MAXERR- G++ G- DIR A DIR B PSN	
GENERAL: GENERAL:	Npixels 378 RMS PER: 5,000 OK	NIROCOMM ENABLE DISABLE PING REOPEN CLEAR DISP VME QUIT	
STATUS CONT STATUS CONT STATUS CONT			
HD 91810 CC Out HD 91810 CC Out HD 91810 CC Out 10 3720.4 +56 25 55.2 10 3721.7 +56 26 0.9 10 3717.8 +56 26 12.1	TELESCOPE WI STATUS		FRINGE 31 SIGNAL THE REPORT OF A SUMPLY OF
Azel + 30.8 61.8 Azel + 30.4 61.8 Azel + 30.5 61.8	CHARA TH: 11.27 TT E1 : 0.1104 Frms/Sec D-2; 2.2 P-2; 2.2		
PING BEOPEN PING BEOPEN PING BEOPEN	Lost T/S: 0/ 0 TCS RA : 10 3/ 21.6/ Mn/Mx/Te: 0 204 0 T/RH bnk: 9.0/ 30.7 TCS Dec : 56 26 00.97 Size/Rad: 640 480 10		
DUT DUT OUT	huT Stat: Dome Posi + 430.7 Origin : 327.00.253.00 Star : HD 91810 TCS Az : +30.4 +30.4 Pos : 327.00.253.00		
	Sig/rate: T/T-50C158.0HzTC5 EI : 61.8 61.8 Az/EI : -0.000/ 0.000 Period : 100 Crn Cube: Out BOX : (0, 0) (639,479)		
Secondary Control	Servo : Wobb 1 Sin : No / 1.0 Tracking: OFF		
	UN CON		

Popular... but also mandatory

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Remote Data Reduction



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Remote Data Reduction

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- Data Reduction Machine linked to archive
- Reduce data remotely
- Download final reduction
- Benefits:
 - Reduction software always up to date
 - No need to download raw data

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Cross-platform



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Remote Data Reduction



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Online Database Preview

CHARA Database Query Form

Select a database:

- ⊖ Classic
- O CLIMB 1
- O CLIMB 2
- \bigcirc PAVO
- ⊖ MIRC-X

Submit















Online Database Preview

CHARA Database Query Form

Star Name	
HD_128165	
Start Date	
05/01/2018	8
End Date	
05/31/2018	8
Display:	
id SIMPLE BITPIX	^
NAXIS	~
Submit	

SQL Command) SELECT CCSTARHD,CCOBJTYP,CCUTDATE,CCUTTIME,CC_BEAM6,CC_BEAM6 FROM classic WHERE CCSTARHD = 'HD_128165' AND date(CCUTDATE) >= date('2018-05-01') AND date(CCUTDATE) <= date('2018-05-31')

CCSTARHD	CCOBJTYP	CCUTDATE	CCUTTIME	cc_	_BEAM5	CC_BEAM6	
HD_128165	OBJECT	2018-05-04	11 02 11.709	E1		W1	
HD_128165	OBJECT	2018-05-04	11 53 15.724	E1		W1	
HD_128165	OBJECT	2018-05-04	12 29 33.107	E1		W1	
HD_128165	OBJECT	2018-05-05	10 45 51.115	E1		S1	
HD_128165	OBJECT	2018-05-05	11 25 58.616	E1		S1	
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Online Database Timeline

- Minimum Working Prototype
 - Something from all Combiners
 - Technique for Creating "all_chara" table

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- April 2021
- Full Version
 - All Data
 - Feedback Incorporated
 - Fall 2021

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Summary

Remote Observing



Archive + Database

Remote Data Reduction







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