

# Interacting with the HET Queue

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[\*\*http://rhea.as.utexas.edu\*\*](http://rhea.as.utexas.edu)

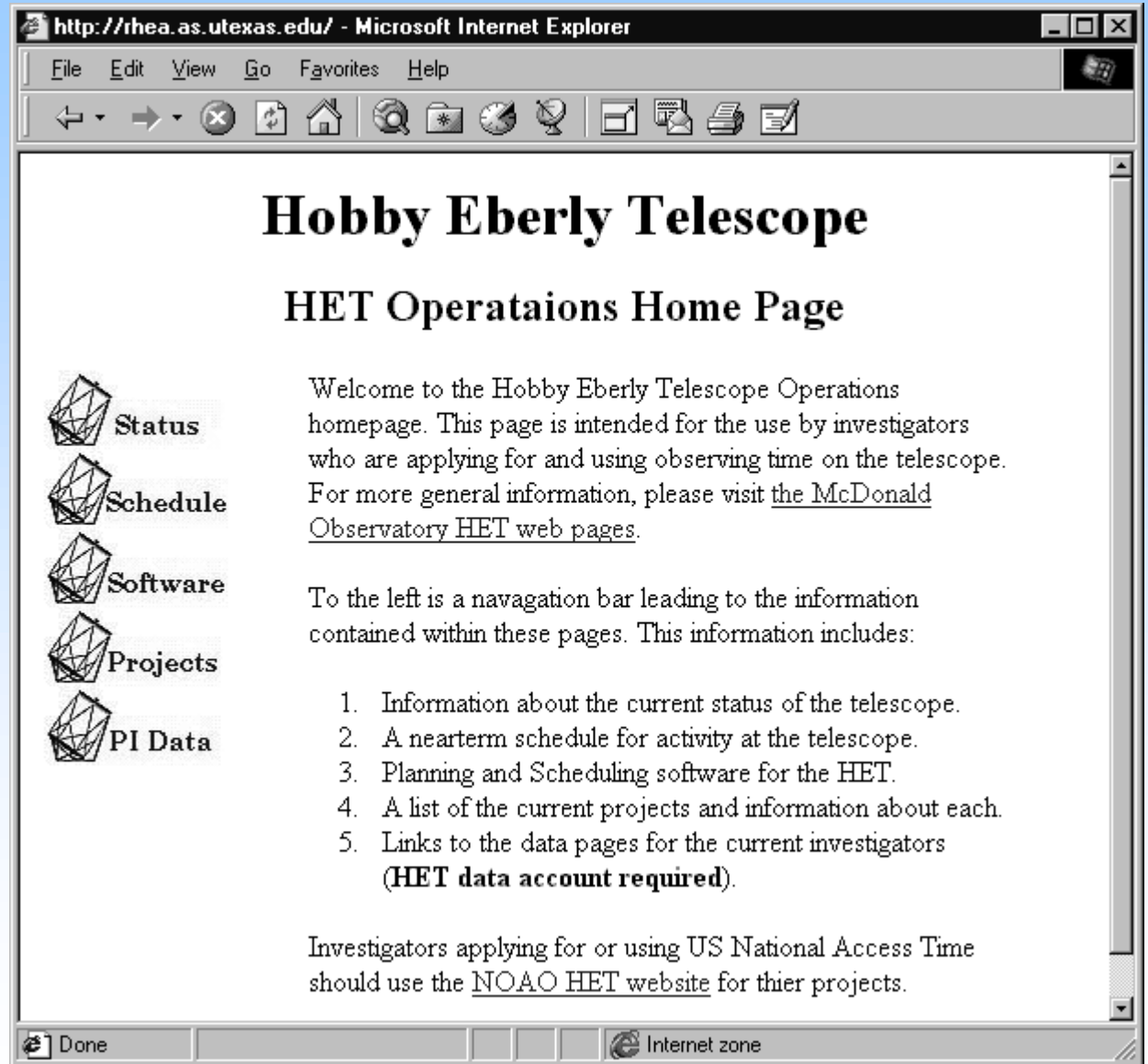
# The HET Queue Observing Scheme

- Challenges in the scheduling the HET include
  - 85% of time on HET will be queue scheduled time, shared by 5 institutions and US National Access
  - Must be dynamically scheduled as observing conditions change
  - Must complete projects to PIs' satisfaction
  - Must adhere to the Time Allocation Committees (TAC) rankings
  - Must balance time according to institutions' allocations
- Principle Investigators (PIs) interact with HET queue at three points
  - Proposal submission to local TAC (Phase I)
  - Observing plan submission to HET Operations (Phase II)
  - Data retrieval/verification from HET Operations and plan revision in conjunction with HET Operations (Phase III)
- HET partners will interact with Austin based HET staff while National Access time will be handled by NOAO (<http://www.noao.edu/noaoprop>).

# HET Operations Homepage

Supplies all information about what is and what can be done with the HET including:

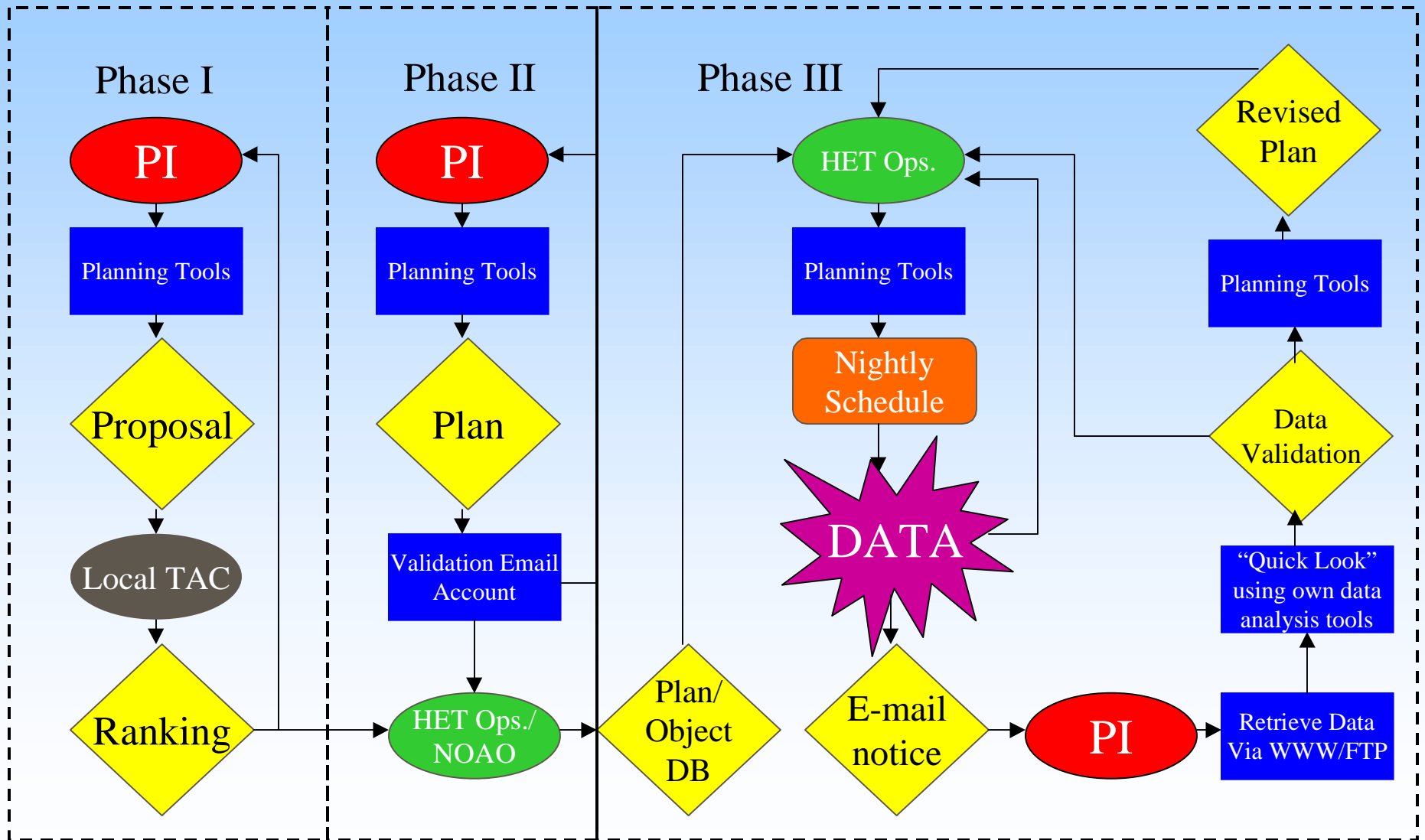
- Summary of Status and Schedule of the Telescope
- Distributes planning and scheduling software
- Information about current projects
- PI plan review and data retrieval system (password protected)



# HET ↔ PI information flow

- HET has a three phase process for acquiring data.
  - Phase I is the traditional telescope proposal phase.
    - + PI uses planning tools to demonstrate feasibility of project to TAC.
  - Phase II is when PIs with approved projects describe in detail all observations needed for their projects.
    - + PIs use the same planning tools as in Phase I to plan and sequence observations.
    - + PIs create observing scripts in plain text using any text editor.
    - + Scripts are submitted and automatically verified via e-mail.
  - Phase III is the data acquisition and distribution phase.
    - + HET staff uses PI-submitted scripts to schedule and execute observations that satisfy the PI's needs and requests, using the same planning tools the PI used.
    - + PI can retrieve data in semi-real time, examine it using familiar tools (IRAF, IDL, Figaro...) and revise script if needed.

# HET Information Flow Diagram



# Exposure Time Calculator (ETC)

Because the vignetting of the HET primary depends on the declination of the object, telescope azimuth, and starting time of the observation, a unique ETC for HET is needed to plan observations.

- User must specify RA/Dec of object
- Tool can supply or calculate optimal telescope azimuth and start time for a given position.
- Tool can predict times and S/N ratios or limiting times and ratios for maximum time available on object.
- Works in units of real time on object and time if there were no vignetting (the two time units that can be used when writing plans).

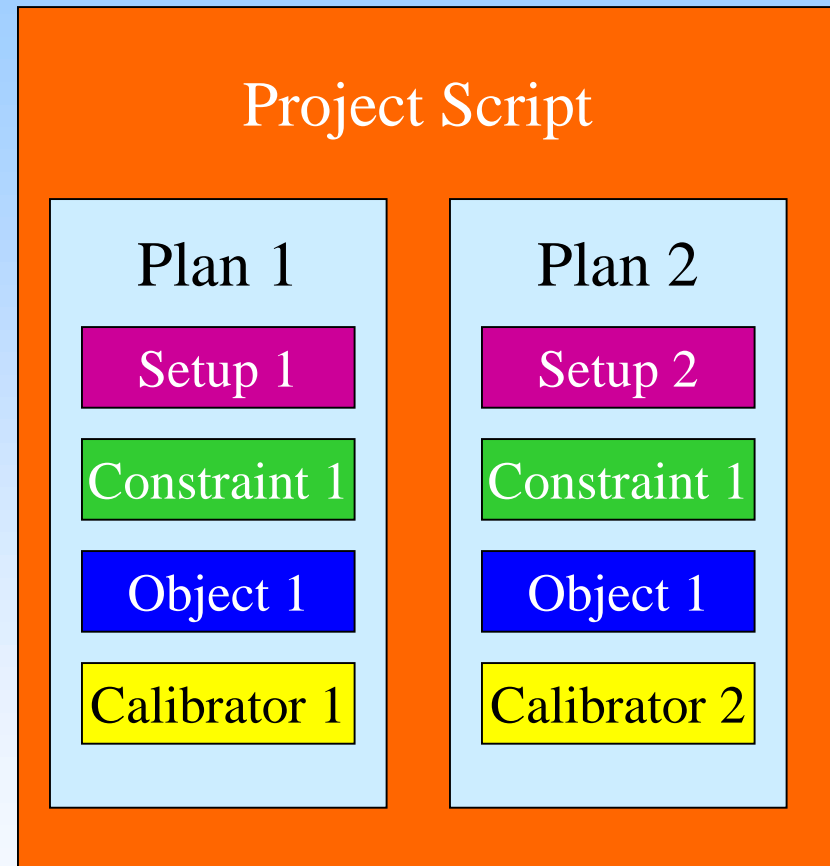
RA	+00:00:00.00	Instrument	LRS G2	
Dec	+65:00:00.00	Resolution	1300	
Lambda (A)	5500	Coadd	1	x 1
Sky (mags)	21.77	Seeing (arcsec)	1.5	
Sky defined by:	<input checked="" type="checkbox"/> Date <input type="checkbox"/> User			
	<input type="checkbox"/> Dark <input type="checkbox"/> Grey <input type="checkbox"/> Bright			
U. Date	23/11/1998	Opt. Az.	(E) 8.075	(W) 351.925
Best (E)	+22:37:39.84	Best LST	+22:37:39.85	+00:05:35.24
Mirrors	91	Earliest LST	+21:57:17.88	+23:25:13.27
Azimuth	8.075			
Give S/N and Flux				
Flux	23	Units	magnitudes	
S/N	10	Track Merit	0.90	
Time (unvignetted)	4604.9	Total Time On Object	5102.0	
Signal	Dark	Background	ReadNoise	
491	20	1197	26	e-/res element
Quit				

*Tool is used at all stages of planning, scheduling, and observing*

# Projects, Plans, and Phase II on the HET

Every project contains observing plans: each is defined as a sequence of actions on specified targets under acceptable conditions that result in fully calibratable data without any needed follow-up observations. Plans refer to objects, calibrators, instrument setups, and constraint conditions.

The HET Phase II language follows this abstraction. PIs create entries each describing an object, calibrator, setup, or constraint. Plans are built by sequencing entries and instrument exposures to describe how to acquire data sets. The PI of each project submits a script made up of plans and entries to describe all observations needed to reach the scientific goal.



The hierarchy of the HET Phase II language. Note that the entries shared by different plans need only be described once in the script.

# Describing and Sequencing Exposures

- Exposures can be specified in two ways:
  - Do: sequences the exposure in a script such that no other plans will be executed in the interim
    - + PI is in control of sequencing.
    - + All data is proprietary to this project.
    - + Any time spent idle between observations is billed to this project.
  - Schedule: tells the HET staff that an observation of this object is needed at some point in the night
    - + Typically used for calibration frames.
    - + Frames may be shared with other projects needing calibrations .
    - + Billed time is split between projects that share observations.
    - + Idle time is not charged to any project.
- PIs can request exposure times using unscaled time, which uses a fixed amount of clock time, or scaled time, which conserves the S/N of the exposure by scaling the time to accommodate variations in observing conditions such as seeing or transparency.

# Sequencing and Executing Observations

- Verified scripts are integrated into the HET Operational database.
- HET staff can browse this database using the tool *HTOP* which:
  - Prioritizes observations based on TAC rankings, time critical nature of observations, current and forecasted conditions, and status of the HET and its instruments.
  - Filters plans based on time of observation and other constraints such as limiting magnitude, project name, and telescope azimuth.
  - Can browse plans, objects, calibrators, and constraints for any plan.
- Selected plans are loaded into the plan execution tool *RUNPLAN*.
  - Displays important information for observer in simple format.
  - Will setup exposures on facility instruments, execute exposures, and log, backup, and distribute data as it is taken.
  - Keeps track of calibration frames and follow-up observations needed to finish all started plans.
  - Has planning tools built in to allow observer to determine what impact changes in plans or conditions will have on data.

# HTOP: Observation Database Browser

htop v 2.0 beta 1

File Schedule Info Search Selected Database: HET Projects Project Filtering is ON

@ Azimuth 35  Date 24/11/1998  @ UTime 2:15  Delta time 00:00:00 **UT & Date:** 17:04:26 24/11/1998

V faint 21  V bright 12  Min time 0:25 **Current LST:** 14:22:09 **Last Update** 16:58:43 24/11/1998

plan	object	ra	dec	equinox	v	priority	start	timeleft	az	transit	tst
chrisUT96016229570036	229570036	0:0:57.5	-5:1:1	B1950	14.43	0	+02:15:00.00	+01:07:10.57	180.0	+02:48:08.33	+02
chrisUT96016670-5	G70-5	0:41:51.0	-0:54	B1950	13.53	0	+02:15:00.00	+00:38:15.31	150.3	+02:23:11.10	+01
chrisUT9601663-11	G3-11	1:37:34.0	+9:15	B1950	13.53	0	+02:15:00.00	+00:40:35.13	120.8	+02:25:02.44	+01
chrisUT96016694-33	G94-33	2:5:20.0	+17:25	B1950	14.41	0	+02:15:00.00	+00:46:10.30	103.4	+02:29:24.59	+01
chrisUT96016674-10	G74-10	2:12:11.0	+32:10	B1950	12.59	0	+02:15:00.00	+00:36:09.38	76.1	+02:14:45.58	+01
chrisUT96016694-66	G94-66	2:23:7.0	+17:44	B1950	13.87	0	+02:15:00.00	+01:07:14.19	102.8	+02:46:28.88	+02
chrisUT96016636-32	G36-32	2:41:25.0	+27:28	B1950	13.71	0	+02:15:00.00	+01:11:48.58	84.5	+02:48:22.65	+02
chrisUT96016229570026	229570026	23:57:28.3	-4:23:48	B1950	13.16	0	+02:15:00.00	+00:43:50.01	173.0	+02:28:40.60	+01
chrisUT96016229570022	229570022	23:59:11.7	-6:6:27	B1950	17.74	0	+02:15:00.00	+01:04:57.00	100.0	+02:46:22.86	+02
d11UT96020G070-005	G070-005	00:41:51	-00:53.9	B1950						+02:23:10.25	+01
d11UT96020G003-009	G003-009	01:35:17	+10:04.7	B1950						+02:19:52.26	+01
d11UT96020G003-011	G003-011	01:37:34	+09:15.0	B1950						+02:25:02.44	+01
d11UT96020G094-033	G094-033	02:05:20	+17:25.1	B1950						+02:29:24.36	+01
d11UT96020G074-010	G074-010	02:12:11	+32:10.0	B1950						+02:14:45.58	+01
d11UT96020G004-016	G004-016	02:19:45	+17:44.0	B1950						+02:49:00.59	+02
d11UT96020G094-066	G094-066	02:23:07	+17:44.0	B1950						+02:46:27.99	+02
d11UT96020G036-032	G036-032	02:41:25	+27:28.0	B1950						+02:48:23.11	+02
d11UT96020G074-048	G074-048	02:54:55	+27:28.0	B1950						+02:55:22.35	+02
d11UT96020G242-060	G242-060	00:31:33	-00:53.9	B1950						+03:19:05.78	+02
d11UT96020G002-006	G002-006	00:54:06	-00:53.9	B1950						+02:18:55.40	+01
d11UT96020G002-037	G002-037	01:22:56	+10:04.7	B1950						+02:09:32.85	+01
d11UT96020G071-013	G071-013	01:27:57	+09:15.0	B1950						+02:24:46.26	+01
d11UT96020G002-044	G002-044	01:31:33	+10:04.7	B1950						+02:36:59.02	+01
d11UT96020G002-049	G002-049	01:33:47	+10:04.7	B1950						+02:36:51.56	+01
d11UT96020G003-012	G003-012	01:39:23	+09:15.0	B1950						+02:11:41.45	+01
d11UT96020G003-039	G003-039	02:01:52	+17:25.1	B1950						+02:38:29.17	+01
d11UT96020G035-028	G035-028	02:05:53	+27:28.0	B1950						+02:15:31.37	+01
d11UT96020G074-011	G074-011	02:12:33	+32:10.0	B1950						+02:14:12.89	+01

**Plan chrisUT96016G74-10**

id: chrisUT96016  
 instrument: inst  
 class: discretionary  
 do-object: G74-10 56 scaled 1

Get Info Dismiss

**G74-10 from chrisUT96016**

id chrisUT96016  
 name G74-10  
 comment  
 description star  
 ra 2:12:11.0  
 dec +32:10:  
 epoch  
 equinox B1950  
 pm\_ra  
 pm\_dec  
 ephemeris  
 a  
 e  
 i  
 t  
 p  
 big\_omega  
 little\_omega  
 rv

Dismiss

# RUNPLAN: Plan Execution Tool

Manual Plan Execution Tool
OBJECT Name  PLAN Name  UT

<b>Source Type</b> <input type="text" value="star"/>	<b>Inst.</b> <input type="text" value="ufoe"/>	<b>Astronomical Information Supplied by Observer (for now)</b> <b>Seeing</b> <input type="text" value="Unknown"/> <b>% Trans.</b> <input type="text" value="Unknown"/> <b>Sky (mags)</b> <input type="text" value="Unknown"/> <b>% Cloud cover</b> <input type="text" value="Unknown"/> <b>Mirror count</b> <input type="text" value="Unknown"/> <b>Position Angle</b> <input type="text" value="Unknown"/> <b>Lamp</b> <input type="text" value="Unknown"/>	<b>Abstract:</b> we propose to gather medium-resolution ufoe spectra of about 150 ultra-metal-poor galactic halo stars, those with [Fe/H] < -2.5. we will use these spectra (obtained with r and wavelength range 4500--8000) to search for abundance anomalies in individual halo stars of similar overall Fe metallicity. such anomalies will be apparent from the variations in the relative absorption strengths of key spectral features (scattered throughout the large spectral range covered in a ufoe integration) of several elements. the abundance anomalies of these stars are the direct records of (unmixed) ISM gas of the very early galactic halo. the ranges of the abundance anomalies will lead to a detailed description of the first generation of element donors in our galaxy. this will be the very first large-sample survey of ultra-metal-poor stars, and can be done with very short
<b>RA</b> <input type="text" value="2:12:11.0"/>	<b>Grating</b> <input type="text" value="79"/>		
<b>Dec</b> <input type="text" value="+32:10:"/>	<b>Fiber</b> <input type="text" value="single_fiber"/>		
<b>Equinox</b> <input type="text" value="B1950"/>	<b>itime</b> <input type="text" value="56"/>		
<b>V</b> <input type="text" value="12.590"/>	<b>itype</b> <input type="text" value="scaled"/>		
<b>PA</b> <input type="text"/>	<b>Num Exp</b> <input type="text" value="1"/>		
<b>Finding Chart</b> <input type="text"/>	<b>Req. Azimuth</b> <input type="text"/>		
<input type="button" value="Display Finding Chart"/>	<input type="button" value="Setup Instrument"/>		

<input type="button" value="Send Position"/>	<input type="button" value="Start Exposing"/>	<input type="button" value="Set Az"/>	<input type="button" value="Restart Plan"/>
<b>Current RA</b> <input type="text"/>	<b>Telescope Az</b> <input type="text"/>	<input type="button" value="Next Object"/>	<input type="button" value="View Plan"/>
<b>Current Dec</b> <input type="text"/>	<b>Telescope HA</b> <input type="text"/>		
<b>Equinox</b> <input type="text"/>	<b>Airmass</b> <input type="text"/>		
<b>LST</b> <input type="text"/>	<input type="button" value="Restart TCScomm"/>		

<b>Comments:</b>	<input type="button" value="Source"/>	<input type="button" value="Constraint"/>	<input type="button" value="Instrument"/>	<input type="button" value="Plan"/>
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<b>Queued Observations</b>	
<input type="button" value="Obs. Done"/>	
<input type="button" value="Combine Obs"/>	
<input type="button" value="Clear Queue"/>	

<b>Event Logging (Manual events):</b>	<input type="button" value="Started Plan"/>	<input type="button" value="Start Acquisition"/>	<input type="button" value="Object Acquired"/>	<input type="button" value="Script Started"/>	<input type="button" value="Data Approved"/>
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17:23:50 22/23/98 Runplan started  
 17:23:52 22/23/98 Note: New instrument setup

<input type="button" value="Load New Plan"/>	<input type="button" value="Enter Comment"/>	<input type="button" value="Preferences"/>	<input type="button" value="Manual Operation"/>	<input type="button" value="SN Calculator"/>	<input type="button" value="Dismiss"/>
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# HET Queue Sequencer

During early operations we will extend our work in sequencing observations as conditions change in real time. At the start of a night, we plan to create sequences for the night for the different conditions that may be encountered: Priority 1 (critical observations to be done if at all possible), Highest Priority, Faint Objects (highest priority under good conditions) and bright objects (highest priority under poor conditions). We are currently developing software to pre-select, manipulate, and execute these sequence.



The screenshot shows a window titled "queues" with a table of observation sequences. The table has five columns: Universal Time, Priority 1, Highest Priority, Faint Object, and Bright Object. The rows show a sequence of observations over time, with each row containing a time stamp and a list of observation identifiers for each priority level. At the bottom of the window, there is a status bar showing the database path and three buttons: Set DB, Print, and Dismiss.

Universal Time	Priority 1	Highest Priority	Faint Object	Bright Object
+00:00:00.00	diluT96020G020-019.plan.db G020-	charltonPS9602419.plan.db Q1704+7	charltonPS9602419.plan.db Q1704+7	oroszPS96012K3IVstd1.plan.db
+00:15:00.00	elrUT96007WD1940+374.plan.db WD	charltonPS9602419.plan.db Q1704+7	charltonPS9602419.plan.db Q1704+7	oroszPS96012K0IVstd1.plan.db
+00:30:00.00	elrUT96007WD1940+374.plan.db WD	charltonPS9602419.plan.db Q1704+7	charltonPS9602419.plan.db Q1704+7	oroszPS96012K2Vstd1.plan.db
+00:45:00.00	elrUT96007WD1940+374.plan.db WD	charltonPS9602419.plan.db Q1704+7	charltonPS9602419.plan.db Q1704+7	oroszPS96012K2Vstd1.plan.db
+01:00:00.00	ringwaldPS96021NGC-6996_M4.plan	chrisUT96016G154-37.plan.db G154-	charltonPS9602419.plan.db Q1704+7	oroszPS96012K2Vstd1.plan.db
+01:15:00.00	fritzUT96017M2.plan.db GJ748	charltonPS9602419.plan.db Q1704+7	charltonPS9602419.plan.db Q1704+7	oroszPS96012K2Vstd1.plan.db
+01:30:00.00	fritzUT96017M2.plan.db GJ748	charltonPS9602419.plan.db Q1704+7	charltonPS9602419.plan.db Q1704+7	oroszPS96012G7IVstd1.plan.db
+01:45:00.00	artieUT96003P_SSCYG.plan.db SS_C	ringwaldPS96021NSV-1321_M3.plan	wadePS96013FGL.plan.db A72	acarknerPS96010P27.plan.db
+02:00:00.00	artieUT96003P_SSCYG.plan.db SS_C	ringwaldPS96021NSV-1321_M3.plan	wadePS96013FGL.plan.db A72	acarknerPS96010P27.plan.db
+02:15:00.00	acarknerPS96010P15.plan.db k15	acarknerPS96010P26.plan.db k26	mabPS960071647.4743.plan.db 1647.	acarknerPS96010P1.plan.db k
+02:30:00.00	andersenPS96031309625.plan.db 309	mabPS96006217415.plan.db 217415	mabPS96006217415.plan.db 217415	acarknerPS96010P1.plan.db k
+02:45:00.00	andersenPS96031309625.plan.db 309	mabPS96006217415.plan.db 217415	mabPS96006217415.plan.db 217415	acarknerPS96010P1.plan.db k
+03:00:00.00	lwrPS96001Plan_UVPsc.plan.db UVP	mabPS96006217415.plan.db 217415	mabPS96006217415.plan.db 217415	acarknerPS96010P1.plan.db k
+03:15:00.00	andersenPS96031309625.plan.db 309	mabPS96006217415.plan.db 217415	mabPS96006217415.plan.db 217415	acarknerPS96010P1.plan.db k
+03:30:00.00	andersenPS96031309625.plan.db 309	mabPS96006217415.plan.db 217415	mabPS96006217415.plan.db 217415	acarknerPS96010P2.plan.db k
+03:45:00.00	andersenPS96031309625.plan.db 309	mabPS96006217415.plan.db 217415	mabPS96006217415.plan.db 217415	acarknerPS96010P3.plan.db k
+04:00:00.00	andersenPS96031309625.plan.db 309	mabPS96006217415.plan.db 217415	mabPS96006217415.plan.db 217415	acarknerPS96010P7.plan.db k
+04:15:00.00	elrUT96007WD2129+000.plan.db WD	mabPS96006217415.plan.db 217415	mabPS96006217415.plan.db 217415	acarknerPS96010P12.plan.db
+04:30:00.00	elrUT96007WD2130-047.plan.db WD	oroszPS96014do_V630_Cas.plan.db	oroszPS96014do_V630_Cas.plan.db	acarknerPS96010P19.plan.db
+04:45:00.00	elrUT96007WD2130-047.plan.db WD	charltonPS9602318.plan.db BR2235-	charltonPS9602318.plan.db BR2235-	acarknerPS96010P22.plan.db

Database: /opt/HET/db/plan.db

Set DB Print Dismiss

# Individual Project Web Pages

Each project has a password protected private web page. These pages allow PIs to examine the information we currently have from them (plans and finding charts) and retrieve recently acquired data.

Future upgrade will allow users to retrieve all data unretrieved data in a single archive as well as check on status of current plans.

