Interacting with the HET queue

Mark E. Correll (McDonald Observatory)
Niall I. Ga衍ey (HET)
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).
Hobby Eberly Telescope

HET Operations Home Page

Welcome to the Hobby Eberly Telescope Operations homepage. This page is intended for the use by investigators who are applying for and using observing time on the telescope. For more general information, please visit the McDonald Observatory HET web pages.

To the left is a navigation bar leading to the information contained within these pages. This information includes:

1. Information about the current status of the telescope.
2. A near term schedule for activity at the telescope.
3. Planning and Scheduling software for the HET.
4. A list of the current projects and information about each.
5. Links to the data pages for the current investigators (HET data account required).

Investigators applying for or using US National Access Time should use the NCAO HET website for their projects.
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.
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).

**Tool is used at all stages of planning, scheduling, and observing**
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
RUNPLAN: Plan Execution Tool

Abstract:

We propose to gather medium-resolution uoce spectra of about 150 ultra-metal-poor galactic halo stars, those with [Fe/H] $\leq -2.5$, using the spectra obtained with [Fe/H] $\leq -2.5$, we will use these spectra (obtained with $\lambda$ and wavelength range 4500--6800) to examine anomalies in individual halo stars of similar overall Fe metallicity. Such anomalies will be apparent in the variations in the relative absorption strength of key spectral features (scattered throughout the large spectral range covered in a uoce 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-scale survey of ultra-metal-poor stars, and, can be done with very short any instrument setup is fine as long as it is at the highest resolution possible. Do not bother moving the grating angle if this is an option. We will take whatever wavelength region we can get.

Queued Observations

- Obs. Done
- Combine Obs
- Clear Queue

Event Logging (Manual events):

- Started Plan
- Start Acquisition
- Object Acquired
- Script Started
- Data Approved

17:23:50 22/23/98 Runplan started
17:23:52 22/23/98 Note: New instrument setup
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.
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.