Yale Astronomy Resources

August 28, 2014

Outline

- Computing + HPC facilities
- Library Resources

- Update on telescope access
- Proposal guidelines and deadlines
- Keck
- Palomar
- NOAO 4-meters
- SMARTS
- Common TAC Comments

- Yale-Chile program
- SDSS3+4

Computer Resources for Astronomy

Departmental resources

- Centralized disc space divided into home directories (home, 40 GB), and research areas (/net)
- Each faculty member has a /net area. Everybody working under a faculty member has an area under the corresponding research area.
- /home backed up daily
- /net backed up a few times a week

- 2 fast compute nodes, each with 16 processors for heavy duty computing (esca and rgot).
- 3 older nodes, with 8 processors (turtle, tortoise, terrapin)
- Software licenses: Intel compilers, IDL etc.
- Some research groups have their own systems too (e.g., van Dokkum, Fischer, Basu, Sofia).

Computer Resources for Astronomy

University resources

- Several clusters (Bulldog L, Omega and Gracie)
  - see http://hpc.research.yale.edu/wiki/index.php
  - Every faculty member can get a queue and people working with the faculty submit jobs under that queue.
  - The queuing system is a bit of an issue, being worked on right now.
- Archival Storage available, talk to Craig about RSS system on West Campus.

Library Updates

SERVICES

- Course Reserves – look in Classes*v2's left panel
- Borrowing privileges announcement soon!
- Data Management Planning Tool: https://dmptool.org
- Subject Guide Updates: http://guides.library.yale.edu/astro
- New Guide for Non-science Majors: http://guides.library.yale.edu/nonscientistagp
- Drop-in hours: Thursdays, 4 PM, JWG 2nd floor foyer
- ADS's new interface now has a tab for a more "classic" version: http://adslabs.org/adsabs/search/classic-search

RESERVABLE SPACES AT CSSSI

(http://schedule.yale.edu/booking/csssi)

- Media:scape rooms (group study &c.)
- Presentation practice & conference call rooms

Update on Telescope Access

- 10 Keck nights per semester
- We have a 1/8 share of the Palomar 200-inch (~22 nights per semester)
- Yale is a full institutional member of SDSS4
- Through a special arrangement with NOAO, Yale will have the following 4-meter access:
  - 2015A-2016A = 5 Mayall/SOAR
  - 2015A, 2016A = 5 Blanco

Submitting Proposals

- Anyone with a Yale affiliation can apply for 4-meters and SMARTS
- Postdocs and faculty can apply for Keck time
- Proposal deadlines early - driven by Keck/Caltech **[Sept 19 for 2015A]**
- Pre-proposals for Keck and 4-meters due 1 week before proposal deadline **[Sept 12 for 2015A]**
- Pre-proposals allow one to gauge balance and oversubscription
- Information/forms at: http://dev.astro.yale.edu/facilities/yale-time-allocation-committee

Submitting Proposals

New this semester

All Keck, Palomar and NOAO proposals must also submit formal coversheets appropriate to each facility.

Coversheets can be filled out at the respective telescope's website and appended to your proposal. See TAC website or proposal announce email for links.

FACILITIES

Facilities Home

Yale-NASA Keck Remote Observing Facility

Yale Time Allocation Committee

- Facility Information for Yale Proposers
- Proposal Abstracts for Projects Awarded Time by Yale TAC

Leitner Family Observatory and Planetarium

Astronomy Library

Facility Information for Yale Proposers

Keck

We have 20 nights per year (10 nights per semester) through our agreements with CalTech and Keck. These nights must be balanced between Keck I/II as well as moon phase, and should be distributed equitably across the semester. There are also up to 5 nights per year available for collaborative projects between CalTech and Yale. Such projects have a CalTech PI, and are submitted through the CalTech TAC.

For 15A we have the following *suggested* allocation:

- KI: 1 dark, 1 grey, 2 bright + 1 night Yale allocation (grey)
- KII: 1 dark, 1 grey, 2 bright + 2 nights Yale allocation (1 bright, 1 dark)

Please note that Keck proposals must be for full nights; proposals for half nights are not permitted.

Yale Keck time is open to faculty and postdocs. **Postdocs are particularly encouraged to apply for Keck time.**

Further information on available Keck instruments, etc. can be found on the Keck website.

Blanco / Mayall / SOAR

Keck Telescopes

- Twin 10-meter telescopes located on Mauna Kea, Big Island of Hawaii.
- Yale has 20 nights per year, shared over both telescopes/moon phase.
- Faculty and postdocs are allowed to lead observing proposals.
- Remote observing facility is available at Yale for experienced observers. For more info, see http://www.astro.yale.edu/keckro/.

  - For 2015A: **K1:** 1 dark, 2 grey 2 bright
  - **K2:** 2 dark , 1 grey, 3 bright

Keck Telescopes

Current Instruments: HIRES, LRIS, OSIRIS, DEIMOS, ESI, NIRC2, NIRSPEC, LGS-AO, MOSFIRE

Keck Observatory Archive (KOA): HIRES, NIRSPEC, NIRC2 are available. LRIS, DEIMOS, ESI, MOSFIRE available to PIs.

For up to date info: http://www2.keck.hawaii.edu/observing/instavail.html

Keck Telescopes

Future Instruments: NIRES is scheduled for delivery in 2014B.

While we anticipate that NIRES will be available on Keck II for shared risk during 2015A, all NIRES proposals should be submitted with a backup NIRSPEC or NIRC2 NGS program.

For up to date info: http://www2.keck.hawaii.edu/observing/instavail.html

Palomar 200-inch

- Yale has a 1/8 share of science time available on the 200-inch Hale Telescope at the Palomar Observatory.

- This equates to ~45 nights per year balanced across moon phases. For 15B there are 21 nights available for Yale proposers.

Palomar 200-inch

Palomar instrumentation

Double Spec: Optical single slit spectrograph (3000A - 1.1um)

Triple Spec: IR spectrograph (simultaneous JHK)

WIRC: IR imager 10' FOV (good pipeline redux)

LRC: optical imager 24' FOV, but poor focus at field edge

CWI: 1' FOV, R = 5000 (semi-private)

PHARO, SWIFT, P1640

NOAO Time Trade

- Through a special agreement with NOAO, we have 4-meter time available. These nights need to balance over moon phase:
  - 2014A-2016A = 5 Mayall or SOAR
  - 2015A, 2016A = 5 Blanco

Mayall instruments: NEWFIRM, MOSAIC, KOSMOS

SOAR instruments: optical/IR imagers ~5' FOV, but high spatial res single-slit and IFUs.

SMARTS

The SMARTS3 Consortium is continuing to operate small telescopes at CTIO:

- Georgia State University (GSU) manages the 0.9m in user mode only.
- Yale operates the 1.3m and 1.5 meters in queue/service mode only.
- The 1.0m is closed.

Yale PIs can propose for the 1.3m and the 1.5m through Yale.

*Anyone with funding can purchase time on the 0.9m through GSU ($600/night) or more time on the 1.3m and 1.5m ($200 per hour) through Yale. Please see Victoria Misenti for more info.

There are 238 hours of SMARTs time available to Yale users in 2015A.

***** Please submit time in hours, not nights.**

INSTRUMENTS:

- 1.5m – Chiron (high-res spectrograph)
- 1.3m – ANDICAM (optical/IR imager)

Preparing Proposals

- To better prepare proposals, below are a list of commonly repeated comments from the Yale TAC.
  - Justification for choosing this telescope over others for the project.
  - If time has been previously awarded time, what is the status of the data? Has the data been reduced? Timeline to a paper?
  - Especially when there are non-Yale CoIs, the TAC would like to see a description of what the CoIs role in the program.
  - Keep the science justification under one page. Make sure that the number of nights requested in the "grid" is the same requested in the proposal text.
  - Explicitly justify the amount of time requested (e.g. why 4 nights vs. 2?)
  - Especially if for continuing programs, explain why more data will be an improvement. What is required to answer the science question?

Yale-U. de Chile Joint Program in Astronomy Research & Education

A multi-faceted program

- Joint Research Programs (JRPs)
- Grad Student “exchange”
- Postdocs (associated with JRPs)
- Faculty sabbaticals
- Access to Chilean telescopes -- thru JRPs or living in Chile for 8 months
- Undergraduate summer course at U. de Chile

Altiplano de Chajnantor
- **APEX (12-m)** – **MPIfR /ESO/OSO**
- **ALMA (54 12-m + 12 7-m antennas)-ALMA Obsv. (ESO/NAOJ/NRAO)**
- **ASTE (10-m)** – **NAOJ + other Japanese institutes**
- **NANTEN2 (4-m)** – **NANTEN Submillimeter Observatory (various institutes)**

Cerro Armazones – Observatorio Cerro Armazones
- **14-cm** – OCA
- **84-cm** – OCA
- **Hexapod Telescope 1.5-m** – OCA
- **E-ELT** (42-m in construction) – ESO

Cerro Paranal – La Silla Paranal Observatory
- **Antu** (8.2-m) – ESO (VLT)
- **Kueyen** (8.2-m) – ESO (VLT)
- **Melipal** (8.2-m) – ESO (VLT)
- **Yepun** (8.2-m) – ESO (VLT)
- **Vista** (4.0-m)

Las Campanas – Las Campanas Observatory (Carnegie Intitution for Sciencie)
- **Walter Baade** (6.5-m) – Magellan Telescope
- **Landon Clay** (6.5-m) – Magellan Telescope
- **du Pont** (2.5-m)
- **Henrietta Swope** (1.0-m)

Cerro La Silla – La Silla Paranal Observatory
- **"360"** (3.6m) – (ESO)
- **NTT** New Technology Telescope (3.5m)- ESO
- **Max-Planck Telescope** (2.2m) -ESO
- **1.2-m** Swiss Telescope
- **1.5-m** Danish Telescope

Cerro Tololo – Cerro Tololo Inter American Observatory
- **Blanco** (4.0m) – CTIO/NOAO
- **1.5-m** -SMARTS
- **1.3-m** -SMARTS
- **1.0-m** -SMARTS
- **0.9-m** -SMARTS

Cerro Pachón
- **Gemini South** (8.1m) -CTIO/NOAO
- **SOAR (4.2m)** -CTIO/NOAO

Cerro Peñón
- Future site of **LSST**

Connecticut Space Grant Consortium

The Connecticut Space Grant Consortium is a NASA funded organization made up of 16 affiliated universities and community colleges in the state of Connecticut.

CT Space Grant funds undergraduate, graduate, and faculty STEM related projects, research, travel, internships and workshops by offering scholarships, fellowships, and grants.

Student Awards

Award	Award Amount
Graduate Research Fellowship	$20,000
Undergraduate Research Fellowship	$5,000
Industrial Internship	$6,000
Student Project	Up to $1,000
Travel Award	Up to $1,000
Capstone/Senior Design Project	Up to $3,000

Faculty Awards

Award	Award Amount
Faculty Research Grant	$20,000
Faculty Seed Research Grant	$6,000
Collaboration Grant	$7,500
Curriculum Development Grant	$7,500
STEM Education Research Grant	$7,500
Faculty Travel Grant	Up to $1,000

Next deadline: Friday October 10, 2014 at 2PM

SLOAN DIGITAL SKY SURVEY @YALE

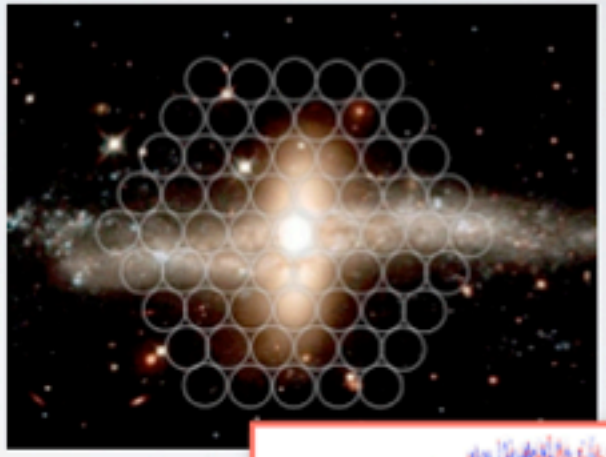
www.sdss.org

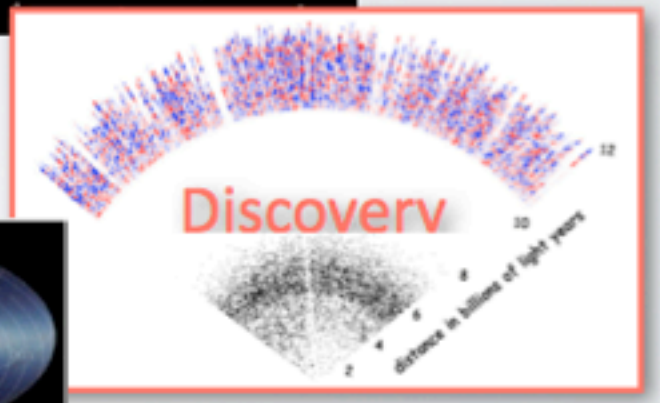
- **Yale is a full member institution in SDSS-III and IV!**
  - Faculty, staff, students have access to pre-release data.
  - All are welcome to help with planning, analysis, and science.
- **Wiki and mailing lists:** https://trac.sdss.org
  - Mailing lists for everyone: sdss3-general, sdss4-general
- **Ask us questions:**
  - John Parejko (john.parejko@yale.edu), JWG 465
  - Nikhil Padmanabhan (nikhil.padmanabhan@yale.edu), JWG 451
  - Hector Arce (hector.arce@yale.edu), JWG 268

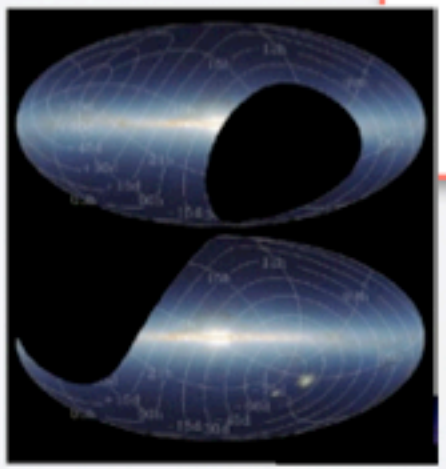
SDSS

SDSS IV, THROUGH 2020

- **MaNGA**
  - 2D spectra of 10,000 galaxies!
- **eBOSS**
  - quasars z<3.5, galaxies z<1.5
  - time domain spectroscopy
- **APOGEE-2**
  - +Southern Hemisphere
  - half-million stars

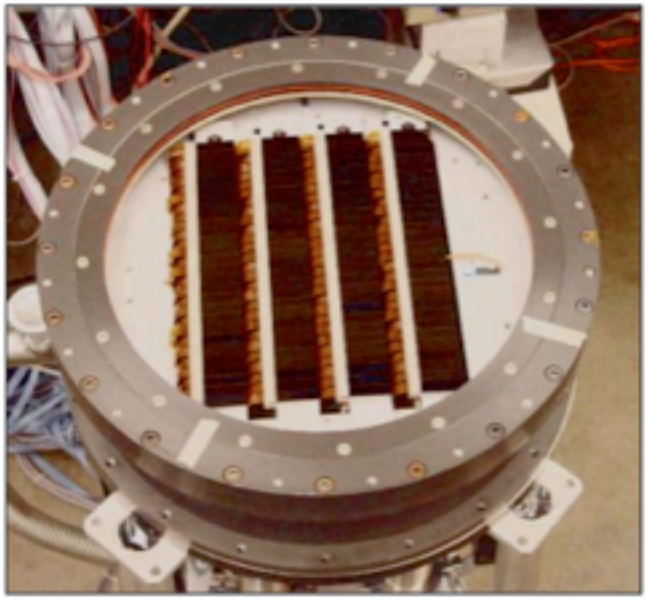






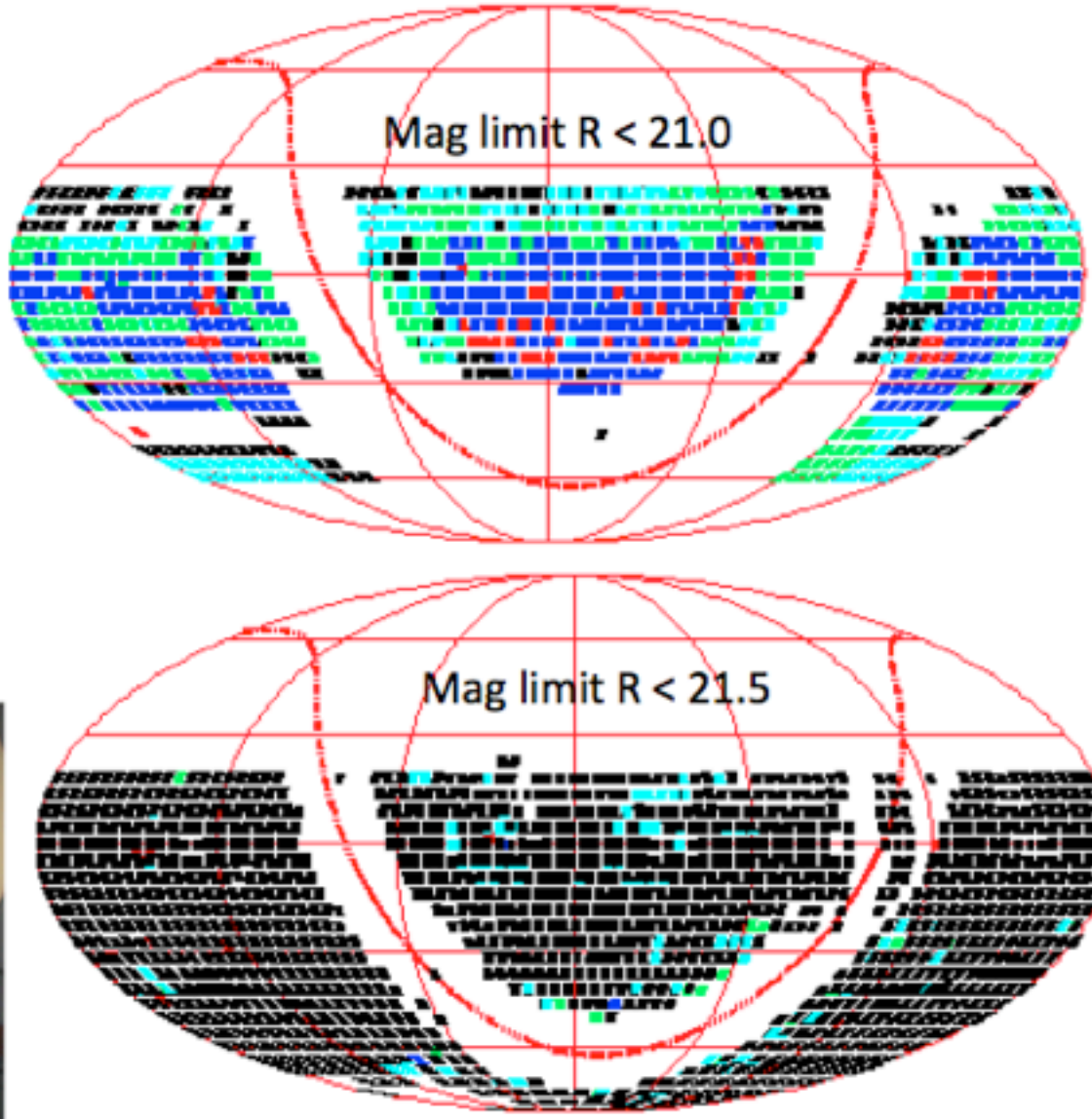
SDSS

La Silla QUEST Survey area : 2010-2014

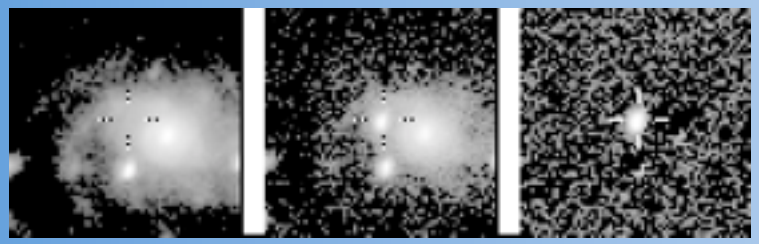


Yale's 160-Mpixel QUEST camera

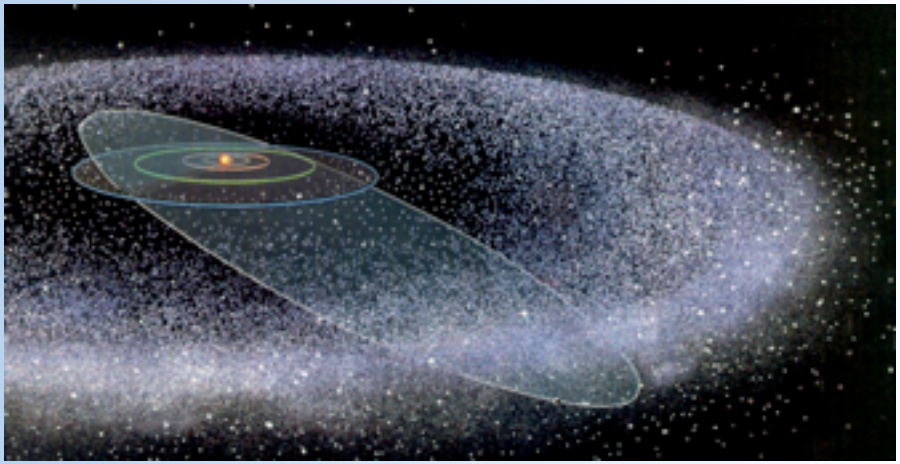
ESO 1.0-m Schmidt at La Silla, Chile



Recent Results from LSQ

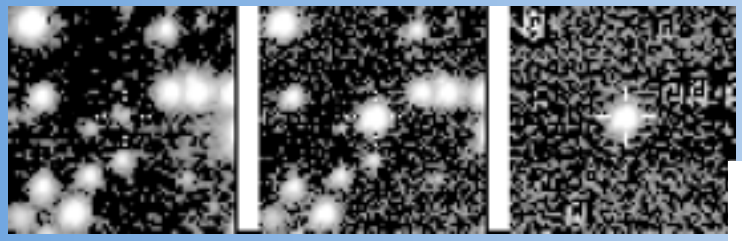


100s of Supernovae

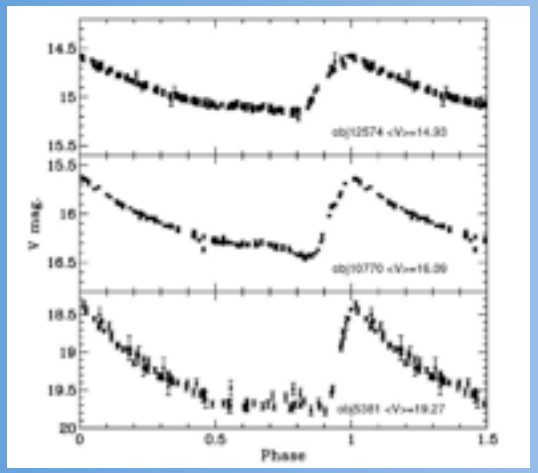


>100 Trans-Neptunian Objects

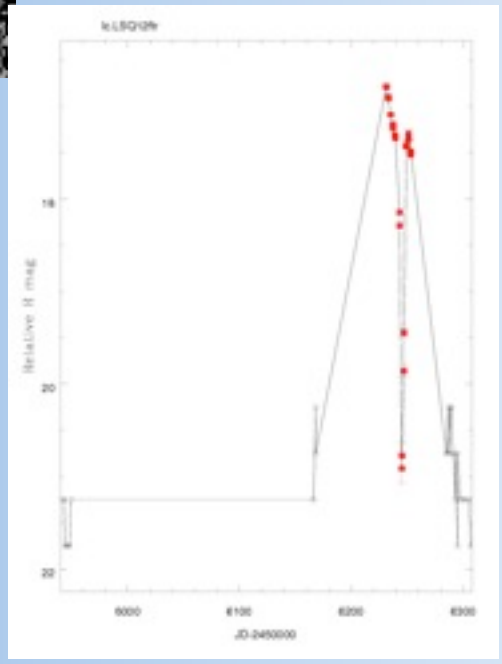
Micro-lensing Events

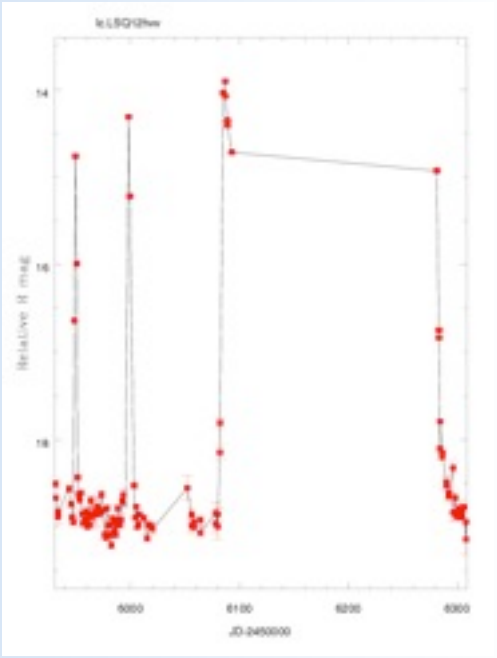


1000s of RR Lyrae



weird variables





For More Information...

- Proposal guidelines and deadlines: Victoria Misenti
- Keck: Marla Geha, Debra Fischer, Pieter van Dokkum
- Palomar: Pieter van Dokkum, Marla Geha
- NOAO: Victoria Misenti, Marla Geha
- SMARTS: Victoria Misenti, Charles Bailyn
- Yale-Chile: Jeff Kenney
- SDSS3/4: Nikhil Padmanabhan, John Parejko
- QUEST: Charlie Baltay, David Rabinowitz
- HPC: Sarbani Basu

General Telescope questions: Marla Geha
General Computing questions: Sarbani Basu

Summary

As a member of the Yale Astronomy department, you have access to world-class observing and computing resources.

Go use them !