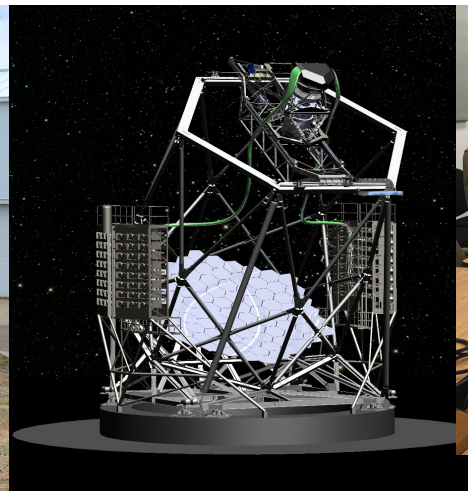


Astronomy Department Strategic Initiatives & Outlook

Shardha Jogee, Department Chair



Outline

- Overview of the UT Astronomy Program
- UT Astronomy Ranking and Strategic Priorities
- Opportunities for Faculty Hires over 2016-2020 (with Chris Sneden)
- Graduate Program & Student Support
- UG and Postdoctoral Program
- Faculty/Res Staff Engagement in GMT
- Fundraising and Alumni Relations (with Keary Kinch)
- Public Relations and Visibility in 21st Century

Open Discussion (+ Follow-up Open Discussion in Session IV)

Overview of the UT Astronomy Program

- Top-tier astronomy program leading frontier research in cosmology, galaxy evolution, star formation, stars, exoplanetary systems, the Solar system, instrumentation.
- Associated with McDonald Observatory, hosting cutting-edge telescopes & instrumentation
- Federal grants: ~ 5 M/year
- Contribute to UT Austin's 2015 ranking in space science as and 10th worldwide and 4th among US public Universities (US News & World Report)
- One of the largest premier UG & graduate astronomy programs in the nation
- Major founding partner in the Giant Magellan Telescope
- Access to TACC, operating some of world's most powerful computing resources
- Far-reaching STEM education and outreach program
 - Engage 4,000+ non-science UG majors & 100,000 K-12 students each year
 - 83,000 visit the McDonald Observatory Visitor Center each year
 - 2.3 million listeners tune in weekly to StarDate Radio

UT Astronomy Ranking and Strategic Priorities

| Global Ranking In Space Science |
|------------------------------------|
| 1. Caltech |
| 2. Harvard |
| 3. UC Berkeley |
| 4. UC Santa Cruz |
| 5. Princeton |
| 6. U. Arizona |
| 7. Yale |
| 8. U. Chicago |
| 9. U. Cambridge |
| 10. UT Austin |
| 11. U. Toronto |
| 12. Stanford |
| 13. Oxford |
| 14. OSU |

UT Astronomy contributes to UT Austin's ranking in space **science as 4th among US public universities and 10th worldwide** (US News & Report 2015)

Strategic Priorities

- 1) Recruit, support, retain intellectual leaders (faculty, students, researchers)
- 2) Access to top-tier research facilities (e.g., McD, TACC, GMT, others?)
- 3) Growing STEM leaders in our UG, graduate, and postdoctoral program
- 4) Advance philanthropy, alumni relations, and visibility of UT Astronomy
- 5) Promote a climate of excellence, innovation, and inclusion
- 6) What else?

Blue/Grey= US public/private

Opportunities for Faculty Hires over 2016-2020

Honoring Neal Evans and David Lambert

- Neal and David retired in Aug. 2016 after 41/47 distinguished years of research and service.



Formation of stars
and proto-planetary disks



Stellar abundance and chemical
evolution of the Milky Way

- They will continue their engagement with the program via research and mentoring
- Reception to honor Neal and David later this Fall
- Senior BC meeting in Oct. to discuss use of Harte Chair & Randall professorship

4-Year Projection of Faculty Retirements & Hires

- As of 2014, we have 24 faculty with 22 on Ins. Budget + 2 Research Professors
- Expect wave of retirement over 2016-2020, with at least 7 (32%) of faculty on IB retiring.

Table 1: Number of Faculty on Instructional Budget

| AY | N-Hire | N-Retired | N-Total |
|-----------|---------------|------------------|----------------|
| 2014-15 | 0 | 0 | 22 |
| 2015-16 | 2 | -0.5 | 23.5 |
| 2016-17 | 0 | -4 | 19.5 |
| 2017-18 | 2 | 0 | 21.5 |
| 2018-19 | X | -2.5 to -3.5 | 18-19 + X |

- When faculty on IB retire, faculty slots go back into CNS pool. We negotiate with Dean each year on plan to keep number of astronomy faculty on IB at ~22.
- For 2017-18, astronomy request for 2 hires approved (after budget and signed ret. letters)
- Will negotiate for 1-2 new hires per year for next two years.

Improving Diversity and Inclusion at All Levels

Progress in including under-represented groups at Graduate & UG level, but not at faculty level

| Group | Yr | Total # | Gender | | | Racial Ethnicity | | | | | |
|---------|------|---------|--------|-------|----|------------------|-------------|-------------|-------|-------|---------------------|
| | | | M | F | O | W | B/AA | H | A | Nat-A | O |
| UG | 2016 | 129 | 64.4% | 35.7% | 0% | 51.94% | 2.3% | 5.4% | 10.8% | 0% | 29.5% (23% mul) |
| Grad St | 2016 | 35 | 68.6% | 31.4% | 0% | 57.1% | 5.7% (2) | 8.6% (3) | 2.9% | 0% | 25.7% (5.7% mul) |
| Faculty | 2016 | 22 | 83.4% | 13.6% | 0% | 91% | 0% | 0% | 9% | 0% | 0% |

Need to broaden faculty **applicant pool** and reach out to good URM candidates before Dec 1
 2012-13: 177 applicants, (140 M + 37 F), only 3H + 1B
 2014-15: 164 applicants (118 M + 46 F), only 3H + 4B

5 diversity hiring lines available in CNS. Send application of good candidate to Dean.

How to Get the Most of our Faculty Hiring Opportunities

- Hire the "Best" irrespective of field?
- Hire in frontier Areas for GMT ?
 - Stellar Archeology as Near-Field probe of Galaxy Assembly (?)
 - Formation of Stars and Planets
 - Exoplanetary Systems (?)
 - Dark Matter, Dark Energy
 - First Stars, First Galaxies, Reionization
 - Low Mass/First Black Holes
 - Transient Phenomena (?)
 - Expertise in LSST with synergy of LSST (2022) and GMT (2023+).
- Expertise in LIGO ?
- Interdisciplinary hire?
 - Astronomy +Computer Science or Statistics: Big Data
 - Astronomy + Geology: Planetary science
 - Astronomy + Biology: Astrobiology
- Improve Diversity
- Junior vs Mid-caree/Senior hires?

| Global Ranking In Space Science |
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Blue/Grey= US public/private

Graduate Program & Student Support

2016: Seven Graduate Students on NSF and CNS/GS Fellowships

Sinclair
Manning

Star Formation



Jonathan
Florez

Galaxy Evolution



Aaron
Smith

First Galaxies



Jessica
Luna

Instrumentation
& Exoplanets



4 NSF: Jessica Luna & Sinclair Manning Jonathan Florez and Aaron Smith.

2 GS Continuing Fellowships: Wenbin Lu, Emma Yu

1 Dean Strategic Fellowship: Caprice Phillips

New Graduate Support Model for Astronomy as of AY 2015-16

- 1) Before 2014, Astronomy typically received CNS/Grad School funds of **\$54 K /year** for support.
Following 2014 Provost Initiative **Astronomy funds reduced to zero in 2015**
- 2) In Nov 2014, Department negotiated a new deal with CNS, effective AY 2015-16
 - A) CNS/GS chip in
 - CNS/GS provides recurring funds of \$38 K
 - CNS provides 5-year bridge from 2015 to 2019: \$ 52K, 39K, 22K, 17K, 12K
 - B) Department agrees to
 - Department provides recurring Cox funds of \$50 K/yr
 - GRA rate rises by 30% from 24 K/yr to 28 K/yr to be competitive with peer institutions
 - Average Admission Rate = 6 per year
 - Students guaranteed 5-year of support (vs earlier deal of 1 year of guaranteed support)
 - Aim at average graduation time ~ 5.2 years
- 3) CNS raised TA rate by 41% to 24 K/yr . Advisor must provide gap to make TA rate match GRA rate
While a TA previously free, it now costs the advisor \$1,746 per long semester TA

This support model assumes we have a large number of TAs from service courses

How to Maintain Service Courses & TA allocation over 2016-2020?

- Service courses (AST 301, 309) important for
 - Reaching ~4000 non-science majors each year (Provost, Legislature, BoV)
 - Providing TA support for grad students
 - Meeting 75% rule
- CNS rule: allows only TT faculty can teach service courses in Fall & Spring. Faculty retirement and leaves for TT faculty in 2016-17 led to expectations:
 - Number of service courses taught by TT faculty expected to drop from 20 to 12
 - Expected TA drop = 43 → 27
 - 1) Astronomy submitted a plan to CNS to request exception to CNS rule
 - Plan (finally) approved for 2016-17 for up to 5 NTT to teach.
 - Thanks to Mike Endl, Judit Ries, and Keely Finkelstein for teaching in 2016-17
 - 2) In Aug 2016, AST 309 enrollment doubled from ~100 to 200+, adding 6 extra TAs
- In 2016-17 combination of 1) + 2) allowed us to maintain TA allocation at 43
- For next 3 years: **If you plan to retire please let me know at least a year ahead** so we can negotiate with CNS to keep reaching ~4000 UGs and maintain decent CNS TA allocation

Are we efficiently using our TA slots for graduate student support?

- Number of TA slots used by Astro students has dropped sharply over 3 years: **38** → **27** → **14**
- This is **not due** to having fewer astro students, or more external/GS fellowships

| AY | Service Courses taught by TT faculty | Service Courses Taught by NTT staff | No of TAs given by CNS/UT | Astro TAs | External TAs | Total Astro Grad. Students | Grad Students On External or GSc or dean Full-Year Fellowships | New Students Enrolled | TT Fac/Res Prof Supervising Grad Students As main or co-advisors | |
|---------|--------------------------------------|-------------------------------------|---------------------------|--------------|---------------|----------------------------|--|-----------------------|--|---|
| 2013-14 | 21 | 0 | 41 | 37 | 4 | 37 | 5 2 NASA, 2 NSF, 1 GS | 7 | 14 | 2 |
| 2014-15 | 19 | 0 | 42 | 38 | 4 | 35 | 9 1 NASA, 3 NSF, 5 GS | 5 | 13 | 2 |
| 2015-16 | 20 | 1* | 43 | 27 | 17 | 39 | 9 1 NASA,,3 NSF, 5 GS | 9 | 14 | 3 |
| 2016-17 | 12 | 3 | 43 | 14 7F, 7S | 29 18F,11S | 35 | 7 4 NSF, 2 GS, 1 Dean | 7 | 14 | 3 |

- In 2016, it is due to **60%** (21/35) of Astro grad students being supported with **pure multi-year or full-year GRAs** (from startup, external grants, admissions package). Not optimal for students, advisor or program in the long term.

Recommendation for Graduate Student Support

- 1) While we may offer pure multi-year GRA support for a few of the most competitive admits, I recommend that for most student advisors offer support package as mix of
(GRA for several summers + TA & GRA for a few long semesters)

Example: Replace 60 K of GRA for 1.3 years with 2-year support
(\$20 K for 2 summers) + (30 K GRA for 2 long sem.) + (TA gaps \$4K for 2 long sem.°)

- 2) We ask all incoming students to TA for 2 long semesters over 4 years

Benefits/Caveats

- Good for students to TA 1 out of every ~3 long semesters (teaching, recomm. letters, communication skills)
- Advsors can focus grant support on summer when no TAs exist (4 students in 2016 have no summer support)
- Advisors can "stretch" grants to support students beyond 5th year of guaranteed support
- Competitive with peer public Univ ranked above or below us
Harvard & U Arizona: 2 required semesters of TA
UC Berkeley, UC SC, OSU: ?

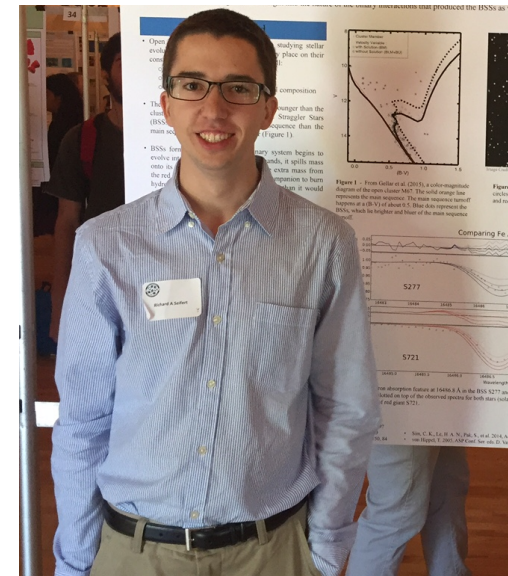
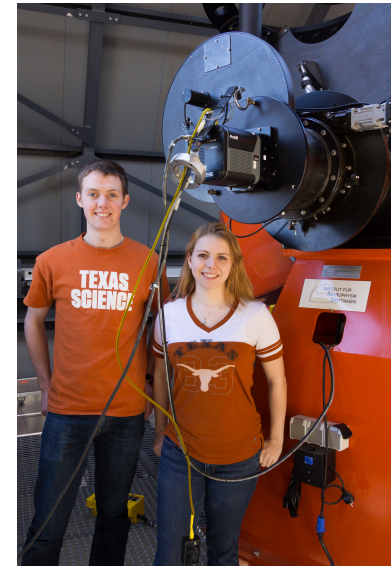
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Graduate Program Self Study

- Strategic Challenges and Opportunities
 - How to identify and help students without proper academic preparation
 - Should we be offering more inter-disciplinary courses?
 - Astronomy + Computer Science or Statistics: Big Data
 - Astronomy + Geology: Planetary science
 - Astronomy + Biology: Astrobiology
 - CNS report on 21st Century Graduate Education
 - Graduate Admissions
- See presentations by GSEC & Graduate Admission Committee (Bromm, Dinerstein, Wheeler, S. Finkelstein)
- See presentations by Raquel Martinez, Graduate Student Prep.

Undergraduate Program Self Study

- Success and challenges of UG program
 - What is our retention and graduation rate?
 - What is the impact of our astronomy FRI stream?
 - What are career paths after graduation?
 - How well do we prepare UGs for 21st century careers?
 - Innovative teaching (flip courses, experiential learning)
 - Should we be offering more inter-disciplinary courses?
 - Astronomy + Computer Science or Statistics: Big Data
 - Astronomy + Geology: Planetary science
 - Astronomy + Biology: Astrobiology
 - CNS report on 21st Century Undergraduate Education
- See presentations by UGSEC this afternoon (Milosavljevic, Kraus, K. Finkelstein, Casey)



Astronomy Undergrads Recognized as Dean's Honored Graduates

Rebecca Larson and Sarafina Nance recognized as Dean's Honored Graduates, an award given to less than one percent of the graduating seniors!



Rebecca Larson



Sarafina Nance

Astronomy Graduates at May Commencement Ceremony

Postdoctoral Program



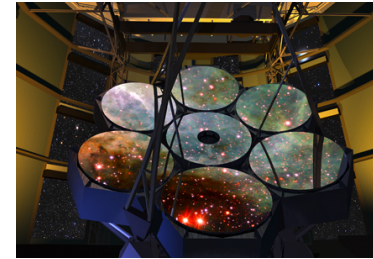
Postdoc Resource Page established this summer (research, prof. development, etc)
<http://www.as.utexas.edu/astronomy/education/postdocs.html>

“Introductory Guide for New Postdocs” being compiled by Brandon Bozek

Thanks to Taft for raising salary of Harlan Smith/McD Prize Fellowship to ~62 K.

See presentations by **Brandon Bozek (Postdoc rep)** and **Mike Boylan-Kolchin (PMC Chair)**

Faculty/Res Staff Engagement in GMT



Larger faculty engagement with GMT

- Develop set of slides to show at colloq/conference talk
- Coffee with donors while on colloquium/conference trips
- Science case simulations
- GMT SAC document: Attend Anita's seminar

Can we better enunciate the case for a 10% partnership ?

- Attract best researcher & advance ranking
- Leadership role in consortium
- Leverage to get science operations center in Texas
- Obs. time: what science can we do with 10% vs 5%?

How to develop a niche advantage wrt other "top 10" ?

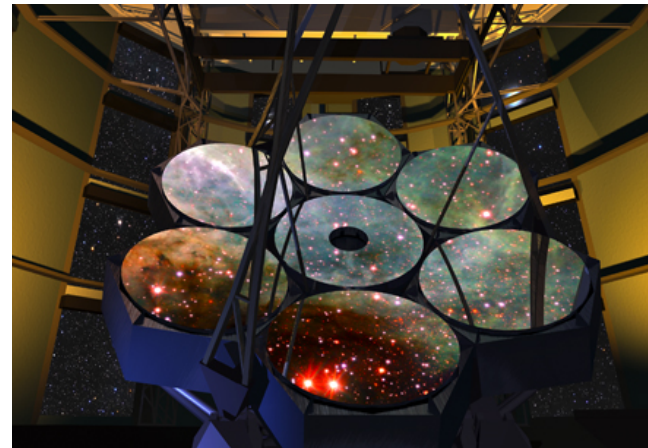
- Instrumentation
- Theoretical framework/predictions?
- Observation at complementary multi-wavelength ?

| | GMT | TMT |
|-----------------|------|-----|
| 1. Caltech | | ✓ |
| 2. Harvard | 5% | |
| 3. UC Berkeley | | ✓ |
| 4. UC S. Cruz | | ✓ |
| 5. Princeton | | |
| 6. U. Arizona | 10%? | |
| 7. Yale | | |
| 8. U. Chicago | ✓ | |
| 9. U. Cambridge | | |
| 10. UT Austin | 10% | |
| 11. U. Toronto | | ✓ |
| 12. Stanford | | |
| 13. Oxford | | |
| 14. OSU | | |

Fundraising and Alumni Relations

Existing endowments and BoV dues fund many initiatives to advance excellence:
Faculty Startup, Cox Funds for Graduate Excellence, UG Excellence, Research
Bashfest Conference, Visitor Program

Top two external fund-raising priorities; GMT, Graduate Fellowships



Welcome to new director of development, Keary Kinch

Focus BoV meetings on philanthropy

- Different BoV membership structure to honor different donors
- Tailored events for program leaders to cultivate donors: donor tables at BoV meeting

Graduate Excellence Endowment: Umbrella for 4 x 50 K endowments to build toward graduate student summer fellowship.

Fundraising and Alumni Relations

Expanding donor base beyond BoV to include Alumni and Friends (3500 non-science majors taking AST 301/309)

Change in communication with Alumni + Friends

- Will get calls directly from Astronomy (not CNS)
- Receive department newsletter
- Follow-up letter from Chair



Department newsletter

- Email Chair and Lara when you have a new paper or educational news
- Articles will be written by Lara, student helper, Rebecca

Building a stronger tie to our alumni base beyond fundraising.

Cosmos Seminar on Oct 12 by Sean Wang, PhD alumnus, Data scientist for Fidelity

Coffee with Donors : Please provide your colloquium or travel schedule to Chair & Keary

Keary's Cosmos Seminar in November on fundraising

Public Relations and Visibility in 21st Century

Department now has a twitter account [@utastronomy](https://twitter.com/utastronomy)

- Tweet manager : Lara
- Please email chair@astro for tweet-worthy professional events (Science, press release, awards, department events, BoV events. outreach, recruiting info,etc)



Department website not effective for engaging new donors, visitors, students, recruits

- Website being revamped to align with CNS websites (e.g., Physics CS)
- Department and McDonald reference each other, but maintain different website and focus
- Zeroth mockup of draft ready for review (top image is placeholder for a slide show)

Feedback from Retreat & Topics for Further Discussion

Today was a great start for initial discussion and identification of hot topics for follow up with future thematic COSMOS and Faculty/Research Sci. meeting

- **Faculty Hires:** How to make the most of Faculty Hires and Endowed Chairs (slides 8,9)
- **Graduate Program**
 - Graduate support: Proposed change by Shardha to offer more packages of (Summer GRA + Fall/Spring TAs) okay, but we should have flexibility on TA requirements (slides 14,15)
 - Grad Admission: Input of faculty with funds of long-list of 50. Rethink about ranking top 20.
 - How to identify and help students without proper academic preparation.
- **Undergraduate Program**
 - Frequency and use of Python for AST 376R. Require or strongly recommend AST 307.
 - Retention, Graduation rate. Preparation for for 21st century careers
- **GMT:** Greater Engagement of Faculty/Research Staff with GMT (slide 20)
- **McDonald:** Greater Engagement of Faculty/Research Staff with McDonald. Remote and/or Service Observing at McDonald
- **New Department Website, Twitter account and Initiatives for Alumni Relations**
- **Grad Stud. Input:** Stipend, Uneven TA load, Split TAs, Code of Conduct, faculty engagement
- **Postdoc Input:** Loss of health care, travel reimbursement, etc
- **Next Retreat? :** Yes, every 2 years. More discussion time. Closer location, off campus.