PHY 517 / AST 443:
Observational Techniques in Astronomy

Lecture 6:

Proposals
Time Allocation Committees
Final Presentations

Spectroscopy Lab

- data reduction guide and updated lab description now on github
- much less programming!
- not many groups checked in every week for exoplanet lab; explicit intermediate deadlines now specified
- if you have taken your spectroscopy data, your deadline countdown starts today

https://github.com/anjavdl/PHY517_AST443_Fall2016/wiki/Lab-3:-Diffuse-Nebula-Spectroscopy

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Lab 3: Diffuse Nebula Spectroscopy

Edit New Page

anjavdl edited this page 3 hours ago · 1 revision

Lab description:

https://github.com/anjavdl/PHY517_AST443_Fall2016/blob/master/spectroscopy_lab/nebula.pdf

Equipment quick-start instructions:

Telescope
Spectrograph
CCDSoft

Guide for spectroscopic data reduction:

https://github.com/anjavdl/PHY517_AST443_Fall2016/blob/master/spectroscopy_lab/spectra_reduction.pdf

Reference arc lamp spectra:

Neon
Mercury
NIST Atomic Database

7. Lab report

The general instructions for the reports apply. Make sure to include

- A discussion of the type of the nebula you targeted, why its spectrum is purely emission lines, and why certain line ratios are sensitive to the gas temperature and/or density (refer to the relevant chapters of Osterbrock & Ferland 2006).
- Keep track of your data reduction steps. Keep a (cleaned) version of this file up-to-date on github.
- Document your data reduction steps with figures / screenshots.

The timeline for the lab report, and intermediate check-ins is the following:

+1 week: Send in the extracted, wavelength-calibrated, and exposure-averaged spectrum for each wavelength setting.

+2 weeks: Send in your total sensitivity function and the flux-calibrated spectrum of the nebula. Also send in a table of measured emission line strengths.

+3 weeks: Report your estimates of line ratios, extinction, gas temperature and density, as well as literature-reported values. Present an initial assessment / interpretation of any discrepancies. Prepare an outline of your lab report.

+4 weeks: Hand in your lab report. Make sure that your analysis codes are attached to your report, or available on github.

Python help

- github wiki now includes basic python guide on:
  - reading in text files
  - making and saving plots
  - fitting functions

Telescope time proposals

- writing (successful) proposals is an essential part of being a researcher
- ... at the latest, when you need to apply for funding
- observational astronomers need to submit proposals for telescope time

Example: Hubble Space Telescope

- proposal deadline once per year (~April)
- typically ~1000 proposals
- ~20% success rate
- open to anyone

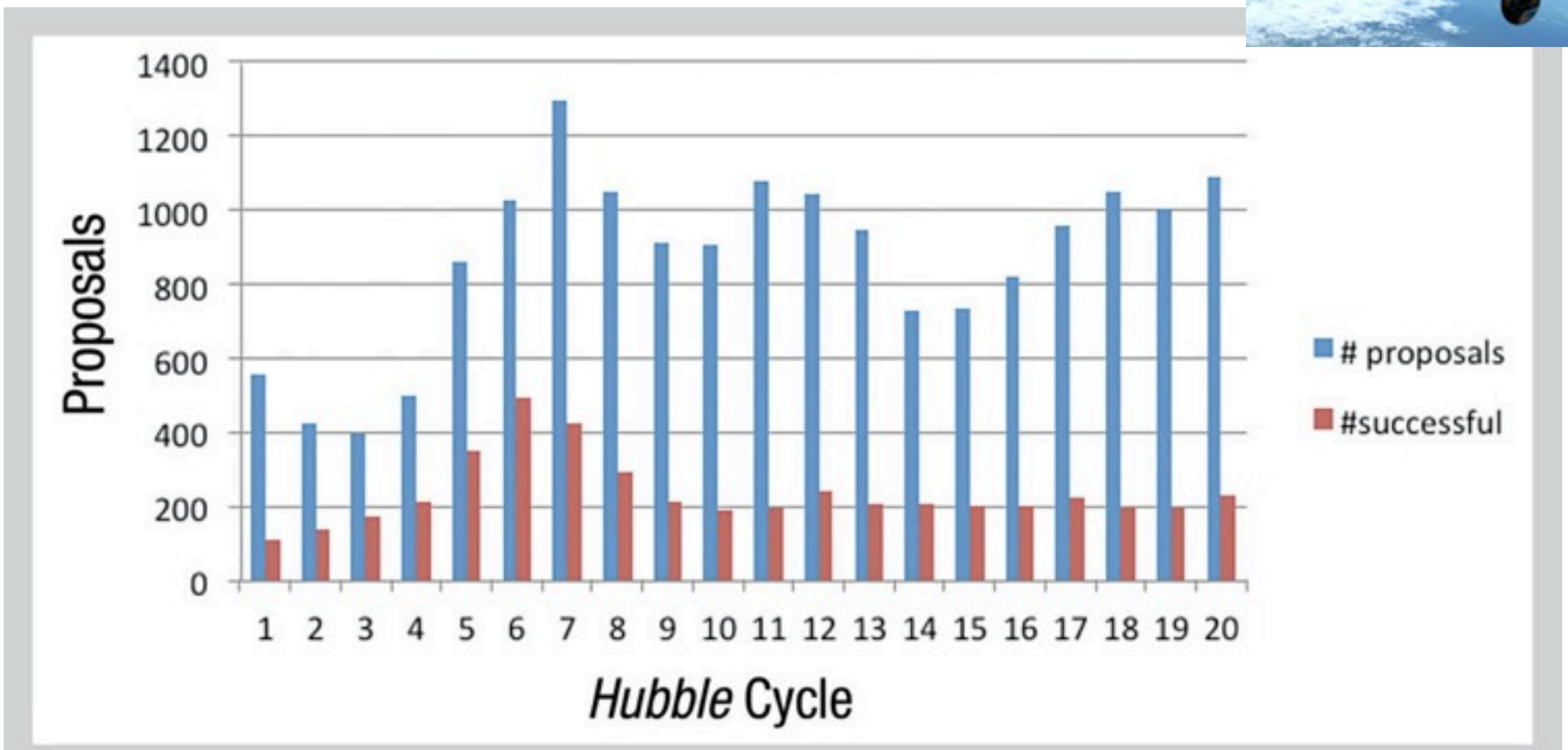

Figure 1: *Hubble* proposal pressure by number of proposals. The blue histogram shows the number of proposals submitted each cycle; the red shows the number accepted. The Cycle 7 statistics include the cycle 7N and 7AR proposals. The oversubscription ranges from 2:1 in Cycle 6 to more than 5:1 since SM4.

NOAO

- NOAO = National Optical Astronomical Observatories
- US national research & development center for ground-based night-time astronomy
- manages most telescopes with US-wide access
- own facilities: Kitt Peak National Observatory (KPNO, Arizona), Cerro-Tololo Inter-American Observatory (CTIO, Chile)

- Calls for Proposals 2x per year; deadlines end of September and end of March

ESO

- ESO = European Southern Observatory
- manages the Very Large Telescope (VLT; Chile)
- also open to anyone; preference for European projects only in direct conflicts

- Calls for Proposals 2x per year; deadlines end of September and end of March

ALMA

- ALMA = Atacama Large Millimeter Array
- multi-national project
- proposals through respective managing facilities, e.g. for US: NRAO = National Radio Astronomy Observatory

- proposals ~1x per year

Other

- some facilities are not open-access, but only available to researchers at the institutions / countries who built / finance them
- for example:
  - Keck telescopes (mostly CalTech, University of California + University of Hawaii)
  - Subaru telescope (mostly Japan + University of Hawaii)

How to write a good proposal

- come up with a good idea!
- check:
  - has it been done before?
  - is the data already in a telescope archive?
- research what are the best instruments to use
  - sensitivity
  - field of view
  - resolution
  - ...
- figure out the technical details
  - what filters / gratings / bands
  - exposure times
  - observability

Proposal Structure

- cover sheet
  - abstract
  - PI and CoI names, addresses
  - time request
  - telescope / instrument / set-up request
- Scientific Justification
  - usually limited, 1-4 pages
- Technical Justification
- Figures, Tables, References, Object lists

Scientific Justification

- describe your project to a knowledgeable, but non-expert audience
- make it exciting / important!
- build on (your) previous work / experience - make sure to convey that you have done all the preparations
- polish the text - typos and carelessness are distracting

Technical Justification

- describe your proposed observational set-up in detail
- explain every part (telescope, instruments, filter, etc.)
- most important: explain and document the exposure time request
- most instruments have Exposure Time Calculators to relate signal-to-noise and exposure time

Time Allocation Committees

- proposals are reviewed by panels of researchers, chosen by the responsible agencies (e.g. HST - STScI)
- panels are assembled by topical groups (e.g. cosmology)
- every panelist has to read every proposal assigned to that panel, typically ~80
- preliminary grades submitted online
- 2-day meetings to discuss all proposals and finalize grades

AST 443 / PHY 517 proposals

options:

- write a proposal for one of the labs, using our equipment
  - another exoplanet?
  - saw something interesting - need more data for your original target?
  - your observations didn't work - need to re-do the lab?
- write a proposal on something different, using our equipment
- write a proposal for any telescope / instrument

AST 443 / PHY 517 proposals

rules:

- every group submits one proposal per category (imaging / spectroscopy / radio)
- the PI of the respective lab report cannot be the PI of the proposal

deadline: **Nov 16, 5pm** (strict!)

proposal template available on github:

https://github.com/anjavdl/PHY517_AST443_Fall2016/wiki/Proposals

AST 443 / PHY 517 TAC

- date of TAC meeting: Nov 30
- 3 panels: imaging, spectroscopy, radio
- we will assign you to a panel

- make sure you are ready to critically assess and discuss your peer's proposals

Final presentations

- last assignment in class: give a presentation on one of your labs
- your presentation will be on the lab that you were neither the lab report PI nor the proposal PI
- 10 minute talk + 5 minutes questions

- Dec 5 + Dec 7