SCIENCE SUPPORT BREAKOUT SESSION

Maunakea Operations and Engineering Workshop

8 Dec 2016

DISCUSSION TOPICS

Supporting Science Users:

- What level of support is practical/necessary/desirable for outside users?
- What tools are we using to support proposers?
- What tools are we using to support data reducers?
- What are the pros and cons of manual vs automated scheduling and data verification?
- What additional considerations do large projects require?

DISCUSSION TOPICS

Supporting Scientists:

- How can we facilitate more interaction between scientists at different Maunakea observatories on both operational and scientific fronts? What are the available/preferred means of communication?
- How do we address career issues such as training for various work duties, or balancing research and functional duties?
- Are there ways to make the position more “family friendly” and to support dual career couples?
- Can we share resources on issues faced by international staff?

WHAT LEVEL OF SUPPORT IS PRACTICAL, NECESSARY, AND/OR DESIRABLE FOR OUTSIDE USERS?

CHRISTOPHE DUMAS
TMT

TYPES OF SCIENCE SUPPORT

- We can distinguish three types of support:
  - Pre-observing
    - All support related to proposals preparation
    - Also includes access to archives and database of meta-data related to past/executed observing programs
  - Observing
    - Science-operations support during observations
      - Remote, on-site, eavesdropping, ToO support in queue mode, etc
    - (Not relevant for programs based on archival data)
  - Post-observing
    - Calibration material (observatory wide, instruments)
    - Data-reduction software and tools

NECESSARY/DESIRABLE/POINTLESS . . . WHERE SHOULD THE LIMIT BE DRAWN?

- Risks are to:
  - Underdo wrt developing supporting tools, infrastructure, documentation
    - Consequences:
      - Lower science production and science impact
  - Overdo by developing material that does not match the users needs and/or expectations
    - Consequences:
      - Waste of internal resources
      - Confused users, loss of trust
- Need to keep the loop closed with the user community
  - Forums/meetings, user committees, surveys

A FEW EXAMPLES OF BASIC & ENHANCED SUPPORT (. . . NOT EXHAUSTIVE)

- Pre-observing
  - Proposal submission tools/interface, instrument/observatory documentation, data-archive & query, help-desk, usage statistics, preparation tools, program database
- Observing
  - Observatory policies and standards, support staff, quicklook, data-reduction tools, remote support equipment, fast data-access, SciOps statistics
- Post-observing
  - Standardized data-reduction tools, data-reduction documentation, data-archive & query, data-reduction workshops

WHAT TOOLS ARE WE USING TO SUPPORT PROPOSERS?

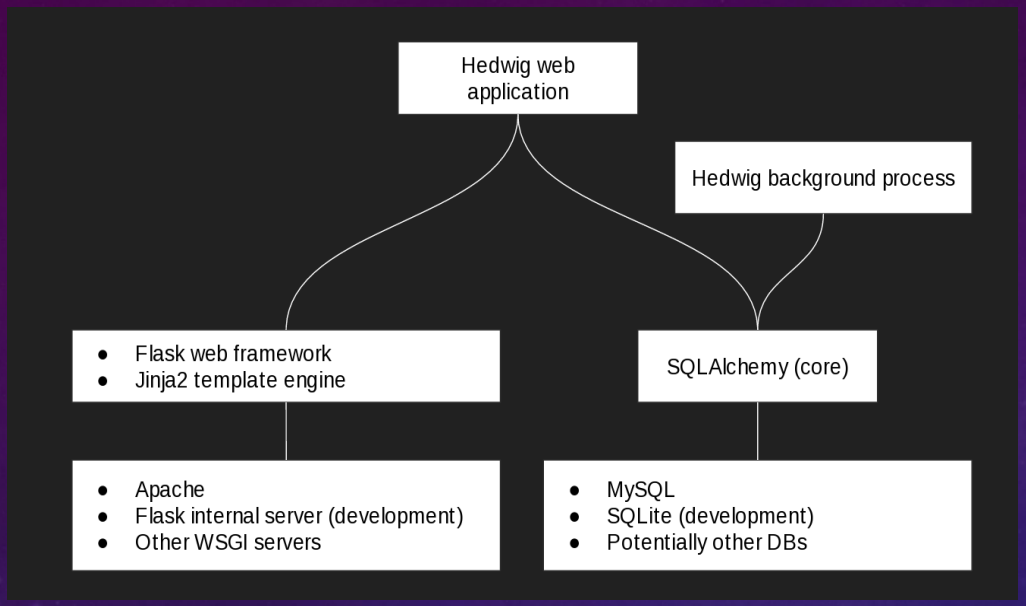
SARAH GRAVES
EAO/JCMT

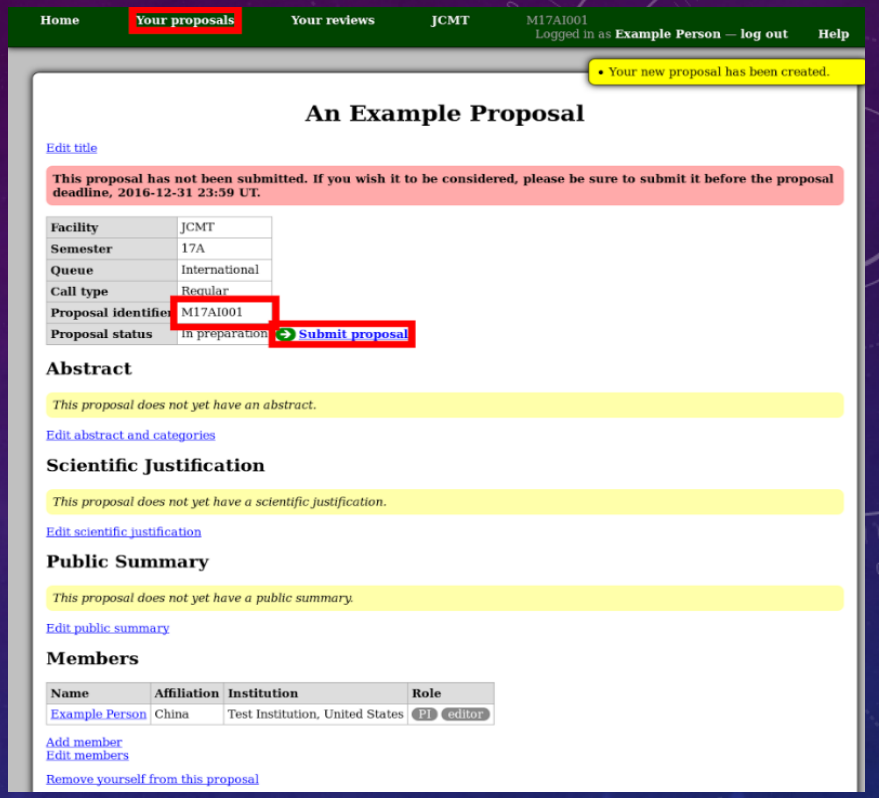
SUPPORTING PROPOSALS

- Proposal submission and evaluation software.
- Different observing models and their effect on proposal systems.
- Supporting assessments by Telescope Staff/Reviewers/TAC.
- Supporting new users.

Hedwig: observing proposal submission and review system

- An open source Python based proposal/evaluation tool: flask web app and db tables designed for simplicity and flexibility. Replacement for NorthStar
- https://proposals.eaobservatory.org
- Designed to work for any/multiple telescopes: telescope specific customisation written into separate modules
- Includes a review & feedback system (JCMT: used by internal and external reviewers, and TAC). Special TAC meeting tabulation pages.
- Contact g.bell@eaobservatory.org if interested, or see http://hedwig-proposal-system.readthedocs.io/, or https://github.com/eaobservatory/hedwig





Points for discussion:

- Requirements of proposal systems
- Common issues?
- Performance at deadline time.
- Editing and re-submission before deadline?
- Integration with observation prep tools.

OBSERVING/PROPOSAL MODELS

- Queue vs night-based scheduling vs a mix
  - All still require basic idea of a) submission, b) evaluation, c) entry into schedule or database of queued observations.
  - Different requirements on support scientists and software needed.
- Single semester vs e.g. Gemini's Fast Turnaround
  - Advantages of peer review?
  - Pitfalls?

SUPPORTING ASSESSMENT BY OBSERVATORY STAFF/REVIEWERS

- Calculators: e.g. integration time at JCMT
  - Hedwig has these built in to the JCMT module, so that calculations (results and variables) are saved to a proposal – much easier for support scientists to check.
- Do users try and play the system when writing their requests?
- Link with metrics – do you ask them to report on success of previous proposals (i.e. papers published)? Is this factored in to decisions?
- Order of assessments: technical & scientific?

SUPPORTING NEW USERS

- Do users know what a good proposal looks like? How do they find out?
  - Ciska Kemper's talk on “writing a good observing proposal” (after having reviewed >1000 proposals)

http://www.eaobservatory.org/jcmt/wp-content/uploads/sites/2/2016/04/Ciska-Kemper-Writing-a-good-proposal.pdf

- Technical issues: instrumental capabilities etc.
  - How to provide information most clearly.
  - How to get users to read it.
  - Encouraging them to ask for help at appropriate points.

WHAT TOOLS ARE WE USING TO SUPPORT DATA REDUCERS?

LUCA RIZZI
KECK

ADASS 2016: Pipelines paired with archives effectively double the productivity of an instrument.

My experience:

JAC (UKIRT/JCMT): ORAC-DR produced science quality data of unsurpassed quality
KECK: What? Pipelines? But things are slowly changing

- Keck is no longer just a Caltech/UC observatory (Yale, Australia, NASA)
- We have an archive
- Partners are strongly interested in developing pipelines
- Effectively, no funding for the time being, but lots of interest and support from Science Steering Committee

Questions:

- Does your observatory officially support pipelines or data reduction tools, and at what level?
    - Development of new tools?
    - User support via ticket system?
    - Data reduction done in house and final products delivered to users?
- What fraction of the observatory budget or FTEs is dedicated to data reduction?
- What is the level of standardization across multiple instruments or modes?

- Is there interests in a more unified effort?
    - Contribution to astropy?
    - Common repository for algorithms?
    - 2 yearly meetings for data reduction techniques?
    - Classes on advanced techniques payed jointly by the observatories with experts in the field?
    - A data reduction school?

WHAT ARE THE PROS AND CONS OF MANUAL VS AUTOMATED SCHEDULING AND DATA VERIFICATION?

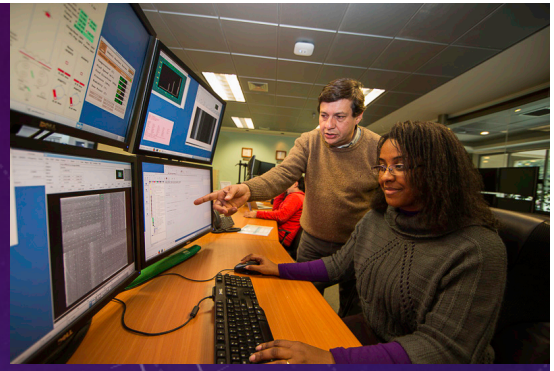
CLAIRE MOUTOU
CFHT

ASTRONOMERS OR ROBOTS?
HOW MUCH OF OUR SUPPORT WORK SHOULD BE AUTOMATIZED/MANUAL?

QUEUE SCHEDULING

- In survey mode, total scheduling automation is possible + more efficient; input parameters and merit factor can be as complex as needed
- Scheduling can then become dynamical and boost the telescope productivity
- With variety of users and programs, + observatory offering lots of flexibility on execution conditions, human intervention is needed

DATA VERIFICATION



- Quicklook, external measurements and pipelines must provide an exhaustive list of quality assessement values + visualization for the observer and the « verifier »
- Human looking at data will still find the unwanted, unexpected defects missed by SW or use experience to suggest pipeline improvements
- It’s important practice for astronomers to look at MANY images – raw/processed, calib/science – all along their support career/inst lifetime

AT CFHT: WE'RE MOSTLY MANUAL

- A queue coordinator manually selects and organizes the observations for next night
- The observer may still manually adapt the queue to the conditions
- The astronomer manually validates the observations of previous nights
- Human errors exist, flexibility is granted for users, very few automatic data verification

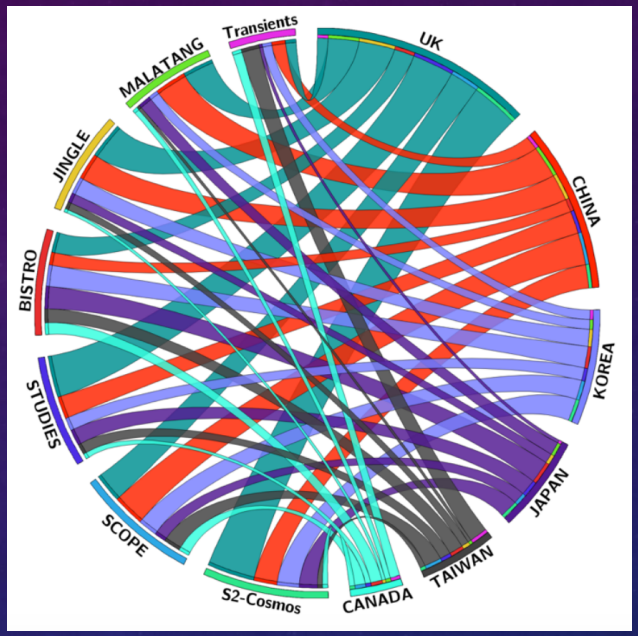
PROGRESSIVELY TOWARDS MORE AUTOMATIZATION

- 70% survey mode: we're in the process of offering scripts for the scheduling of very large programs (cosmo survey, planet search)
- Queue optimization solver under study
- With instruments providing 100+ images (nIR and FTS) per night, automatic validation is starting to be put in place
- Next coming instrument: instrument performance DB + analysis tools will be put in place

WHAT ADDITIONAL CONSIDERATIONS DO LARGE PROJECTS REQUIRE?

HARRIET PARSONS
EAO/JCMT

Large Programs - JCMT - 8 programs - started Dec 2015



Aim:

- Expand on JLS (JCMT Legacy Surveys)
- Best use of telescope time (time for the *big* science questions)
- 50% of telescope time over three years (~2,400 hours initially)
- A good way to train and integrate a new community
- Soon to extend up to January 2020 (call will close in March 2017)

Success:

How is success determined?

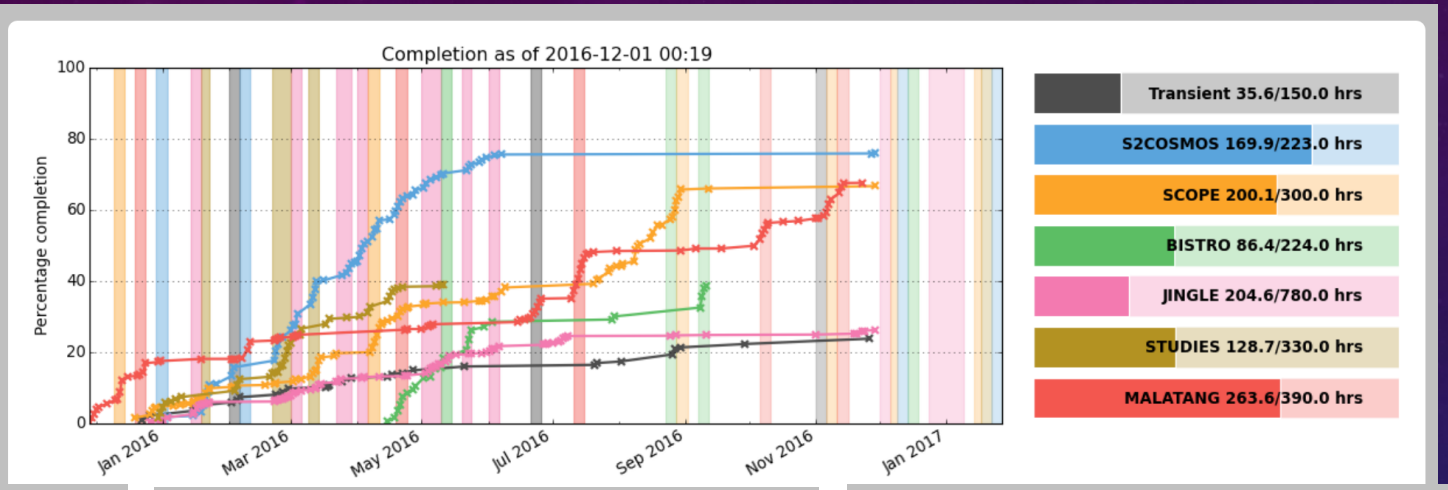
- no. papers/impact of papers networking/training-software/training-observers?
- Same metric for difference science programs?
- What is success to the:
  - Funding agency?
  - The board?
  - The observatory?
  - The astronomer?

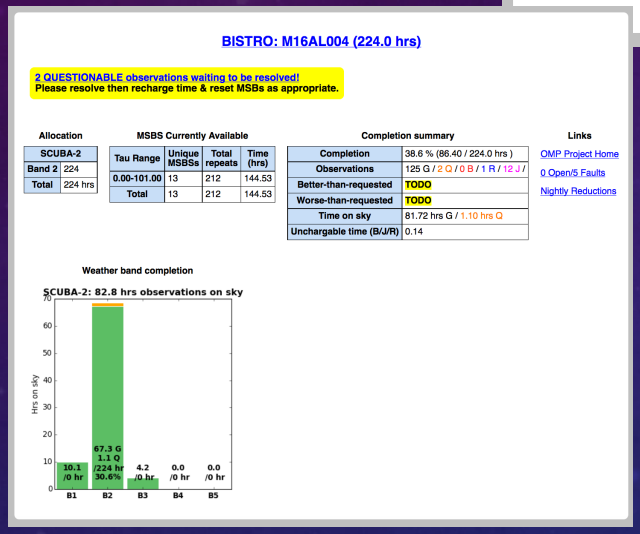
Challenges:

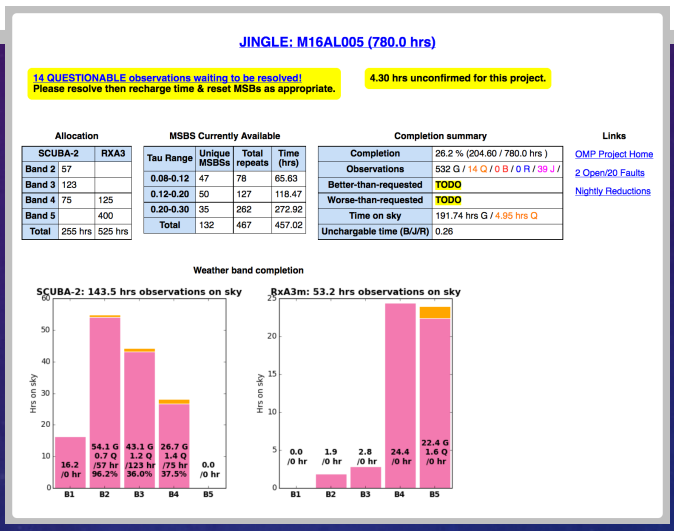
- Encouraging collaborations /managing expectations
- Productivity early on in new multi-regional organization (*cultural?!?*)
- Personalities - management styles, external collaborations, previous collaborations

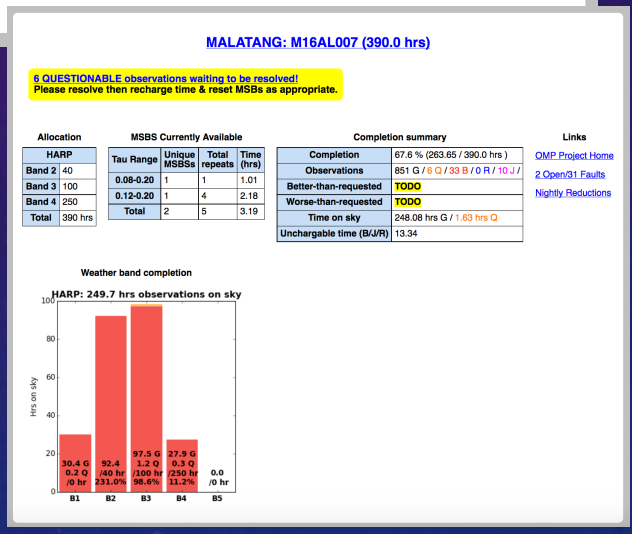
Monitoring

Dynamic webpage allows for easy monitoring of the programs.

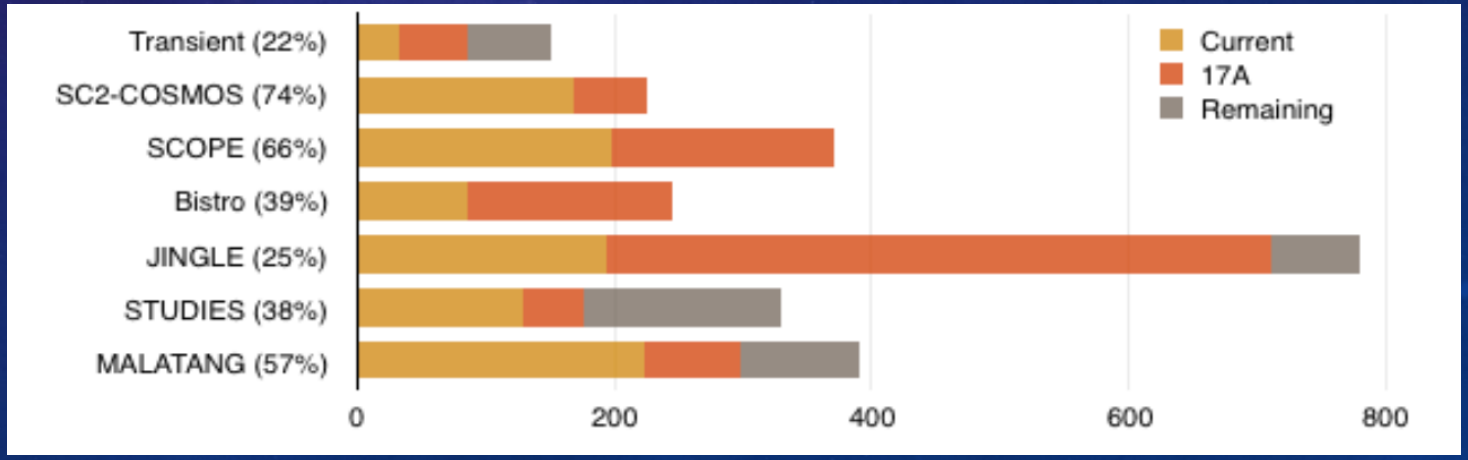




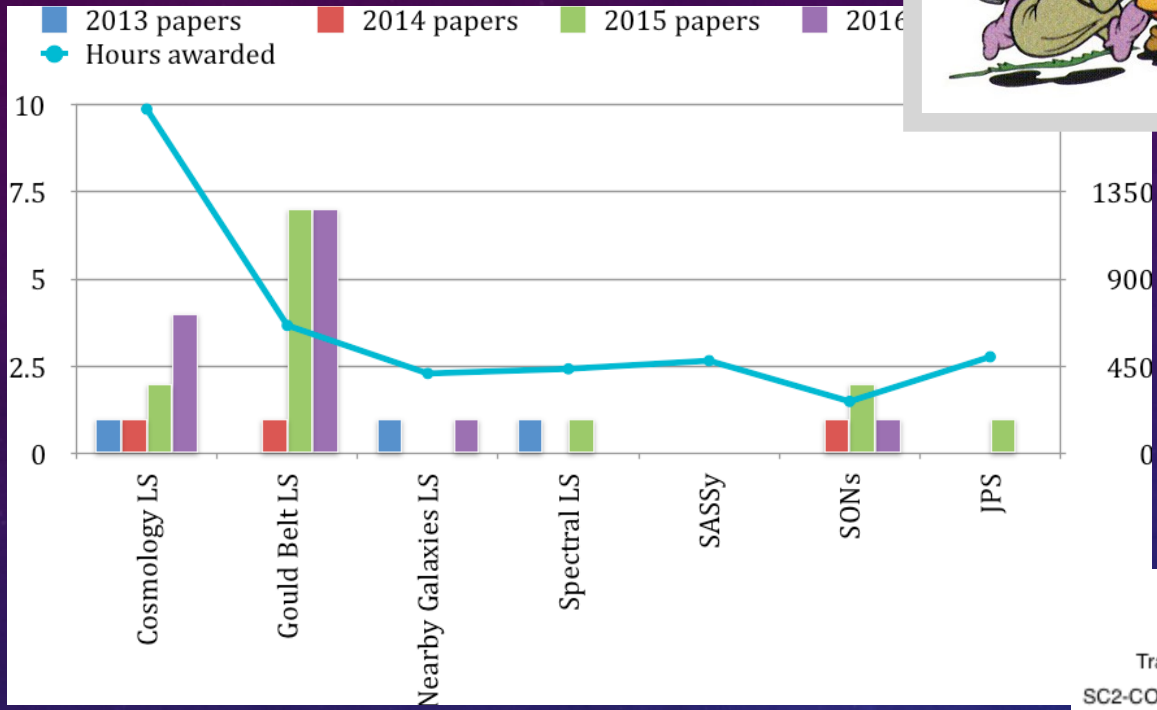




Predictions to keep an eye on the future.



Snow White and her stick

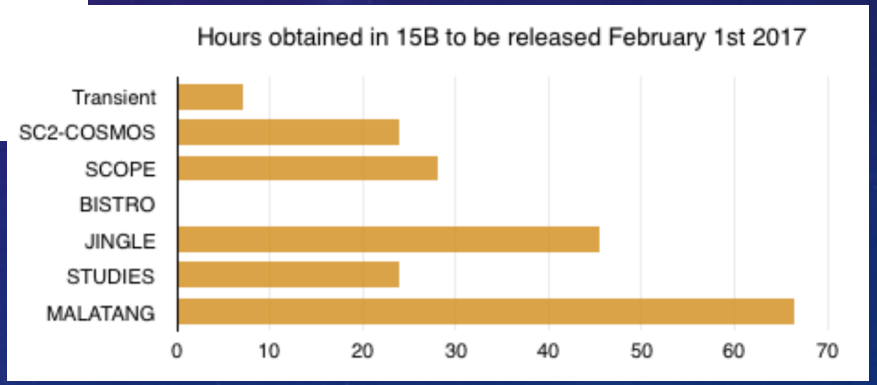


Lessons of the past:

Discrepancies in productivity

It is best to incentivize!

Easiest way: make the data public!



Carrot & Stick:

- Carrot - all the lovely data
- Stick
  - All new proposals (not just large programs) must declare previous data and publications resulting from them.
  - Proprietary period for *all* data is a year (at the end of semester in which it was taken). This includes the Large Program data.
  - We have a very nice archive, where we see a number of publications come from.

HOW CAN WE FACILITATE MORE INTERACTION BETWEEN SCIENTISTS AT DIFFERENT MAUNAKEA OBSERVATORIES ON BOTH OPERATIONAL AND SCIENTIFIC FRONTS? WHAT ARE THE AVAILABLE AND PREFERRED MEANS OF COMMUNICATION?

SAEKO HAYASHI
SUBARU

From

To

Operation
Engineering
Technical Support
Science
Visiting scientists
…

The Tower of Babel by Pieter Bruegel the Elder (1563), Google Art Project.

http://www.startrekmovie.com
http://screenrant.com/retro-references-star-trek-beyond/?view=al

WHAT BRINGS US TOGETHER?

- Crisis – weather
- Crisis – social environment
- Daily effort
  - Safety or Operation officers meetings
  - (Science) seminars
  - Equinox Party, Research Jamboree
  - MKAOC and community events
  - Social events
- Career among the mountain ‘Ohana

HOW DO WE ADDRESS CAREER ISSUES SUCH AS TRAINING FOR VARIOUS WORK DUTIES, OR BALANCING RESEARCH AND FUNCTIONAL DUTIES?

JOSH WALAWENDER
KECK

TRAINING

- Support staff often have to perform duties which are not part of the typical academic training:
  - e.g. project manager, systems engineer, budget manager, programmer, mechanical design, electrical design, optical design

TRAINING

- On the job training
- Workshops at AAS or SPIE meetings
- Software training workshops
    - Software Carpentry (interest in one here?)
    - I can recommend SciCoder workshop and the SciPy conference tutorials

BALANCE OF RESEARCH AND OBSERVATORY DUTIES?

- "Science time happens in the 20% of your time after you go home from the office."
- At some level people in observatory jobs enjoy support and want to do it well, so you're fighting your own inclinations as well as institutional pressures on your science time.
- How does the institution view science time?
- Researchers at observatories have more limited access to students (Akamai, UHH, REU are solutions)

QUESTIONS?

- How does your institution view science time? As a cost to them or as part of their mission?
- What institutional support is there for your science activities?
  - Time: how much science time is in your job description?
  - Funding: are you given a research budget?
  - Travel: do you get travel funds for science related travel?
  - Equipment: do you get equipment paid for?
  - Technical support: does the staff support your science efforts as they would observatory operations?

ARE THERE WAYS TO MAKE THE POSITION MORE "FAMILY FRIENDLY" AND TO SUPPORT DUAL CAREER COUPLES?

ALISON PECK
GEMINI

ARE WE FAMILY-FRIENDLY?

- Travel and observing schedules

  Parental leave? Support/reimbursement for childcare to attend a conference? Keep travel and summit schedules fair without making it impossible for new parents or putting unfair burdens on child-free staff?

- Long hours and proposal deadlines

  Provide “science leave” in advance of deadlines? Provide location in another building for science leave? Remote telescope support?

- “Tenure clock”

  adding a year (or so) per child, providing “return to work” grants or additional research time to catch up

- Mentoring

  Helping junior staff and postdocs find work/life balance, sell themselves (raise profile, take credit...)

- Frequent relocation

  Provide info about schools, other resources

http://www.mso.anu.edu.au/external/raec/GenderAccessAndEquityANURsaa_March2014.pdf

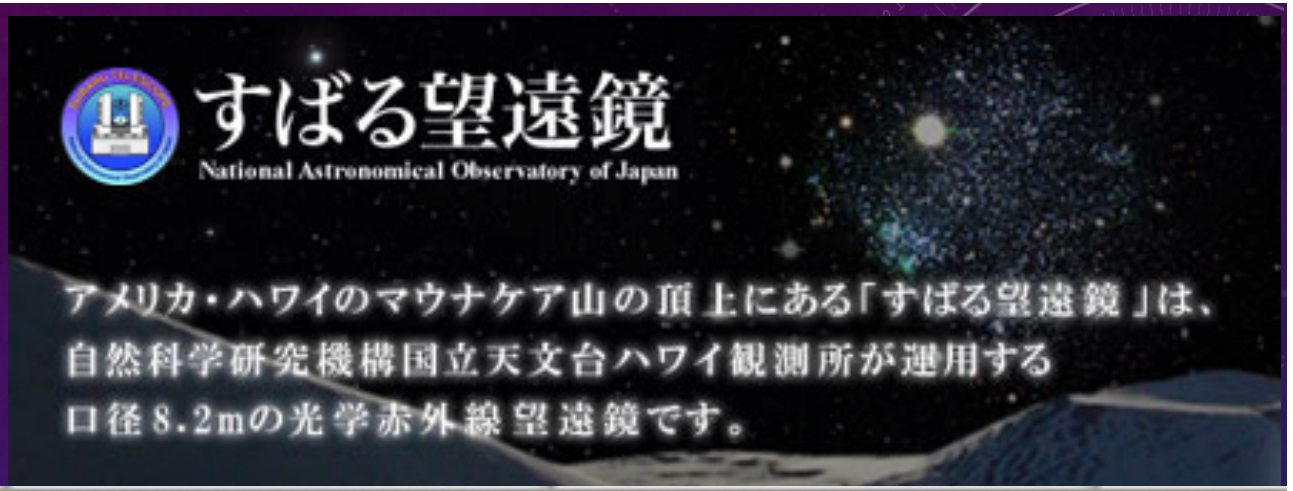
CAN WE DO MORE TO SUPPORT DUAL CAREER COUPLES?

- Most of our budgets are not sufficient to create a second position for a partner – what are alternatives? Can we provide workspace for partners to work remotely if their jobs are elsewhere? Can we allow staff to work remotely for some fraction of their time if their partners are elsewhere?
- Can we share resources amongst observatories to facilitate any of these options? e.g. give hiring preference to applicants with partners at other observatories, provide guest offices for other facilities if available…

CAN WE SHARE RESOURCES ON ISSUES FACED BY INTERNATIONAL STAFF?

ANDRE-NICOLAS CHENE
GEMINI

INTERNATIONAL BY NATURE



CANADA-FRANCE-HAWAII TELESCOPE

WHAT IS BETTER?

Assuming the cost of properly supporting staff coming from all around the world.

OR

Limiting our staff to those who can more easily establish their lives in Hawai'i.

LESSON LEARNED: DON'T DEPEND ONLY ON HR

- Open a bank account
- Fill tax forms
- Build a credit history
- Apply for visas
- Spouse
- Kids
- Pets
- …

SUMMARY

- Most of these topics were of interest to all observatories
- This was a LOT to try to pack into one session
- We would like to do this again, continue various discussions
- Alison will make a google group for participants to keep in touch and decide whether/how often to meet again
- Preliminary date for next 2hr session – mid-March