EAO and JCMT

An adventure story

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What makes a good story?

• Need a central character, a tragic figure who faces a dreadful uncertain future

• Four new young adventurers (NAOC, NAOJ, ASIAA and KASI) join up with two battle-scarred veterans (UK and Canada) — this merry band of heroes come out of seemingly nowhere to aid our beloved heroine

• A journey filled with sudden, unpredictable dangers and unforeseen challenges

• A deadline our heroes must beat in order to triumph
Setting the scene... March, 2015

• Some backstory... JCMT funding from the UK and Canada is ending in February 2015 - the future for this facility looks grim.

• A light on the horizon - the East Asian Observatory: a new partnership of astronomical institutes from China, Japan, Korea and Taiwan, agrees to assume JCMT operations

• March 1st - EAO steps into the breach

• The observatory was fully shutdown - and VLBI observations must start on March 20

• Instruments are warm, computers are shutdown, there is no Time Allocation Committee, no science program, no community

• We have three weeks until startup, so naturally...
First VLBI fringes - March 20th

- JCMT and 6 SMA antennas
- JCMT baselines in yellow
Creating a community

- How do you create a full science program with four new communities in three weeks?
- You make it free - Pilot Science: 30 hours of time, no strings attached.
- Call opened on March 1st
- Very worried that we would start on sky with no programs…

Nope…144 Programs received in five weeks
Science Calls

• JCMT has opened five Calls for Proposals in twelve months.
• Pilot Science - 144 proposals
• 15B —first Call assessed by TAC
• Large Programs — 8000 hours requested by 19 programs
• 16A… seeing some proposal fatigue — still an over-subscription of more than 2
• 16B — Call has just closed
• Total: 20,000 hours requested, 800 investigators from six regions involved
In the middle of our crazy year, we thought we would have our genius scientific programmer, Graham Bell, write a brand-new proposal system.

- From scratch.

Hedwig - has been used for 16A and 16B Call for Proposals
JCMT Operations

• Observing time distribution: 50% Large Programs; 50% PI Proposals

• Large Programs: Open to all partners participation

• PI Proposals: Any participating partner may submit to the Calls - collaboration encouraged

• PI Proposal Time: Allocated according to cash and in-kind contributions to Operating Budget

• TAC: one unified TAC process - priority on telescope by science ranking

• Observers: Scheduled Projects send Observers - in one year we have had over 100 scientists visit to observe with us

• Queue Mode: Flexible Schedule according to Weather

• Currently partial on-site and partial remote night observing (1/3 of time) + extended observing
JCMT Ops

• Critical to catch every photon and do something useful with it

• Optimizing operations pays off in more science time

• JCMT fault rate ~2.5% of time every night (less than 10 minutes)

• Extended observing adds up to two additional hours of science time a day

• Average science on sky is 10 hours a night
A challenge for our heroes...

- 15B semester about to start
- Highest ever subscription rates
- Hugely successful Large Program Call
- Everything looking wonderful…
- Enter El Nino
Maunakea blues

• Significant, sustained protests occurred throughout 2015 on the Big Island in regards to the construction of TMT on Maunakea

• Staff were prevented from operations, stress and tension were high

• Progress was limited though direct confrontations have decreased since the Supreme Court stay of the TMT permit

• A new contested case hearing will occur in August of this year

• The East Asian Observatory is working with other Maunakea Observatories to create ways to restore and improve communication and understanding between the native Hawaiian groups and astronomers to find a way forward together
Publications

- 84 papers expected in 2016 - good but we can do better!
- Hoping to increase this paper production rate - the key is good, consistent DR and an accessible archive
- And collaboration!
First EAO Paper


- JCMT resolves G192 into 2 compact sources (middle) plus an extended envelope (right)

- Distance ~ 400pc; Sources: G192N (0.43 Mo); G192S (0.23 Mo); Envelope (1.2 Mo) — G192S may be forming a brown dwarf (<0.08 Mo)

- Taken during Pilot Science! (April 2015)
POL-2: the little polarizer that could

• POL-2 commissioning became the Observatory's highest priority once operations were running again

• The first observing mode, the POL-2 daisy, was successfully commissioned in February

• The instrument was made available for 16B observing - Hedwig has an integration time calculator for using the instrument

• The BISTRO large program is also now starting to use the instrument

• Instrument Polarization still not well understood

• New observing mode options still to be investigated
Why Pol-2 is key

- Dust grains are elongated, and slightly charged, so they align with the magnetic fields present.
- Understanding the structure of the magnetic fields provides a wealth of information.
Large Programs begin

• 7 programs awarded time and observations start in December 2015
• Harriet Parsons will present the details
• Science talks to follow later today
• El Nino turns from villain to hero…

No snow all winter - >80% Grade 1 and 2 weather in February
Driest winter on record
The adventure continues

• 2016: An expert panel on new instrument initiatives meets in Taipei: full report by Ming-Tang Chen to come

• Now recruiting! Two students at EAO (from Canada and China) but we want more

• Stay tuned for the exciting next chapter…

• And here are the real heroes of the story