

NYAC Telescope Discussion  
Oct 21, 2011  
Skidmore College

In attendance: Chris O'Dea, Mary Crone Odekon, Rose Finn, Becky Koopmann, Stefi Baum, Stan Metchev, Fred Walter, Fred Chromey, Christina Lacey, Tom Sebring, Janie Schwab. Joel Kastner, Emily Rice, and Jamie Lloyd joined via telecon.

Discussion began 3:15

Chris O'Dea presented a review of the events since Oct 2008, including the call for white papers on telescope models, the setup of the Telescope Committee Survey, and the report of the committee. The goal for the discussion is to unify around a plan to get financial support and a plan for the NY State telescope that meets the needs of the NYAC members.

**Rose Finn reviewed the Telescope Committee Report Summary.** In the following discussion, these points were made:

- Any option will need a champion. There must be enthusiasm in the community for a project to go forward. NYAC was created to get a telescope for NY state. 10 year timescale is not surprising for a large telescope.
- Any opportunity to join Gemini is now gone. A similar proposal would need a leader.
- One of the recommendations of the report was to investigate options for joining an ELT. However there was no white paper for an ELT and no champion for such a telescope.
- Committee identified a lack of funding as a problem. This is normal at this stage, particularly since the telescope design is not fully developed. There were 3 months to develop the white paper and so cannot base funding on this incomplete model. Yet, need model to be funded, but funding determines the model.
- Relevant that NYS has not done this before, e.g., we've never had a TAC.
- In some ways, committee seems to be suggesting 'start again'.
- A question was raised whether ASNY's mission to get a telescope needs to be reexamined. Should ASNY concentrate on education and figure out ways to help NY astronomers to get time on existing telescopes? Yet, the Board decided 3 years ago to go ahead with a telescope. ASNY also in danger of losing R1 connection without a telescope. With a large telescope, we could also have smaller telescopes for a small fraction of the cost, i.e., a New York Observatory.

**Tom Sebring and Stefi Baum presented information related to the ATNY project.** Tom pointed out that without passion and a champion for this project, it won't get off the ground (e.g., Sidney Wolf was instrumental in building Gemini). Looking at status of planned large telescopes, costs are expected to be:

Advanced Tech Solar Telescope: \$350mill

LSST: \$600mill

CCAT: \$150mill

TMT, GMT: >\$1bill

NSF budget right now no more than LSST costs, and we may not make it to get LSST. Not known if a largish general purpose telescope is currently under construction. Keck was 20 years ago – brilliant architecture, but we can do better now. The Next Generation Canada-France-Hawaii (NG-CFHT) telescope will be a 10m WFOV with multi-object prime focus spectrometer with main science mission to followup LSST observations (i.e. dark energy). It ranks ahead of CCAT in the Canadian 10-year survey. It is most similar to ATNY of any other undertaking and roughly the same cost, so our estimate for ATNY is at least in the ballpark.

Current focus must be on how to raise the money. Note that we should consider establishing an undergraduate component similar to the Undergraduate ALFALFA Team project involving undergraduates at Arecibo via Cornell PI's and 19 undergraduate institutions around the country (R. Koopmann, PI of NSF grant).

Tom has had discussions with Corning and ITT. Toptica in Victor, NY, designed a laser guide for Gemini/Keck.

Estimates \$110m for telescope, based on \$30k invested in telescope study. A real concept study costs \$1mill, which is not going to happen in the next year; can do a decent study for \$100-200k.

A possible model is to collaborate with NOAO or another observatory consortium. Under this model, we could make an arrangement to set aside time on a suite of existing telescopes. NOAO has good instrumental capability and is not currently a partner in an ELT. Canada also is looking for collaborators, though they want to lead. Mauna Kea Observatories also looking for trades. NOAO is interested in developing the Marrado site near CTIO and LSST site.

A Project Team might involve 14-18 people and take 6-7 years. If the Team were based in NY and the operations team were based in NY, there would be an approximately steady-state presence in NY. Say half the project were based in NY, estimate \$40m over 6 years and total of >100 jobs in NYS. If Education/Outreach funding could also be brought in due to telescope, could present serious case to Albany.

The typical timescale of telescope development is as follows:

Years 1-5

- MOU between institutions (non-agreement could tear apart)
- Quarterly meetings of Board of Directors
- Founders contribute funds for initial partnerships and concept development (e.g., annual dues)
- Additional Partners solicited – could possibly include non-NY institutions while still retaining control
- Meetings with Institutions and Government

Years 6-11

Full Partnership determines design and construction

Year 12: First Light

At this point, not a surprise that not ready to commit. NYAC needs to gather more information toward decision

- Better Design & Cost
- Likely Scope of Partnership
- Probability of Funding

This will take ~1 year of focused work to develop prospectus/book outlining design, cost estimate, science case. This document can be presented to people. NYAC is unlikely to have the money to hire from industry to do this. A possible model is to have ASNY partners propose teams of Professor/Grad Student with industry partner. ASNY awards ~\$20k for each study. A target could be the SPIE in the Netherlands in Summer 2012 – could try to have a presence at this conference. We'd have to be fast to do this, but this might raise project awareness.

Discussion following Tom and Stefi's presentation:

- What might an NG-CFHT collaboration look like?
  - We would be ceding leadership. There are 100 people in technology at Herzberg and they want to do the engineering themselves. NYAC would be a significant minority presence.
  - TMT is top Canadian priority right now, but in funding crisis. They want a smaller project and they have a huge organization to keep going. Their telescope would fill similar role as ATNY. If we discussed with Canada, we need to know our bottom line.
- Who else would be a good partner if half of work is in NY? MA? New England?
  - Boston universities are in GMT already
  - NOAO seems interested, but no money.
  - Everyone is having same problem. US is in Gemini, GMT, but no money.
  - Florida might be interested
- Note that operations capital is just as hard, if not harder, to fund than construction.
- We have to explore NY, where we have a big budget: \$100 billion. On that scale, ATNY is small cost to NY. It would mean economic help for upstate NY. We need to sell it right away – let government know

that although the telescope is out of state, the parts must come from NY and all colleges will participate. We need to keep presence in NYS afterwards. The telescope will be remotely operated, but we will have remote operation center, maybe centers at every single college. Need to talk to university presidents, representatives to sound them out.

- How to figure out how to fund costs of studies should be taken to NYAC Board. Money required for technical studies, but also to support travel to meet with influential people in the state. We can take a two-pronged approach - political and technical – and see where we are in a year. Colleges and universities can put in some seed money. Members contribute money to kick-start, Associate Members contribute what they can. Convince administrators that investments such as this do come back.

**Stan Metchev summarized the Stony Brook share of 5m Hale telescope at Palomar.** Stony Brook reached a 3 year agreement to lease the 5 m for 22 nights a year. The goal was to have a cost-effective, short-term way to do exciting research. Palomar was identified as the most cost-effective. The 3-year agreement is 50% funded by private donations to Physics and Astronomy department (hardest to do), 25% from VP for Research, and 25% from the Provost (this was because Physics and Astronomy had already committed 50%). Observing is onsite, great instrumentation. Internal TAC consists of all observing faculty, students, postdocs. The agreement expires in 2014. Stony Brook also considering share on other telescope, e.g., Gemini or Magellan, or the Discovery Channel Telescope (4m). Following discussion pointed out that such an arrangement could work for ASNY. Fred pointed out that SMARTS is also always looking for new partners. Currently the consortium is short on money and may have to close down in January. Costs are \$1200/night to observe onsite, \$1600/night for a service observer.

**Rose summarized the status of WIYN.** WIYN is currently divided as follows:

26% Wisc  
17% UI  
17% Yale  
40% NOAO

They are looking for another 10-15% partner (current partners will take less time). A one degree imager is planned. Costs are \$2mill for every 10% up front; ~\$400k/yr operating costs for 17% share. Costs will go up with the one degree imager to total \$1.2-3mill/yr. Also opportunities for informal partnerships of small numbers of nights. The advantages of such an arrangement are that it attracts students, remote observing is available, free lodging onsite in WIYN house, domestic travel. Following discussion:

- Could ASNY serve as a broker for those that want to buy in? As opposed to individual colleges, e.g., perhaps colleges who want to join contribute \$3-10k/year, ASNY represents them? Joel noted that RIT is a member of “Little” WIYN and gets 6 nights/yr on the 0.9m at cost of \$500/night operations.

**Chris discussed how ASNY might join a consortium.** In order to do this, we would have to define what we need, what we might pay and then compare a given consortium with our needs. We could put together a small group to consider what we want, how to fund it, what we might pay. Present to the Board and they decide what makes sense. Then compare existing consortia to our needs. Following discussion:

- We'd have to form a TAC among ourselves, which would be good practice for large telescope. We would need to think of the balance of people desiring time. Stefi's example: ASNY could say there are 3 major science projects. If we had x nights on the 4m, allocate y nights to project and teams working on this. Stan said that Stony Brook competes large projects on par with everything else. Fred W. noted that 30 years ago, Lick split up time among faculty – 2 nights to do anything they wanted. Stan suggested an option might be to compete large programs only. Fred W. pointed out that universities putting in \$\$ will expect time, but as ASNY, we have to subsidize poorer institutions. Christina pointed out that we still have to figure out how do we best use the time. Hofstra looked at WIYN, but didn't take to administration because the \$ was too great for what they would get.
- Getting involved in a consortium is in line with committee report that consortium involvement would help build infrastructure.
- Need to decide on model for consortium involvement. If we go in as NYAC with open access, judge on basis of peer-review. But this might be hard to sell to institutions, who will expect to get back what they

put in. If we link intrinsically to ATNY, could imagine that small amounts of money from even small colleges could be used to investigate the consortium as a model for ATNY.

- Should be “socialistic” and support those without grants.
- If NY proposers are currently not successful, concern about future of ATNY. NY historically gets 0.9% for Gemini. However they may not be applying. The most successful proposers are from AZ and CA where they have facilities to do the ground work.

**Chris asked for ideas how to proceed.** Discussion:

- We form a committee of a whole, lay out strawman proposal, e.g., go for ATNY, with consortium model.
- We need to come up with substantive models for funding a consortium.
- Challenge membership to get detailed proposals.
- Have a consortium committee, and issue open invitation for membership.
- What about near-term vs far-term interests? Can we go to administration to ask for near-term support of consortium (e.g., Stony Brook in Palomar) and still ask for money for NYAC? Don't want to have competing interests. Yet NYAC is independent and may be relatively cheap to buy in to ATNY. Discussion of administration timescale – could couch as astronomy plan for near- and far-term. If studies utilize students from other departments, could get support.
- The consortium model probably not state-fundable. NYAC needs to decide level of involvement, size of telescope.
- There are multiple opportunities for consortium, need a process to decide what to do.
- Anyone can buy into SMARTS, for example, but they don't want to handle lots of small partners.
- There would be some cost to buying in and NYAC would put in some amount, e.g., \$20k. Decide what this money would support, e.g., undergraduates.
- Develop undergraduate involvement in project, like ALFALFA model.

Chris summarized above discussion: issue call for people to participate in a committee to explore various suggestions, models. Once approved by the Board, go through choice of consortium, if any. Stefi pointed out that may need flexibility, e.g., join consortium of about this size telescope, about this many nights, etc.

Discussion then turned to how to focus on ATNY.

- How to approach state?
- State will want universities to contribute.
- Lots of telescopes privately built.
- Buildings are good examples – 10 year plans.
- While trying to get a big donor, universities contribute. If donor comes in, good. If not, university backs out.
- Three committees should be formed: Technical, Funding, Consortium.

**Chris pointed out the 3<sup>rd</sup> recommendation from the Telescope Committee:** consider joining an ELT. Any other comments?

- Not clear what this adds, if we are considering consortium and building telescope, this recommendation is subsumed.
- Takes lots of money to get into ELT. Different constraints. For example, GMT: \$250m.
- An ELT is a nation-sized telescope. This is bigger than we are.
- CCAT is interesting. It will be a survey telescope and open to all. But similarly to LSST, what does it mean to be a partner? CCAT needs federal funding and they are against proprietary data. Also, we took survey for NYAC and no one said radio/sub-mm. How many responded? ~20% of NY astronomers (47 people).
- May do well to wait for NSF portfolio review. However this comes out next July. It will not be good. If there is a niche and we can get funding, do it. LSST wants \$9m next year, up from \$4m. If ALMA and LSST funded, no money left.

- Substantive risk in joining ELT
- Building own telescope is safer

Chris summarized: I'm not hearing any enthusiasm for joining an ELT. For now, drop and if interest in future, come back.

**Agreements from meeting:**

- Spend some money on technical studies to improve aspects of ATNY
- Form a political committee to make contacts and investigate funding
- Form a committee to investigate consortium idea
- Timescale: consortium could move on shorter timescale and so give consortium committee mandate to return quickly. Spring meeting? Political and consortium committees should be doable in ~6 months.
- Committees to be established via email call.

**Chairs appointed:**

- Technical: Stefi
- Political: Fred W.
- Consortium: Rose