

Evolution of the NOAO Time Allocation Process (Everything You Always Wanted to Know about the TAC)

Letizia Stanghellini

The NOAO time allocation process is a system-based process for allocating telescope time on facilities available to the US community through NOAO. Proposals are submitted to the NOAO Telescope Allocation Committee (TAC), based on science, and requesting as many telescopes and instruments as required for the successful completion of the science goals. In the last few years, the capabilities accessible through the NOAO TAC have greatly expanded, and we now offer a suite of 18 telescopes, including several 8-meter-class telescopes, providing more than 50 instruments and observing modes. This large selection of observing modes and capabilities allows proposers to choose the best match between science and observations, and it lets the NOAO TAC select the most meritorious science from the proposed programs.

In each of the past three years, NOAO has received approximately 1000 proposals. In order to monitor the proposal selection, we ask the proposing teams to choose a science category from among a list of nine extragalactic, ten Galactic and resolved stellar populations, and five solar systems ones. The science categories are used primarily to match the proposal to the reviewers. Semester after semester, we receive approximately the same mix of science topics, as seen in figures 1a–1c. The spread across the categories is the basis for panel recruitment, and the constancy of that spread reassures us that the five-semester tenure in the NOAO TAC is a good match to the expectations. There are notable exceptions of course—see the recent rise of extrasolar planet proposals in figure 1c—that are taken into account each semester by adjusting the panel recruitment accordingly.

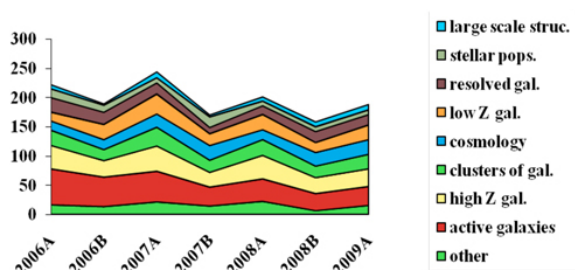


Figure 1a: Proposals submitted by science category (extragalactic astronomy).

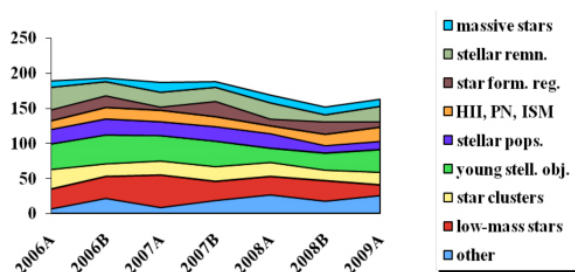


Figure 1b: Proposals submitted by science category (Galactic astronomy and resolved stellar populations).

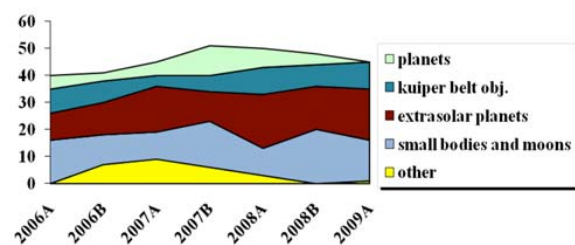


Figure 1c: Proposals submitted by science category (solar systems).

The proposal pressure, measured as nights requested over the nights available, depends mainly on aperture size. Figure 2 shows the proposal pressure in 2009A, which was typical for telescopes offered through the NOAO TAC. The high subscription rate of Kitt Peak's Mayall 4-meter (KP-4m) telescope, due to the recent deployment of the NEWFIRM wide-field infrared imager, demonstrates that new capabilities increase demand. The low oversubscription of the Magellan telescopes likely is due to small number statistics.

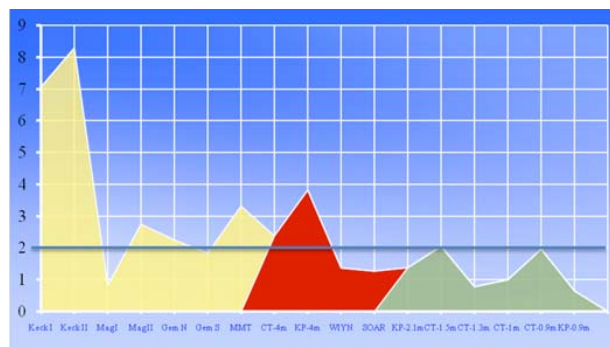


Figure 2: NOAO proposal pressure in 2009A. The horizontal line indicates the 2:1 oversubscription.

Each semester we hold a panel review for proposal selection. There are seven subject panels (three Galactic, three extragalactic, and one solar systems) whose members are carefully selected within the North American—United States, Canada, and Mexico—astronomical community. We make good use of the expected mix of subjects, as seen in figure 1, and we endeavor to represent the astronomical community within each panel, tracking seniority, diversity, and technical expertise. In 2006, AURA held an ad-hoc review panel to discuss how proposals, in particular those requesting the Gemini telescopes, were handled by NOAO. The outcome of the review was very favorable to the NOAO TAC. The panel recommended that reviewers be chosen who have broad scientific expertise, and that panel chairs be chosen preferen-

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tially from the broad community rather than from NOAO. NOAO responded to these recommendations from the review panel, and now we routinely have five or six of the seven panel chairs from outside the NOAO staff each semester.

Proposal assignment is based on scientific expertise, but there are other criteria that should be applied as well. In particular, personal conflicts-of-interest are cleared before proposal assignment. Secondly, all proposals requesting each of the public-access times to the external telescopes (MMT, Keck, and Magellan) go to a single panel of the appropriate discipline (Galactic, extragalactic, or, obviously, the only solar systems panel) so the resulting rank list is sizeable. Gemini proposals are split roughly evenly across panels and, together with the other 8-meter-class telescope proposals, are discussed with special attention within each panel, as recommended by the AURA review.

Panel members have typically three and a half weeks to read and grade proposals. During this time, each panelist is encouraged to disclose all conflicts with proposals he or she is reviewing, including conflicting proposals submitted to the same TAC. We are always available during this interim to reassign proposals and act in the best interests of the proposed science. Each proposal is assigned to a Lead Reviewer, but it is read by all panel members (five in each panel) and graded by all. Preliminary grades are not used to triage proposals, because our TAC reviews all submitted proposals. Most fall semesters we also hold a Survey TAC, which now functions as a regular TAC panel, with the difference that its membership is based on the Letters of Intent to avoid conflicts and select the best science match. We plan to introduce the option of applying for Gemini time in Survey programs, as recommended by the AURA review.

The TAC meetings are held at Tucson NOAO headquarters. The collegial atmosphere of the NOAO patio and nearby restaurants is very conducive to the TAC deliberations, where astronomers can see their friends and colleagues informally at breaks and lunches. While the feedback that I get from the panels is very positive about the logistics and spirit of the TAC, we are working at capacity, and an external site might be the choice to compact the schedule and workload for the support team. A science and policy orientation is held before each panel group meets—our current schedule groups the three Galactic, the three extragalactic, and the solar systems panels on different dates—and includes a question and answer session and brief presentations from the KPNO, CTIO, and NGSC directors, which are focused on the novel observing modes and instruments.

The actual panel review is a complex process with the very simple goal of realizing the best science possible given the current set of proposals and capabilities. In order to focus on their many charges and duties, panel chairs are exempted from discussing and grading proposals, which is different from many other TACs. Although the large number of telescopes and instruments offered by NOAO can increase TAC entropy, the benefit of undistracted, knowledgeable chairs has proved an ideal solution for the NOAO TAC. Parallel Galactic (and extragalactic) panels typically deal with slightly different areas of astronomy, according to the member expertise. For example, Galactic subjects are subdivided into (1) star forming regions, young stellar objects, and massive stars; (2) star clusters, stellar populations, and abundances; and (3) stellar remnants, low-mass stars, and chemical evolution. Each panel has enough scientific breadth to deal with other panel

subjects for the occasional personal conflict. These subdivisions foster excellent science discussions in all panels. The solar systems panel gets too few proposals to be split successfully into multiple panels; in this case, we make sure that the panelists can deal with the occasional personal conflict of other members. Chairs of parallel panels meet privately on the second TAC day to resolve intra-panel issues, such as the occasional panel chair conflict (a parallel chair would sit on the panel of the conflicted chair to bring the panel consensus to the Merging TAC).

At the end of the panel review, we hold the Merging TAC where the scientific program recommendation to the NOAO director is finalized. I chair the Merging TAC; the other Merging TAC members are the panel chairs, including the Survey panel chair, and the KPNO and CTIO directors who participate to clarify scheduling issues. A separate merging TAC is held to build the Gemini schedule, and is chaired by NOAO Gemini Science Center Director Verne Smith. During the merging TACs, the merged ranked lists of proposals are discussed and adjusted if needed. Proposals requesting more than one telescope (see figure 3) are discussed to make sure they either get all the requests, or that there is sufficient scientific potential in partial allocation. Multi-telescope proposals are more than 10 percent of the total proposals. We try to allocate the full requests by the proposers, if the TAC ranks the proposal highly, and cut nights only in exceptional circumstances. The Merging TAC also finalizes the long-term recommendations; long-term status is approved exclusively when scientifically justified. The final product of each merging TAC is a suite of ranked lists, one for each telescope, to be reviewed and approved by the NOAO director before they are given to the schedulers. Schedulers of all telescopes offered strive to follow TAC recommendations.

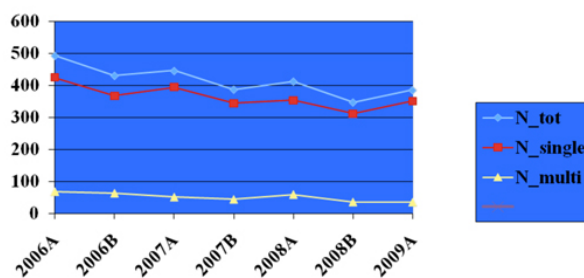


Figure 3: Number of single- or multi-telescope proposals.

Figures 4a and 4b show the proposal size for programs requesting small-aperture (<5 meters) and large-aperture (>5 meters) telescopes, respectively, in the past few semesters, including survey programs. For small apertures, most of the science programs consist of medium-size observing runs (three to six nights), while most large-aperture programs are very short, with almost no large-telescope programs scheduled for more than five nights. This is not a science selection effect, as similar plots on proposed science would look very similar. Instead, this is due to sociological effects (the perception that large-telescope time is very hard to get) and also to the fact that no survey programs so far have been implemented to observe with Gemini and the other large telescopes. We would like to remind proposers that while the nights with Keck and other Telescope System Instrumentation Program telescopes are very oversubscribed, the relatively large allotment of public US Gemini time allows larger programs to be suc-

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cessful, and teams are encouraged to submit larger programs for these telescopes when justified by the science goals.

The NOAO TAC provides critical feedback to all proposers (the “comments”). The contents of these comments are drafted by the lead reviewer, discussed during the panel review, checked again by the panel chair to make sure that they captured the panel discussion, and checked finally once again after all schedules have been completed. Proposers should be aware that past comments are available to panel members on resubmitted proposals, and proposals that incorporate answers to previous TAC comments are typically well received. We endeavor to produce the best and fairest comments for all proposals and to have all proposals reviewed fairly and competently. My personal experience with managing the TAC is that the level of scientific discussion is very high, but occasionally the comments have not risen to the same level. New steps have been taken to improve the comments even further.

While managing about a thousand proposals a year, we only receive one or two complaints over the approved scientific program. Of course, as a primary investigator, I totally understand that sometimes the TAC might seem like a black box, which produces an unsatisfactory outcome (when our great proposals are denied time!). For all our colleagues who have felt that way, I warmly suggest you take a look at the oversubscription rates, and also that you each volunteer for the NOAO TAC, or talk to your colleagues that are or have recently been NOAO TAC members (TAC membership is published every semester in this *Newsletter*). Once you sit on the TAC, you will better understand its workings and, hopefully, feel more confident about the fairness of its outcome.

Once the TAC process is complete, another complex set of activities begin: scheduling the highest ranked proposals. This scheduling process will be described in the next issue of the *NOAO/NSO Newsletter*. ●

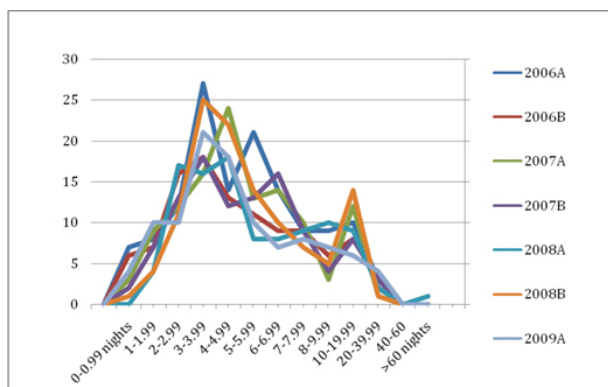


Figure 4a: Size of scheduled programs, small apertures.

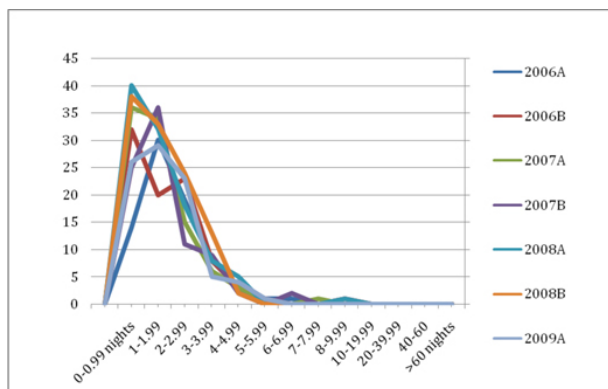


Figure 4b: Size of scheduled programs, large apertures.