1992ASPC...26..599W

Seventh Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun
ASP Conference Series, Vol. 26, 1992
Mark S. Giampapa and Jay A. Bookbinder (eds.)

ON SELF-LICKING ICE CREAM CONES

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Based on my experience as a Washington bureaucrat for most of the past decade – both within the Pentagon and until a few weeks ago in the White House on the National Space Council – I've been asked to close this conference with a few words on politics. As we discuss a host of exciting new possibilities for space experiments and observatories, it is important to understand the obstacles standing in our way. And, if at all possible, we must devise strategies to work around these problems.

In this short discussion, I will start with some problems which are beyond our control and move to discuss some which we have some potential to address.

Keywords: Ice Cream Cones; Pork; NASA; Mafia; Congress

PROBLEMS, NATIONAL, THE BUDGET PROCESS

Some of the current difficulty with the civil space program stems from the budget process. First and foremost, the current budget cycle prevents fast action. To understand this, let's review the process.

Sometime in the spring of 1992, NASA's Comptroller will send out preliminary guidance for Fiscal Year (FY) 1994 (Starts in October 1993) to each Associate Administrator, for example the Associate Administrator for Space Science and Applications (OSSA). They, in turn, will task each directorate (such as Astrophysics) to prepare submissions. Over the summer, these submissions will be refined, ultimately by the NASA Administrator for submission to the Office of Management and Budget (OMB) in the White House in early September 1992. During the fall, OMB will try to balance the budget and consider how to (almost always) cut NASA's request. In early December, OMB will "passback" their budget guidance to NASA. About one week later, the NASA Administrator can appeal these decisions in a one-hour meeting with the President. This appeal rarely works, and almost never involves science missions.

The President's FY 1994 budget will be submitted to Congress in January 1993. After solemn declarations on the part of Congress that it is a ridiculous proposal, Congress will begin its deliberations in March 1993. These deliberations are divided into two parts – the authorization process and appropriations process. In principle, the authorization committees decide what

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NASA will do and the appropriations committees decides how much money NASA will get. In practice the authorization committees are virtually powerless.

NASA's authorizing committees, particularly in the House of Representatives (The Committee on Science, Technology and Space), are very supportive of science programs. They usually pass on NASA's proposals with minimal cuts. Unfortunately, they usually take all summer to make their decisions. Once the Senate and House pass their independent authorizing bills, they are reconciled in conference and passed by the full Congress. In the last few years there has not been a NASA authorizing bill passed by both houses of Congress.

The real power lies in the appropriations committees. Here is where the problem is. The appropriations committee is divided into 13 subcommittees. Particularly in the House, where spending bills originate, the Chairmen of each subcommittee (the "Thirteen Cardinals") make all of the decisions. This is where the "pork" is larded onto the bill. For example, NASA's bill last year included a variety of parking garages and other foolishness in appropriations committee members' districts. A serious problem for NASA in the appropriations process is that it is handled by the HUD, Veterans Administration, and Independent Agencies (includes NASA, EPA, NSF, etc.) Subcommittee. With about $70 billion to spend and being required to compete, NASA versus these other, far better vote-getting programs, the possibility for increases in NASA budgets is small. About June 1992, after only one or two subcommittee hearings, the appropriations subcommittees will "mark up" the NASA program. In September they will conference with the other house of Congress and we'll have our FY 1994 NASA budget. Although this budget is supposed to include only a top-line number, it includes detailed management instructions which NASA slavishly adheres to in the form of "report language."

This process is almost impossible to manage. Appropriations bills are almost never vetoed by the President, so once the White House sends its budget to Congress there is little chance for the Administration to affect the outcome. The one time the authorizing committees challenged the appropriations committees on a NASA issue and won was last summer in the House of Representatives. Unfortunately, the success involved trading science programs for the Space Station.

This unfortunate train of events has resulted in a NASA which, more than any other agency, believes it works only for the appropriations committees. The senior staff of those committees, who have little interest in science or space, effectively run NASA. NASA senior officials' noses are usually found at waist level near these committee staffers.

While there is little that the astronomical community can do to affect this process, the best hope is to recognize where the power is and attempt to form one's own interaction with Congress, and in particular appropriations committee members and staff.

PROBLEMS, CLOSER TO HOME, NASA

"The Self-Licking Ice Cream Cone"

Since NASA effectively works for the most porkish part of Congress, it is not surprising that their programs are designed to maximize and perpetuate jobs

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programs in key Congressional districts. The Space Shuttle-Space Station is an outrageous example. Almost two-thirds of NASA's budget is tied up in this self-licking program. The Shuttle is an unbelievably costly way to get to space at $1 billion a pop. The Space Station is a silly design. Yet, this Station is designed so that it can only be built by the Shuttle and the Shuttle is the only way to construct the Station. Furthermore, the Shuttle has to be "improved" to support the Station with a new solid rocket motor which is to be built *you guessed it* in the district of the Chairman of the House Appropriations Committee. Since there are tens of thousands of jobs tied up in these programs and most of NASA's budget as well, there is not only no money to get out of this endless do-loop, there are positive political pressures to make sure that we don't get out. Witness the fact that not even $175 million could be found out of NASA's $14 billion budget to develop a new, cost-effective launch system. The appropriations committees effectively zeroed programs to develop this new launch system.

Lest we think the science programs are any better, consider the Hubble Space Telescope. It now absorbs almost half of the astrophysics budget ($400 million out of $900 million). Who would doubt that we could develop for this money, and in short time, a series of one or two meter-class instruments for placement at geo-synchronous altitudes. One could be launched every year. But there is now built-in resistance to this in the form of such institutions as the STScI, which just happens to reside in the district of the Chairman of the Senate appropriations subcommittee in charge of NASA.

"Inmates Running the Asylum"

NASA's vaunted "peer review" process is not a positive factor, but an example of the "pork" mentality within the scientific community. It results in needlessly complex programs whose primary objective is not putting instruments in orbit, but maximizing the number of constituencies and investigators, thereby maximizing the political invulnerability of the program.

NASA's proposed Earth Observing System (EOS) is a perfect example. Everyone agrees that the best way to conduct a scientific program – particularly one with a time-urgent objective such as finding out whether, and how bad, global warming may be – is with a series of rapid, small experiments in space. Yet NASA developed its mammoth EOS platforms, at almost 15,000 kilograms each, the largest, costliest and most complicated scientific instruments ever constructed by man. NASA's first step was to ensure that 500 principal investigators were chosen and that each understood his instrument would only fly if all flew together. Needless to say, this arrangement has made it almost impossible to move in a sensible direction.

"Mafia Tactics"

As with any monopoly, NASA is given to resorting to threats and intimidation when challenged. But, as programs grow less defensible on engineering and scientific grounds, NASA has carried these tactics to levels far above any other government agency. There is not an astronomer who hopes to get data from a NASA satellite, nor funding on a NASA program who does not feel this pressure.

The EOS is a case in point. About a year ago, encouraged by criticism from some quarters of Congress and in the press, some scientists and satellite

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contractors began proposing small, cheap, near-term alternatives to the EOS "battlestars." Senior NASA officials conducted, with impunity, an unbelievable campaign of threats against these critics. Members of White House advisory committees were told they would not get NASA funding if they continued to probe the program. Contractors were told they would lose other programs if they presented their ideas. Some scientists were actually denied funding on unrelated programs as a result of their public criticism of EOS.

SOLUTION, SELF-POLICING

"Faster, Cheaper, Better"

Technology exists, today, to do essentially all of NASA's scientific missions with "smallsats" systems weighing less then 1000 kilograms, costing less than $60 million, and taking no more than 3 years to construct. Even large satellites can be done on this time scale. In the late 1980s, my predecessor, now the NASA Associate Administrator for Exploration, developed, built and launched three medium-class satellites (4000 kg) in an average of 20 months from initial concept to launch.

The scientific community should insist that all NASA new starts be completed in three years. Those ongoing programs not meeting this requirement should be cancelled. In this way, a satellite program could be given – lock, stock and barrel – to a single scientific investigator and institution to conduct under their own full control. This would include contracting for the satellite bus and launch vehicle.

"Shoot the Sick Horses, and their Trainers"

It is outrageous that the Hubble disaster resulted in no repercussions. All we hear is that some un-named technician, no longer working for the contractor, made a mistake in the early 1980s. Even in the Defense Department, current officials would lose their jobs over allowing such an untested and expensive system to be launched.

It is time to start over on Hubble. It is not fixable. Its performance will not be corrected. The key instruments have failed and the satellite itself has far more problems than will be repaired in one, or even two Shuttle missions (at $1 billion each, I might add). Let's turn it off, start over, and do it right. Let's ask ourselves if the half-dozen magnificent spectra we have gotten (and will get no more of) are worth the literally tens of millions of dollars each they have cost.

Competition

The scientific community should insist on competition. New starts should involve at least two fundamentally different approaches. Success stories in American science and technology in the past have almost always involved several competing approaches being pursued simultaneously.

For its part, the Administration is trying, over NASA's strenuous objection, to develop competing space science programs. The Department of Energy is trying to establish its own civil space effort. This is an idea which should

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be warmly embraced by space scientists – to include encouraging Congress to support it. Further, there is no reason that NSF shouldn't do space missions. As mission costs descend into the few million dollar range, which technology shows they will, long-term university observatories could as easily be in space as they are on nearby mountains.

CONCLUSION

We can and must put our house in order. Despite national organizational problems, we can have an exciting space science and space astronomy program within even the limited resources we have. They key is to insist on fundamental changes in the way NASA does business.

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