

# Advisory Committee Origins of the Space Telescope Science Institute

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Scientific advisory committees have played important roles throughout the entire history of space research. They have provided effective mechanisms for communicating the views of the scientific community to federal science agencies, especially NASA, and for helping agencies obtain expert advice, and those functions have measurably enhanced the quality and productivity of the agencies' programs. A 1976 committee that was charged to examine institutional concepts for the operation of the Space Telescope provides an interesting case study of this advisory process.

In the early 1970s, NASA and space astronomy advocates in the scientific community were trying to build a case for starting development of the Large Space Telescope. While most of the activity focused on design studies for the proposed flight hardware, NASA officials also began to consider approaches for operating the telescope once it could be launched. The mission was expected to have a 10 to 15 year lifetime during which it would operate as a facility that would serve many users and produce unprecedentedly large volumes of data. Thus the post-launch scientific aspects of the program would be formidable and would include activities such as evaluating proposals for observing time, establishing observing priorities, scheduling telescope operations, and generally serving as the primary interface with the scientific community.

Two competing concepts emerged, and they generated lots of heated debate. NASA's initial preference was for scientific operations to be co-located with the engineering control center for the spacecraft and telescope at a NASA facility. This was the strong, basically unyielding, preference of officials at the Goddard Space Flight Center, where management responsibility for development of the telescope's scientific instruments and for flight mission and data operations had been assigned. Outside astronomers could play an advisory role, but Goddard people were convinced that their experience with earlier multi-user astronomy missions, in which NASA had end-to-end control and in which outside astronomers participated as guests, demonstrated that was the way to go.

On the other hand, outside astronomers in the broader scientific community were equally convinced that scientific operations of the telescope should be outside NASA's control. Many in the scientific community felt that NASA could not be trusted to work fairly on behalf of all astronomers or to remain committed to the long-term scientific value of the telescope. So the astronomers' alternative was an independent scientific institute that would be managed by an outside organization, such as a consortium of universities. The concept was not especially new. For example, in 1966 an ad-hoc NASA Science Advisory Committee had recommended establishment of a lunar science institute. That idea subsequently led to creation of the Lunar Science Institute that was initially managed by the National Academy of Sciences through Rice University and then, beginning in 1969, by a new consortium of universities—the Universities Space Research Association. The concept was also familiar to astronomers who had experience with the Association of Universities for Research in Astronomy (AURA) through which the Kitt Peak National Observatory complex of telescopes was managed for the National Science Foundation.

Thus, by the mid-1970s, the terms of a battle were clearly drawn. Would scientific aspects of the telescope's operations be controlled by NASA along with the rest of the telescope's operations—possibly with some advice from participation by the scientific community—or would science operations be separate from the traditional functions of the space mission control center and controlled by an independent scientific organization? Astronomers outside NASA strongly adhered to the latter, and some NASA managers began to warm to that approach as well. But others, especially at Goddard, held fast to the former, NASA-controlled approach. Noel Hinners, who was then serving as Associate Administrator for Space Science, already had his hands full dealing with challenges posed by the program's budget, plus a political fight to gain congressional approval for the program, plus continuing resistance from those astronomers who thought the project was too costly compared to the ground-based facilities with which they had always worked. He didn't need another battle with the scientific community at that time. Consequently, Hinners arranged for the National Academy of Sciences' Space Science Board to



## Members of the Study Committee on Institutional Arrangements for the Space Telescope

Donald F. Hornig (chair)  
Michael J. S. Belton  
Ralph Bernstein  
George W. Clark  
Arthur D. Code  
W. Donald Cooke  
C. Chapin Cutler  
George B. Field  
John W. Firor  
Robert B. Leighton  
Edward Ney  
Louis Rosen  
Vera C. Rubin  
Wallace L. W. Sargent  
Stephen E. Strom  
William F. Van Altena  
E. Joseph Wampler

organize a study to examine possible institutional arrangements for the scientific use of the telescope.

Donald F. Hornig, who had just stepped down from being President of Brown University, was selected to chair the study committee. Hornig was a Harvard-trained chemist who had been a group leader in the Manhattan Project and who had served as Science Advisor to President Lyndon Johnson from 1964 to 1969. The 17-person committee (see sidebar) included both astronomers who had experience with space astronomy missions and others who were experienced with the operation of ground-based astronomical facilities.

The committee met for information collection sessions in Washington, DC, and at Goddard, and then they gathered for a two-week work session at the NAS study center in Woods Hole, MA. The luxury of having a study committee together for two straight weeks of discussion and report writing (free from email- and cell-phone distractions!) would be a rare luxury now, but it was not uncommon in the 1960s and 1970s.

The committee's report—"Institutional Arrangements for the Space Telescope"<sup>1</sup>—was a remarkably thorough assessment of plans for the Space Telescope (ST),<sup>2</sup> experience with other space and ground-based observatories, factors relevant to whether an institute was needed, and options for the structure of an institute. The committee's unequivocal core recommendations included the following:

- \*\* The productive use of the ST depends upon the safe, reliable operation and maintenance of the spacecraft and its associated communications and data-processing systems, and upon the quality of the astronomical research which is conducted with it.
- \* Whereas the operation of the ST and its associated systems is best carried out by NASA, optimum scientific use of the ST requires the participation of the astronomical community.
- \* An institutional arrangement, which we call the Space Telescope Science Institute (STSI),<sup>3</sup> is needed to provide the long-term guidance and support for the scientific effort, to provide a mechanism for engaging the participation of astronomers throughout the world, and to provide a means for the dissemination and utilization of the data derived from the ST.
- \* We recommend that the STSI be operated by a broad-based consortium of universities and non-profit institutions... The consortium would operate the institute under a contract with NASA.
- \* We recommend that the policies of the STSI be set by a policy board of about ten people representing the public interest, as well as the astronomical community and the broader scientific community. The quality and independence of the policy board is essential to the success of this enterprise."

The report went on to discuss recommended scientific and operational functions, structure, governance, staffing, facilities, arrangements for interactions with NASA, and location of the institute. NASA largely accepted the Hornig committee's recommendations and after a competition to select an organization to create and manage the institute, NASA selected AURA, and the Space Telescope Science Institute (STScI) was established in 1981. STScI now sits in Baltimore adjacent to the Johns Hopkins University campus and slightly more than a one-hour commute from Goddard. The institute has been enormously successful, something about which both astronomers and NASA officials agree.

The Hornig report is a good example of an advisory effort that met NASA's needs and provided actionable advice that had a significant lasting impact. NASA's Noel Hinners wanted a way to resolve the conflict between Goddard and the astronomy community, he wanted independent guidance on how to maximize the long-term scientific value of the Space Telescope program, and he wanted to be able to build a positive relationship with the community that would shore up their willingness to be advocates for the program. Hinners probably also wanted cover; he had a good idea of what he wanted to do, but having a National Academy of Sciences committee behind him made his future decisions much more palatable. History suggests that he succeeded on all counts.

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<sup>1</sup>National Research Council, "Institutional Arrangements for the Space Telescope: Report of a Study at Woods Hole, Massachusetts, July 19–30, 1976," Washington, DC: The National Academy Press, 1976.

<sup>2</sup>Following the formal naming of the ST after Edwin Hubble, the acronym "ST" became "*HST*"—for the *Hubble Space Telescope*.

<sup>3</sup>"STScI" has now replaced the original acronym "STSI."