



Joan Lisa Bromberg. *NASA and the Space Industry.* Baltimore, MD: Johns Hopkins University Press, 1999. x + 247 pp. \$38.00 (cloth), ISBN 978-0-8018-6050-8.



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Dealing with NASA's Most Important But Least Valued Activities

Readers interested in space policy and especially the workings of NASA will be very interested in this well conceptualized volume. NASA conducts a number of activities in the space realm spanning human spaceflight, space science, and commercial activities. Most accounts of NASA's work focus upon the first two to the neglect of the third. Joan Bromberg provides an overview of the travails of NASA in fostering the commercial development of outer space. Until Sputnik flew in October 1957, no space industry by definition could exist. NASA, through its programs and initiatives, started the development process, drawing defense contractors in different directions than their early exclusive focus upon the Department of Defense. Her analysis focuses upon the broad contours of that effort, using case studies as examples of NASA interactions with the commercial sector and the fruits of those efforts.

NASA in her judgment has encountered great difficulties in remaining a significant player for a diverse set of reasons. First, the commercial sector as it matures moves in pursuit of its specific needs, ones that NASA does not necessarily encourage or desire. Second, NASA,

for reasons of its self-image and agenda, has lost leverage because the commercial sector perceives with some justification the agency as attempting to pursue its agenda of human spaceflight using their fiscal resources. Third, NASA's self image and behavior tracks that of an R&D organization with an engrained disdain for merely applied activities. In NASA's value hierarchy, commercialization ranks low always subject to the more critical needs of R&D. This can be seen most clearly in the struggles over commercializing the technologies that NASA has developed. The agency and its personnel have essentially been uninterested or insufficiently interested to make commercialization work systematically. This disinterest could be seen in the recurring reorganizations that have occurred, effectively reshuffling the deck chairs but not changing the agency's culture. Fourth, the agency's budget continues to recede so that the contractors (the core constituency of the space industry) seek other avenues especially the growing internationalized commercial sector. This means the agency is losing its ability to influence behavior.

The result, according to Bromberg, is an agency los-

ing the ability to influence its environment; critical players are too disaffected to accept NASA's leadership. The agency is not ineffectual just perceived as too excessively self interested to be trusted. Both Congress and the commercial sector hold this distrust. For example, the agency is perceived as attempting to entice the commercial sector to pay for the space shuttle's replacement, an option resisted by outsiders who are more focused upon economic viability questions than flying humans into orbit. Consequently, the X-33 program becomes more fragile technologically since the focus from NASA's perspective is not economics but continued assured access to space. This translates into pushing the envelope developmentally since operating costs are not central to NASA's concerns. Industrial views are ultimately and intimately driven by cost factors since at some point they must make a return to justify continuing. Bromberg in her analysis reinforces the perception of a government agency struggling to remain relevant in an era in which government is often thought irrelevant or counterproductive. In the space industry context, this struggle is sharpened by the recent boom in space-based communications applications. Entrepreneurs now perceive NASA as hindering progress rather than a technology enabler.

The larger insight provided by this volume is the role NASA played in formulating and directing the creation of a space industry. The agency along with the Department of Defense was central to that effort but the agency by the 1970s was losing control, a situation reinforced by the Space Shuttle Challenger accident in January 1986. The shuttle's failure forced commercial players to look elsewhere for space lift and, by extension, opened the door for competing views of how the field should be organized and operated. Since the Reagan administration, NASA has been under heavy pressure to be economically relevant in its activities. The difficulty was and is that there exists no clearly defined mechanism by which development and later commercialization or privatization of space technologies occurs. NASA perceives such transfers as someone else's problem or else an attack

upon the agency viability (remember in 1981, the rhetoric was abolishing the agency by eliminating its programs) while the private sector sees the agency as a hindrance and defender of the status quo. Joan Bromberg describes and analyzes these and other problems succinctly in a well-organized work.

The book is well researched, being supported by a NASA history grant, with access to archival materials not normally available or cited. The author does a fine job of bridging the problem of detail versus a larger sweep of events. Her thrust is to stay with the larger picture since that is the story rather than the obsessive focus upon individual events. The work amply illustrates the interesting fact that the space age is moving toward the half-century mark, meaning that some perspective is now being obtained. That will be especially critical over the next decade as NASA struggles to define itself in a world in which commercial space applications grow in sophistication, number and usefulness. Readers will come away with a firm grasp of the difficulties inherent in directing economic and technological change given the unknowns that exist in predicting the future.

That future includes an expanding internationalization which further undermines NASA's efforts at directing the future of the American space industry. When NASA began in 1958, the goal was American dominance over commercial space, those days are now numbered, meaning the field is in flux with multiple players pursuing separate agendas. NASA's focus now becomes carving out a niche that facilitates the opportunity to pursue the human exploration and exploitation of outer space. That quest permeates all its activities as this volume amply documents.

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