
SCIENCE & TECHNOLOGY

Space Chic?

"Space Science, Space Technology, and the Space Station" by James A. Van Allen, in *Scientific American* (Jan. 1986), 415 Madison Ave., New York, N.Y. 10017.

Outer space has long been an American obsession. Indeed, even as President Reagan vowed to reduce a \$185 billion federal deficit, he pledged (in his 1984 State of the Union Message) continued support for efforts to launch a manned space station by 1993.

Yet Van Allen, an astrophysicist at the University of Iowa, considers space stations, and the U.S. manned space program, to be wasteful. The National Aeronautics and Space Administration (NASA), he argues, could get more for its money by using unmanned spacecraft: "Apart from serving the spirit of adventure, there is little reason for sending people into space."

To date, NASA has spent some \$30 billion on a Space Transportation System that now includes four manned space shuttles. This project, too, is only the first phase of what the U.S. National Commission on Space calls the "infrastructure" required for Americans to explore, and eventually colonize, the inner solar system. On the drawing boards are a fleet of shuttles as well as three space stations, designed to orbit the Earth, the Moon, and Mars. The dollar cost will run into the hundreds of billions—if not trillions.

Advocates of the manned space program predict great economic returns, both from specialized manufacturing in space and the deployment of satellites. But Van Allen is not persuaded. Those same proponents argued during the early 1970s that, within a decade, the U.S. shuttles would take over the cargo-carrying role of "expendable launch vehicles" (e.g., the Scout, Delta, Atlas, and Titan rockets); 50 shuttle flights per year would carry payloads for only \$100 per pound. In reality, the 10 shuttle flights of 1985 transported materials at a cost of \$5,000 per pound (\$2,000 in 1971 dollars). Moreover, the great expense of the shuttle program—which currently consumes two-thirds of NASA's budget—has forced the delay or cancellation of other space ventures, including unmanned probes to Jupiter, Venus, Mars, and the Sun.

Van Allen notes that manned spacecraft have inherent technical drawbacks, such as bulky life support systems and safety requirements. Leaving man behind, robots and radio-controlled spacecraft will soon be versatile enough to repair damaged satellites and assemble equipment in near-zero gravity. Their computerized arms will not tire, contaminate their surroundings, or err as a result of stress. As for scientific experiments, warm bodies can even be a nuisance: "An astronaut's sneeze could wreck a sensitive experiment in a microgravitational field."

In further support of his case, Van Allen points to the financial success of telecommunications satellites, an unmanned venture. These satellites can stay aloft not only in the Earth's orbit but in the international marketplace—without a lift from U.S. taxpayers.