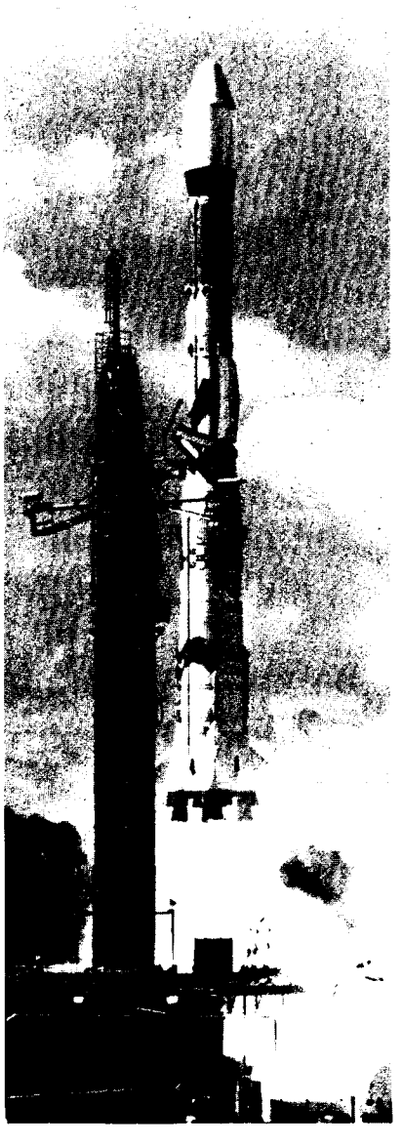
Ariane Is a Success

On 19 June the European Space Agency's experimental Ariane rocket lifted off its launchpad in French Guiana and arced eastward over the Atlantic, a graceful demonstration that the engine problem that spoiled a similar test flight last year had been solved. And when word came that Ariane had successfully placed a European weather satellite and an Indian-built communications satellite into geosynchronous orbit, ESA officials were exultant. "This means that space is no longer the exclusive preserve of a few powerful nations," said Michael Bignier, ESA's director of Space and Transport Systems. By 1983, after a series of promotional flights, the marketing, production, and launching of Ariane will be turned over to Arianespace, a profit-making company which hopes to deliver launch services at prices competitive with the space shuttle.

Last October, President Carter's Office of Science and Technology Policy asked the American Institute of Astronautics and Aeronautics to estimate the demand for commercial satellite launches through the year 2000. In a report made public in January, the AIAA task force projected a 10- to 30-fold growth in the traffic handled by communications satellites, as well as new demands for nonfederal payloads devoted to Earth observations, materials processing and manufacturing, and other research and development. AIAA concluded that commercial demand for space launches far outstrip the capability of the planned four-orbiter shuttle fleet. Even with Ariane as a competitor, NASA would be justified in building at least one more orbiter and greatly expanding its stable of expendable launch vehicles. (NASA currently plans to phase out its Delta and Atlas-Centaur launchers by 1985.)

Most users like the convenience of expendables, says NASA's director of expendable launch vehicles, Joseph B. Mahon. "They dictate the schedule, they're king." With the space shuttle, a user faces delays due to developmental problems or foul-ups that slow the orbiter's turnaround time on the ground. He might also get bumped by an urgent military flight.

On the other hand, users like the economics of the shuttle, Mahon adds. NASA currently charges about $25 million to launch a 2500-kilogram payload into low earth orbit aboard its Delta rocket. The price for a shuttle launch, where fees are meant to defray actual launch expenses but not development costs, would be about half that. A similar ratio holds for an Atlas-Centaur-class payload (6500 kilograms and $40 million). "It's created such a demand the shuttle can't handle it," says Mahon.



Third time lucky

Ariane lifts off.

Europe plans to grab some of that market with a vehicle that is, by ESA's own admission, "very conventional and mundane," an assembly of previously developed subsystems. Moreover, Arianespace, which is owned by ESA, 36 European aerospace companies, and 11 European banks, is willing to accept a slim profit. For Europe, Ariane means technological independence from U.S. launch facilities—not to mention an improvement in the balance of payments. Between 1969 and 1978, ESA paid some $200 million to launch its satellites on NASA rockets.—***M. Mitchell Waldrop***

Soviets Sentence Scientist to 5 Years in Exile

Viktor Brailovsky, a Soviet cyberneticist who helped organize the Moscow Sunday Seminars for scientists and was arrested last November on charges of "defaming the Soviet state and public order," has been sentenced by a Soviet judge to 5 years of internal exile. During the 1½-day trial, Soviet police barred all spectators from the courtroom except for Brailovsky's family and state-approved witnesses. Among those denied entrance were diplomats from the United States, Canada, and Great Britain.

The confrontation with Soviet authorities started in 1972 when Brailovsky and his wife applied for visas to emigrate to Israel. The visas were refused and both were later dismissed from their jobs. Between 1973 and 1979 Brailovsky helped edit an underground journal, *Jews in the U.S.S.R.* In response, Soviet authorities embarked on a campaign of harassment that ended in Brailovsky's arrest.

According to his wife, who attended the trial, four witnesses were called by the prosecution on the first day. One refused to testify, another said he could not remember evidence shown to him, and a third said he had never read the Jewish journal. The fourth state witness said that he had once attended a scientific seminar at the family's apartment that had dealt with mathematics and physics. The prosecutor alleged that participants at the seminar had discussed topics that defamed the state.

Before the trial started, AAAS executive officer William D. Carey sent a telegram to the judge and prosecutor. "We are dismayed," it read, "by the news of Doctor Brailovsky's arrest and charges under article 109/1 of the criminal code of the Soviet Union. We

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are extremely concerned about his situation and would respectfully urge that he be immediately released. It is our frank opinion that any action taken against Doctor Brailovsky resulting in his imprisonment or internal exile would deepen and extend the gap that has opened between Soviet and American scientists."

—William J. Broad

Percheron: Entrepreneurial Exuberance in Space

On or about 7 July, GCH Inc. of Sunnyvale, California, working under contract to Space Services Inc. of Houston, will test-fire the engines of its Percheron launch vehicle on Matagorda Island, Texas. A suborbital flight should follow soon after. By 1984, if things go well, Percheron will be carrying 1000-kilogram commercial satellites to geosynchronous orbit—at a fraction of the $30 million that NASA now charges. With the demand for launches soaring, SSI expects to make a mint. And with Texas oil money backing young California aerospace engineers, the scheme may be crazy enough to work. "We see no reason that either launchers or satellites should be as expensive as they are," says Washington representative Charles M. Chafer.

The Percheron project seems truly a child of the Reaganomic 1980's. SSI's founder and president, Houston businessman David Hannah, Jr., congratulates NASA on exploring the frontiers of space but asserts that exploiting those frontiers is better left to private enterprise. "We have organized to make space accessible to the private sector for industrialization and commercialization," he says.

SSI intends to get the capital investments needed for space industry down to levels consistent with other private ventures, such as oil and gas exploration. Hannah sees immediate markets in such things as privately owned earth resources satellites, which could provide their owners with proprietary information on, for example, mineral deposits. NASA must by law share its LANDSAT data with everyone.

The Percheron rocket is the brainchild of California's GCH Inc., headed by self-taught engineer Gary C. Hudson, 31. To keep launch vehicle costs down, Hudson and his team of 30-odd engineers have tried to design a system as simple and as modular as possible. The engines are pressure-fed rather than pump-fed, and they burn kerosene to produce 75,000 pounds of thrust. The basic Percheron module is 40 feet long; for heavy payloads the modules will simply be strapped together in clusters. The payload capsule, with its expensive avionics systems, will be recoverable. Percheron will use off-the-shelf technology throughout.

In response to suspicions that this whole thing is some kind of con game, SSI is inviting the press to its July test firings and launch. NASA, according to agency spokesman Charles Redmond, is impressed with the abilities of GCH's top engineers. "Most of the technical people in NASA are saying 'Full steam ahead,' " he says. "If this works, it means space isn't a luxury anymore."***—M. Mitchell Waldrop***

Rostow Confirmed as Hard-Liner Head of ACDA

Late on the night of 25 June, the Senate confirmed the nomination of Eugene V. Rostow, President Reagan's choice to head the Arms Control and Disarmament Agency (ACDA). As with most top civilians in the Reagan Administration, Rostow is a hard-liner on the Soviets and on the arms control agreements negotiated by previous administrations. "Our 10 years of experience with SALT I and SALT II have been painful and unsatisfactory," Rostow testified at his confirmation hearing. "Our first task therefore is to reassess the role of arms limitation agreements in our foreign and defense policy." The hard anti-Soviet line has not gone down with at least one group, the Federation of American Scientists (FAS), which strongly advocates arms control. In a letter to the committee that held the confirmation hearing, FAS said "We now see that the nominee is considerably more hostile to arms control even than this Administration and, in any case, shows not the slightest appreciation of arms control as we or anyone else defines it."***—William J. Broad***

Denis Hayes Fired from SERI

Denis Hayes was fired last week as director of the Solar Energy Research Institute. John McKelvey, president of the Midwest Research Institute, which runs SERI for the Department of Energy, said the action was taken "in order

to best achieve the redirection of SERI . . . consistent with the Department of Energy's revised solar program goals and budget levels."

The request for Hayes' resignation came on Sunday, 20 June, just 2 days after reports leaked to the press about DOE's plans to slash SERI's budget from about $120 million to $50 million. The ax would fall hardest on the research that SERI contracts to outside firms and on such activities as providing solar information to the public, supporting solar demonstration projects, and performing socioeconomic impact studies. SERI would be restricted to "high-risk, high-payoff" research—on photovoltaics, for example—performed mostly in-house. Hayes estimated that the proposal might eliminate as many as 350 of SERI's 950 staff positions.

Hayes said that the Reagan Administration does not understand solar energy and tends to think of it in terms of "Jane Fonda and Jerry Brown"—as a radical movement. He also accused Energy Secretary James B. Edwards of a "methodical campaign to destroy what I consider to be America's best energy hope."

Hayes was national coordinator for the first Earth Day in 1970 and for Sun Day in 1978, and was a senior researcher at the Washington-based Worldwatch Institute when President Carter appointed him head of SERI in 1979.***—M. Mitchell Waldrop***