

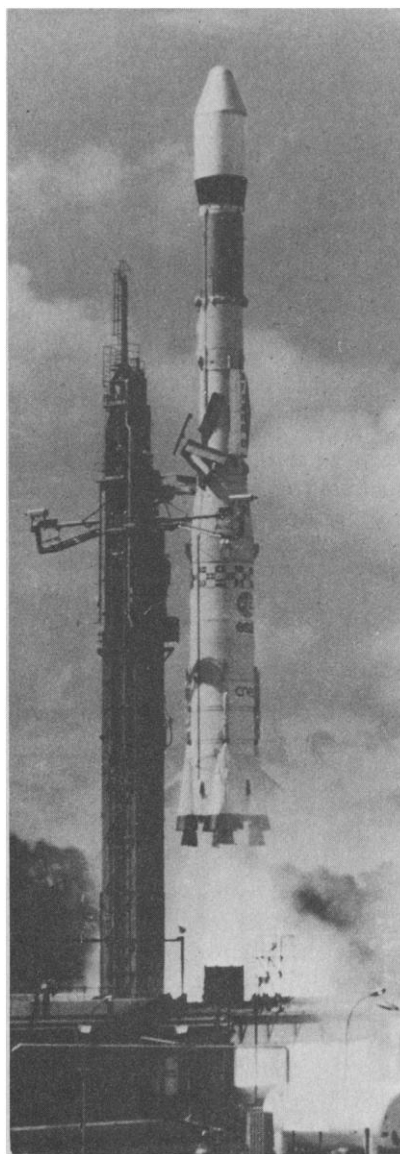
Ariane Is a Success

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



Third time lucky

Ariane lifts off.

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.

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