France Brings Space Goals Down to Earth

France has long been at the vanguard of Europe's space effort: It was the driving force behind the Ariane launcher program and the now-abandoned plans for a space plane to ferry European astronauts to and from the international space station and its European lab module Columbus. In the late 1980s and early 1990s, the French space agency (CNES) would see annual budget increases of 20%. But those heady days are now nothing but a memory. The French space program, like its German counterpart (see main text), has slid down the list of national priorities, and CNES is lucky to get a static budget from one year to the next. And it could get worse: Claude Allègre, the pragmatic new minister for research and education, whose remit includes space, has made it clear that, while his vision of France's role in space is substantial, it is much less grandiose than before.

The political message from the new Socialist government is that space policy must fit with its broader objectives, such as reducing unemployment, monitoring and understanding environmental changes, and improving industrial competitiveness. Allègre appointed a new CNES director-general, Gérard Brachet, last June and, says André Balogh, a professor at London's Imperial College, French scientists generally believe he was brought in to temper the traditional French enthusiasm for space. Indeed, Brachet has some tough marching orders. These include less emphasis on crewed space flight, better management at CNES and the European Space Agency (ESA), continued commitment to Europe's new heavy launcher (Ariane 5), high-quality science, a strong Earth-observation program, and possible collaboration with NASA on a sample-return mission to Mars in 2005.

Allègre has said France will honor commitments to the space station it made at a meeting of ESA's ministerial council in Toulouse in 1995 (*Science*, 13 October 1995, p. 224). France is due to contribute 27% of the $2.3 billion ESA is spending on the space station. But in an interview with *Science*, Brachet said there will be no extra money for the station in the future, and negotiations on the amount Europe pays toward the station's operations are likely to be tough. "We have no agreement yet on operation costs, and we are watching with care," says Brachet. Already, France has signaled its retreat from crewed space flight by pulling out of a European project to develop a crew-transfer vehicle for the station. Says one seasoned observer who does not wish to be named: "Allègre would be very happy if the space station would just go quietly away. They've bought an expensive mortgage, and now they can't afford to go out for dinner. It's frustrating for them."

While the station is a frustration, Ariane 5 is still France's jewel. France has funded more than 46% of the $7.5 billion development costs of Ariane 5, and CNES manages the project on behalf of ESA. Allègre sees the launcher as a cornerstone of an autonomous space policy that would free France from dependence on the United States. The loss of Ariane 5's first flight last year (*Science*, 14 June 1996, p. 1579) shook the French establishment. "It really was their Challenger," says one observer. Following the first successful launch last month, one more is needed for flight qualification, then Ariane 5 can be transferred from CNES to Arianespace for commercial operation.

However, CNES is now roughly half a million dollars in debt to ESA because it borrowed from the agency to keep Ariane 5 on schedule when other countries, principally Germany, did not fulfill their commitments to the project in the early 1990s. Allègre has been outspoken about his annoyance over this debt, which, says Brachet, CNES is now beginning to pay off. Allègre has also criticized ESA for poor management and inefficiency. He has plenty of incentive to tighten its operations: France provides nearly one-third of the agency's budget. The feeling among ESA's two big funders—France and Germany—is that ESA is not operating to their best advantage, so CNES is now working with its newly enlarged German counterpart, DLR, to develop a European space strategy and to suggest ways in which ESA could evolve.

The initiative comes at a time when Antonio Rodotà, ESA's new director-general, is carrying out his own agencywide strategy review in preparation for a ministerial council meeting next June (*Science*, 5 September, p. 1426). "Mr. Rodotà has his own approach," Brachet told *Science*, "but the member states will decide." By this Brachet undoubtedly means France and Germany.

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space scientists wrote to the research ministry last summer to express concerns about the shift of emphasis toward applied space research.

In July, Research Minister Jürgen Rüttgers declared that "Germany will continue as a driving force in European space efforts," but also will draw in industrial partners to help strengthen Germany's "technological and commercial competitiveness." Kröll says he generally agrees with the need to focus on space projects with potential commercial value. But he does not believe that the new emphasis will hurt basic research. "In all three main areas of basic space-science research—extraterrestrial, microgravity, and Earth observation and the environment—German researchers play a prominent role, and will continue to do so," Kröll says.

However, because DLR is known mainly for its applied research efforts, some space scientists are concerned that DLR may have too much control of setting the direction of space research. Before last month's merger, DARA took the lead role in prioritizing space research projects, while DLR mainly conducted research. While Lüst credits DLR for its "high-class aeronautical research," he maintains that Germany's best space research projects—such as the ROSAT X-ray astronomy satellite and its contributions to ESA's Infrared Space Observatory (ISO)—have emerged from Max Planck institutes or universities, with funding from national and ESA budgets. Lemke, who helped develop ISO, also told *Science* that his main concern with the direction of German space policy is "whether DLR will shift the emphasis too much toward applied science."

While DLR's scientists have done excellent work in such fields as Earth observation and microgravity research, much of its reputa-

MAJOR EUROPEAN SPACE BUDGETS, 1996

Nation	Space Budget as Percentage of Gross Domestic Product	Percentage of Budget for National Space Program	Percentage Increase or Decrease in Space Budget, '95 to '96
Germany	0.05%	25%	–11%
France	0.18%	62%	+21%
United Kingdom	0.06%	33%	+14%
Italy	0.06%	29%	–13%

SOURCE: GERMAN GOVERNMENT REPORT