U.S. firm contracts for use of USSR Mir

U.S. approval has been granted for an unprecedented collaboration between a U.S. firm and the Soviet government in which a commercial payload provided by the company will be operated by cosmonauts aboard the Soviet Mir space station. Discussions of the agreement began a year ago, but in late February a major milestone was passed with the company's receipt of an export license for its protein crystal growth equipment, granted by the Commerce Department and representing approval as well by the Department of Defense.

In seeking the export license, the company was facing concerns about "technology transfer"—the possibility of high-tech U.S. equipment falling into Soviet hands. "It's a low-tech device, with no electronic parts," says Vinit Nijhawan, director of business development for the firm, Payload Systems, Inc., of Wellesley, Mass. But to underscore the point that technology transfer would not be a problem, the firm included published Soviet research papers with the license application, showing that the USSR was doing protein crystallization studies already.

One of the company's cofounders is Byron K. Lichtenberg, who was a payload specialist aboard the space shuttle during the Spacelab 1 mission in 1983, where the research conducted onboard included growing protein crystals. The other cofounder is Anthony P. Arrott, who met Lichtenberg while the two were getting doctorates in biomedical engineering at MIT and who was involved with the Spacelab studies from the ground.

The deal was signed with Glavcosmos, the Soviet civilian space organization. Glavcosmos of late has been energetically attempting to market a variety of Soviet space services, from launchings to satellite photos of the earth.

Prompted by slowdowns in U.S. space station plans, due to tightening budgets as well as factors such as the Challenger disaster two years ago, Payload Systems approached Glavcosmos last March about the use of the Mir station, which can provide a microgravity environment for months rather than the week or so available on the shuttle. (To verify its equipment and methodology, Payload Systems has been leasing space on NASA's KC-135 jet aircraft, making brief periods of microgravity available as the plane flies through parabolic arcs.) The additional time is expected to make a significant difference in the ability to grow suitable protein crystals successfully. The contractual arrangement is "multi-year and multi-flight," says Nijhawan, with the company's apparatus staying aboard Mir for periods of "weeks to months," and with flights anticipated at a rate of about three per year.

Payload Systems is expected to be serving primarily as a provider of protein crystals to other companies, but it declines to identify its customers. Some pharmaceutical firms, for example, have high hopes for the possible payoffs of being able to analyze and possibly modify the structure of protein crystals grown in space, so the proprietary concerns of business are important. "The biotechnology revolution is different from the semiconductor revolution," says Nijhawan. The expansive growth of the semiconductor business, he says, was based on miniaturization, primarily a technological matter of being able to make things smaller and faster—"things that can readily be seen and copied." Biotechnology, however, he says, is based on the more wide-ranging potential of discovering new things.

Is Payload Systems' goal to grow as many different kinds of protein crystals as possible in search of unsuspected payoffs, or to concentrate on one or a few specific candidates? When will the first experiments be conducted aboard Mir? How large are the customers' investments in Payload Systems' output — a possible measure of their faith in the potential of the results? Neither party, for proprietary reasons, is answering such questions. The stakes could turn out to be high.

— J. Eberhart

EPA finds widespread asbestos hazard

An estimated one in five commercial buildings in the United States contains friable (easily broken) asbestos fibers—the type that poses the greatest human health hazard. These data, contained in an Environmental Protection Agency (EPA) study released this week, also show that of the estimated 733,000 buildings affected, 43 percent may have asbestos that is "significantly damaged" and therefore quite likely to become airborne.

The study, which surveyed a statistically representative sampling of 231 buildings nationally, found asbestos most common in large, residential apartment buildings: Almost 60 percent of those surveyed contained the carcinogen.

Despite these findings, EPA plans no new regulations for dealing with the problem within the next three years. The reason, explains EPA Assistant Administrator John A. Moore, is that there are barely sufficient resources now—in terms of money and trained professionals — for dealing with asbestos in schools. And according to EPA, completing the national asbestos-control program for schools deserves priority attention, both because of the mineral's greater prevalence in schools and because asbestos exposure poses a greater cancer risk to children than to adults.

For now, EPA Administrator Lee M. Thomas is recommending to Congress that the agency be allowed to spend $6.6 million more annually to increase the supply of asbestos-control professionals, to develop safe methods of repairing, encapsulating and removing asbestos insulation from heating pipes and boilers (the main source of asbestos in commercial buildings), and to beef up EPA's technical assistance and enforcement programs.

The Washington, D.C.-based Service Employees International Union, which calls this response "unacceptable," is pushing ahead on a lawsuit to make EPA require immediate asbestos surveys for all commercial buildings. Its goal is to help maintenance workers identify potentially hazardous work sites.

— J. Raloff

Is nonstick nontoxic?

The fluorine-carbon bond has long been respected as one of the strongest of all chemical links. With a little intervention from laboratory scientists, unique fluorocarbons can be produced that are highly inert and can withstand extremely high temperatures. The Teflon that is used to coat nonstick cookware is perhaps the best-known example of a fluorocarbon compound. Fluorocarbons have also proved useful in biomedical research, such as the development of artificial blood, in part because they were thought to be so biologically nonreactive (SN: 9/26/87, p.200).

But according to new research in the March 3 NATURE, some fluorocarbons may not be as stable as presumed. Scientists at the University of Glasgow, Scotland, report that perfluorodecalin—a major ingredient in the only artificial blood substitute to undergo clinical trials in the United States—and perhaps other fluorocarbons can react with organic molecules under surprisingly mild chemical conditions such as those found in biological systems. The discovery may make possible the construction of novel industrial chemicals with useful properties. However, the researchers say, the newly found reactivity calls into question the assumed nontoxicity of fluorocarbons.

A spokesperson from the Wilmington, Del.-based Du Pont Co., maker of Teflon, declined to comment on the new findings until company researchers had a chance to study the paper. □