

Feting Gagarin and 50 Years of Space Exploration

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April 12 marked the 50th anniversary of the first manned spaceflight, thrusting two Russians — astronaut Yury Gagarin and rocket designer and engineer Sergei Korolyov — into the global aerospace hall of fame.

Gagarin was literally the human face of Soviet socialism, an icon of hope in an era of Soviet leader Nikita Khrushchev's domestic "thaw" and warmer relations with the West. He went down in history as the first human in space and was followed by German Titov, the first man to spend more than 24 hours in space.

Then came the first "salvo flight": two rockets launched simultaneously with the intention of coordinating their flights in orbit. That was followed by the first pair of cosmonauts to fly together, and then the first woman in space, Valentina Tereshkova.

After former U.S. President John F. Kennedy's famous speech in May 1961, the United States

made spaceflight a national project, putting the first man on the moon in 1967.

In turn, Russia successfully operated a lunar rover on the surface of the moon. The Apollo-Soyuz project linked a Russian and U.S. spacecraft, and the docking maneuver between them became famous as a symbol of reduced tensions in U.S.-Soviet relations.

Later came U.S. shuttles and the Soviet Buran. Soviet cosmonaut Alexei Leonov took the first tethered space walk, and U.S. astronaut Bruce McCandless II then became the first to use a Manned Maneuvering Unit in untethered free flight.

For Russians, the spirit of the times made it natural to aspire to great feats. Russian boys dreamed of becoming cosmonauts. But Soviet space heroes had a tougher task before them than did their U.S. counterparts. If U.S. astronauts had to endure several days in space, Russian cosmonauts from the late 1960s onward spent months in orbit in cramped quarters, often experiencing extremely high psychological stress. They were also subject to far more grueling physical training, including thermal chambers, pressure chambers and centrifuges.

At the same time, cosmonauts received far fewer benefits and less medical attention upon returning to Earth. Nor was it easy to live in the isolated Star City compound with its caste-like system drawing a line between those who had flown missions and those who had not. For their part, U.S. astronauts also had a thorny and difficult gauntlet to run on their way to the stars. The program criteria were constantly changing so that from one year to the next, a person could never be sure whether he would fly or not. In this way, McCandless was selected after a wait of 17 long years, a heroic act of perseverance in itself.

Although the exact amount of money spent on space flight has never been determined, there have always been critics who maintained that the expenditure wasn't justified. But others argue that the economic gains in terms of new technologies, chemical experiments with pure materials, semiconductors, observations made in the meteorological, geophysical and geodesic sciences, astronomic measurements and the production of pure medicines are 20 times greater than the original investment.

To be sure, a number of Soviet space technologies were more advanced than their U.S. equivalents. These included accelerators, spacesuits that were easier to put on and take off, helmets that afforded greater visibility, gloved fingers that were easier to manipulate when grasping objects and catapults with higher survival rates. It is no surprise that when the Iron Curtain fell, U.S. firms Boeing, Martin Marietta, Lockheed and others rushed to begin negotiations for obtaining products from leading Soviet space production facilities and research centers.

Discussions about space have traditionally focused on its peaceful exploration, but there are two sides to space: civilian and military. Germany was the first country to develop a practical rocket during the Nazi era. The Soviet Union obtained the plans for the German V-2 rocket after the Allied victory in World War II and used them as the basis for its subsequent ballistic missile program, while the father of rocket science, Wernher von Braun, fled to the U.S.-occupied zone in Germany. As a result, the United States acquired von Braun's V-1 design, which became the progenitor of today's cruise missile. Incidentally, after decades working for the United States, von Braun experienced a change of heart and devoted the final years of his life to protesting the space-based arms race.

Most space technologies have both civilian and military applications. Intercontinental ballistic missiles were first tested in 1957, several years before Gagarin's flight into space. After that, the two countries became locked in a fierce arms race to outdo the other in producing missiles. In the heat of the race, both lost sight of when to quit. At the risk of sounding naive, I am convinced that the Soviet Union should have stopped in the late 1960s when it reached parity in terms of intercontinental missiles. In the first half of the 1970s, Moscow should not have followed the United States down the road of producing multiple independently targeted re-entry vehicles, the multiple warheads placed on missiles. That way, the world might have been more stable.

But space became militarized long ago. The deployment of observation satellites in space is actually considered a stabilizing factor because it allows countries to closely monitor one another's activity. The current discussion should therefore focus not on preventing the militarization of space, but on prohibiting the deployment of weapons in space.

The United States and Russia were successful in freezing the arms race in space in the mid-1980s, but that question is again gaining urgency as the United States considers a next-generation missile defense system using space-based weapons, while China has made significant steps forward in developing its anti-satellite weapons systems.

Fifty years ago, humankind's foray into space was only a possibility, but now it is a fact. Aside from answering the questions posed by human curiosity — the main engine driving science — space exploration offers the promise of new technologies and solutions to critical challenges facing the international community. Humanity will discover new worlds and will go where no one has set foot before, and in the process it will find new solutions to old problems. Fifty years might be only a small step in human history, but the exploration of space is a giant leap for mankind's development.

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