What Will It Take To Go Back to the Moon?

by Marsha Freeman, *EIR* Technology Editor

Dec. 17—President Trump has put a vision for the future of space exploration before the American public, which would reignite the optimism and scientific accomplishments of the 1960s Apollo Program. The Space Policy Directive 1 that the President signed at the White House on December 11 pledges that "America will lead in space again." The new space policy commits the United States to return to the Moon, overturning eight years of the Obama Administration's sabotage of that critical next step in space exploration.

NASA/Aubrey Gemignani

President Trump signing Space Policy Directive 1.

"The directive I am signing today will refocus America's space program on human exploration and discovery," said the President. "It marks an important step in returning American astronauts to the Moon for the first time since 1972, for long-term exploration and use. This time we will not only plant our flag and leave our footprint, we will establish a foundation for an eventual mission to Mars and perhaps, some day, to many worlds beyond."

At the ceremony, the President was flanked by two current astronauts, and three former astronauts, including Harrison (Jack) Schmitt. Schmitt was on the Apollo 17 mission 45 years ago, which was the last to land astronauts on the Moon. Recognizing the occasion of the anniversary, President Trump turned to Schmitt. "Exactly 45 years ago, almost to the minute, Jack became one of the last Americans to land on the Moon," said the President. "Today we pledge that he will not be the last, and I suspect that we will be finding other places to land in addition to the Moon."

NASA's leadership not-so-subtly made its preference clear, by bringing a piece of Moon rock to the White House ceremony, which had been collected by Harrison Schmitt during the Apollo 17 mission, "as a reminder of exploration history."

"This directive will ensure America's space program once again leads and inspires all of humanity," the President said. We will "lift our eyes all the way up to the heavens."

"Imagine the possibility waiting in those big beautiful stars if we dare to dream big. That's what our country is doing again, we're dreaming big."

The goal of the nation's space program, to move human civilization beyond Earth to the Moon, was to be the next step after Apollo. The outline of that mission was based on the decades of planning by a group of German space pioneers who came to the United States with the specific goal of mankind's exploration and development of the Moon. One of these, the visionary Krafft Ehricke, who determined that space exploration is not an option, but an "extraterrestrial imperative," had, by 1970, created a detailed road map for the scientific and industrial development of the Moon.

Lyndon LaRouche brought the necessity of a "crash program" for space exploration into the national spotlight in January 1987, during his presidential campaign, with his nationally televised broadcast titled, "The

Woman on Mars." LaRouche envisioned a colony on Mars to be operational within 40 years, built on the foundation of the previous decades' industrial development of the Moon. He describes not only the technological breakthroughs that would make Moon and Mars colonization possible, but the cultural paradigm shift that would bring Americans, and particularly our youth, back to a science-centered world view, and an optimism about the future.

Now decades later, after previous false starts, there is the opportunity to revive the "spirit of Apollo." But to bring the lunar return that President Trump supports to reality, along with his other objectives, such as his multi-trillion-dollar infrastructure plan, will require a complete reconceptualization of the economy and economic policy. Lyndon LaRouche's Four Laws provide us with the conceptual framework. An economy vectored toward a credit system that energizes investment in science, technology, revolutionary advances in industry, and the general welfare of the population, will lay the basis for the President's vision.

President Kennedy's Apollo program succeeded because he took personal responsibility to organize political support for it as a national mission, and because his FDR-inspired economic priorities included upgrades in education and healthcare, an investment tax credit to encourage industry to expand and modernize, federal investments in infrastructure, and an R&D tax credit, to create new technologies to up-shift the productivity of the economy as a whole.

Twice since President Kennedy's Apollo program, there have been announcements of Moon/Mars missions for NASA. But neither that of President George H.W. Bush nor George W. Bush came to fruition. President Trump has the opportunity now to put the U.S. on the path to realize what space visionaries have long prepared: to make mankind a space-faring species.

Industrial Development of the Moon

Living on the Moon, and creating an industrial economy and science hub there, will require what development projects on Earth require—infrastructure.

Krafft Ehricke's concept of a lunar program was that the economy of the Moon, seen as our planet's seventh continent, should be integrated with that of the Earth. This would create an "open world" for Earth, burying once and for all the fallacy that there are "limits to growth." The mineral and metals resources of the Moon, the manufactured products produced from them, and the cache of unique resources such as helium-3,

courtesy of Krafft Ehricke

Krafft Ehricke (1917-1984)

would supplement those on Earth. Fission, and later, fusion energy would provide the large-scale power sources for lunar industry and the city on the Moon. Astronomical observatories, particularly on the far side of the Moon, undisturbed by electromagnetic noise from Earth, would open a new window to the Universe. A new civilization would be created of citizens who call the Moon, not the Earth, "home."

To get from here to there, the first step is for a robust infrastructure in Earth orbit, as Ehricke proposed. Unmanned spacecraft for all of the applications we have today would be upgraded, including telecommunications, Earth remote sensing, and weather forecasting, as well as arrays of scientific satellites for Earth and space studies.

A "space station," with functions greatly expanded from those of today's International Space Station, would be a city in space, which Ehricke descriptively called "Astropolis." Specialists would check out and then launch spacecraft to Mars, and activities that benefit from microgravity, such as medical treatment, would be offered in the city. Visitors would share the experience previously only available to astronauts, of seeing the Earth from space as the home of mankind.

A fleet of nuclear-powered cargo vehicles, which Ehricke called the Diana fleet, would shuttle between Earth orbit and lunar orbit. The cargo vehicles would deliver supplies from Earth to the Moon to build and supply industry and the lunar city, and would return to Earth orbit with raw materials and, increasingly, with manufactured products from the Moon.

The colonists on the Moon would not live in "habitats," or a lunar "base," but in Selenopolis, a city with thousands of residents. With time, Selenopolis would

Chris Sloan

Selenopolis, as envisioned by Krafft Ehricke, is not a habitat or lunar "base," but a city on the Moon.

become economically self-sufficient and create the platform from which to continue on to Mars.

While Krafft Ehricke's magnificent multi-decade plan for the settlement and industrialization of the Moon is not yet on the table, President Trump's new space policy creates the possibility to take the steps necessary to fulfill it, since the President has directed that America's return of humans to the Moon will be for "long-term exploration and utilization."

The Return to the Moon

NASA has been anticipating that the new leadership in the White House would reverse the lunar ban of the Obama Administration. A small lunar technology development effort had continued, and the leadership of the space agency has stated that development of the lunar-landing Altair spacecraft that was halted under the Obama Administration, could be quickly restarted.

In order to prepare for what was hoped would be the Trump Administration's return to the Moon, NASA has designed a Deep Space Gateway, a small-scale lunar orbital facility to be manned periodically, with no landings included. This bare-bones, almost half-hearted design, pales in comparison to the accomplishments of the Apollo program and to President Trump's directive.

But even this minimal concept has generated support from Russia, Japan, and Europe, who are no doubt relieved that sanity has returned to the U.S. space program.

The head of the European Space Agency (ESA), Jan Woerner, has put forward the idea of a Moon Village. This is a general concept he makes clear, which envisions a multitude of separate components and facilities on the Moon, contributed by governments, private companies, and any other parties with the capability.

Among the current programs for unmanned, robotic exploration, South Korea is developing the technology for a Pathfinder lunar orbiter mission, and later lunar lander. India is preparing its Chandrayaan-2 lunar mission for launch, to include an orbiter, lander, and rover, to follow its highly successful first orbital Moon mission. Japan also plans a follow-on to its Selene orbital mission, to also include a lander and rover.

China is pursuing a long-term, methodical lunar exploration program, which will undoubtedly culminate in a manned presence on the Moon. Each mission is extending China's capabilities for exploration and for breaking new ground in science and engineering. Long-term lunar exploration goals have frequently been stated, and include the mining of helium-3 from soil on the lunar surface as a fuel for fusion power plants. It is that ability, to plan decades ahead in order to fulfill a national mission, that distinguishes the Chinese program from the others now underway.

China's space exploration program is not a stand-alone project, but a centerpiece of its goal of creating a "knowledge-based society" that drives economic growth and creates the scientific talent to make the breakthroughs of the future.

The United States must quickly get started on a space exploration program that will "inspire all of humanity," as the President directed.

To succeed, it will have to be a national mission. It is foolhardy to count on Internet billionaires or enthusiastic college students to carry out a space exploration program for the nation. It is decades past time to return to a credit-based economic policy for investments in long-term projects, most emphatically the space program, which are the legacy, as well as the future, of this nation.