

August 27, 2012

# The Space Impact of the Euro Crisis

◀ ROBBIN LAIRD and HARALD MALMGREN ▶

The European sovereign debt crisis is not simply a bump in historical progress; it is the end of a period of history and a critical point in European and global transition in the 21st century.

The confluence of several trend lines — the unification of Germany, the end of the Soviet Union, the collapse of the Berlin Wall, the expansion of NATO, the expansion of the European Union (EU) and the creation of the single currency — constitutes a unique period in modern European history.

The trend line was also defined by moving the borders of Europe eastward with the expectation that an expanded Europe would manage its own internal dynamics well and provide stability in a historically unstable region of the world.

However, the European crisis is also gradually revealing serious flaws in the functionality of both the European Union and NATO. The two decades of European consolidation and expansion are now confronted with new centrifugal forces that are again widening political, social, economic and security differences within the EU and among its neighbors. Deepening recession and the severity of its impact on employment and the well-being of citizens are increasing these differences and encouraging re-energized nationalism and renewed political localization.

Europe will now be challenged in the form of rollbacks of the many intertwined strands of integration, fraying what has been an intricate but incomplete tapestry. It is questionable whether Europe will be able to prevent stalling of the integration process in the face of widening gaps among the interests of each nation and even within each nation.

Since the birth of the euro, the French and Germans were in the lead in

ing to hide the reality of European bank weaknesses. The main reason is that eurozone economies are far more bank-dependent than economies like those in the United States or United Kingdom, where substantial nonbank financing alternatives exist for the corporate sector.

In the eurozone, banks are the financial markets; in the U.S., banks are but one segment of a multifaceted financial market. Eurozone govern-

of the savings of millions of European citizens.

European leaders are also attempting to initiate a more comprehensive fiscal union, with new decision-making mechanisms that transfer sovereignty in parallel with the new banking union. We do not believe that any of the eurozone governments are ready for such a political transition in which citizens in each nation must agree to be under leadership of people appointed or elected in some other nation among the European Union members.

The way ahead in dealing with the crisis will have a significant impact on the space business in Europe and beyond. A key element will be reshaping the euro around the German policy agenda. The Germans will be key players in reshaping the euro and downsizing the eurozone to what might be called the Ger-Euro. The economic and political weight of Germany will go up as the euro crisis goes on, and the weight of German influence will be to reshape the eurozone into a more cohesive, "responsible" and integrated "core."

But this is a united Germany, which is shaping a European-cohesive process, not a divided Germany, which had to accept the dictates of smaller European powers to gain an end of national division.

The weight of Germany in shaping

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resisting transfer of national regulatory power to the European Central Bank or some other eurozone-wide entity. Other euro governments have also insisted on keeping local supervision of banks. What really lies behind this continuing resistance is that national governments and their banks do not wish to reveal the true leverage and the weakness of capital among European banks.

Eurozone governments are still try-

ing to risk collapse of their national economies through full revelation of the weaknesses of their banks. Thus, this is not solely an issue of whether or not to yield national sovereignty. A true banking union based on transparency would necessitate a redefinition of all European banking against a backdrop of hundreds, even thousands of bank failures and decimation

## 50 Years after Mariner 2: Exploration at a Crossroads

◀ ROGER D. LAUNIUS ▶

Solar system exploration is approaching a major turning point just as it is surpassing a major milestone. Fifty years ago, on Aug. 27, 1962, NASA launched the first successful planetary probe, Mariner 2, which visited Venus later in that same year. Regarded as both the evening and the morning star, Venus had long enchanted humans, and all the more so since astronomers had realized that it was shrouded in a mysterious cloak of clouds permanently hiding the surface from view. Mariner 2 was a triumph in helping to reveal the closest planet to ours, and a near twin in terms of size, mass and gravitation, to the billions on Earth.

Although Mariner 1 was lost during a launch failure, its twin, Mariner 2, flew by Venus on Dec. 14, 1962, at a distance of 34,800 kilometers. A 204-kilogram spacecraft, it carried six scientific instruments, a two-way radio, a solar-power system and assorted electronic and mechanical devices. Mariner 2 probed the clouds, estimated planetary temperatures and pressures, measured the

charged particle environment and looked for a magnetic field similar to Earth's magnetosphere (but found none). Most important, it found that the planet's surface was a fairly uniform 460 degrees Celsius, thereby making unlikely the theory that life existed on Venus.

There had been longstand-

Earth's turn, this pop culture belief suggested that Mars had once been habitable and that life on Venus was now just beginning to evolve. Beneath the clouds of the planet, the concept offered, was a warm, watery world and the possibility of aquatic and amphibious life. "Mariner: Mission to Venus," a 1963 NASA publication about

the same steamy atmosphere could be a possibility."

Mariner 2 helped to determine that none of these speculations was true. The second in a series of planetary exploration spacecraft, this was the world's first fly-by of a planet. Part of a 1961 NASA planetary exploration initiative that took some of its design from the Ranger

spacecraft on Jan. 2, 1963, and it is now in orbit around the sun.

This important milestone in planetary exploration signaled by Mariner 2's mission to Venus is an appropriate cause for celebration. It is also an ideal time to reflect and take stock of U.S. efforts to understand our solar system because the planetary exploration program is stalling through a lack of resources and technology necessary to advance it. Unfortunately, after years of success in planetary exploration, NASA's efforts are beginning to wane. Since the 1990s NASA has sent an armada of spacecraft to the red planet, of which the Curiosity rover is the most recent, and two outer planetary missions — Galileo and Cassini-Huygens — have opened the jovian planets to study. The New Horizons space probe to Pluto and the Kuiper Belt at the outer reaches of this system promises to do the same in the coming years. Not to be outdone, Messenger has expanded knowledge of Venus and the inner solar system. A range of smaller and less-com-

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ing speculation that life might be present on Venus. In the first half of the 20th century, a popular conception held that the sun had gradually been cooling for millennia and that as it did so, the terrestrial planets of the solar system had a turn as a haven for life of various types. Although it was now

the Mariner 2 mission, noted, "It was reasoned that if the oceans of Venus still exist, then the Venusian clouds may be composed of water droplets; if Venus were covered by water, it was suggested that it might be inhabited by Venusian equivalents of Earth's Cambrian period of 500 million years ago, and

program, Mariner 2 bore a striking resemblance to the basic framework, solar panels and antennas of its Ranger predecessor. Its controllers, numbering roughly 75, worked from NASA's Jet Propulsion Laboratory in Pasadena, Calif. Although Mariner 2 did its job well, NASA lost contact with the

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European space policy and business approaches will clearly go up. And the role of Germany already in the launch side of the business within Europe was on the ascendancy prior to the highly visible euro crisis.

Also likely is an acceleration of global partnerships and presence. We have seen Airbus announce plans to come to the United States; will space businesses follow into the non-eurozone? Will Europe recast its business face toward a more significant industrial presence outside of Europe to shape a long-term response to the euro crisis?

It is also likely that partnerships with countries like India and Japan need to be deep-

ened to ensure that core European space capabilities are maintained and sustained.

In other words, one outcome to the euro crisis could be to propel Europe into a leading position in reshaping the global space business and strategic partnering. And such an outcome would have a significant impact on the United States, if the U.S. cannot shape a more effective global partnership and export system.

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plex spacecraft have also undertaken significant investigations.

But we are at the point where not much in the way of planetary exploration is currently approved, under development and moving toward launch. The Mars Atmosphere and Volatile Evolution, or MAVEN, mission is set to launch in 2013, and it promises to capture important data about the red planet's upper atmosphere, ionosphere and interactions with the sun and solar wind. An outer planet flagship mission — probably either to Saturn's moon Titan or Jupiter's Europa — is also in the planning stage but will probably not be launched for many years, if at all. Some smaller missions — for example, the Osiris-Rex probe to take samples from an asteroid — are also under way. Indeed, of the major projects currently under study or in development by the NASA Science Mission Directorate, only five are planetary spacecraft (two of which are lunar probes), while one of these is the just announced InSight Mars lander as a part of the NASA Discovery program. Most of these projects are Earth science (15), astrophysics (eight) and heliophysics (seven) spacecraft.

Pure numbers of missions are not the key criteria for assessing the current state of the planetary program, of course, but the planetary science budget also took major hits in federal budget projections, down from \$1.5 billion in fiscal year 2012 to \$1.2 billion in 2013, with no indication of any increase coming in the next five years. While some outer planet missions remain on the books, only concept studies are approved. There has also been a modest investment in technology development to support planetary exploration, such as the development of the Advanced Stirling Radioisotope

Generator that is necessary for outer planetary missions and the restarting of the plutonium-238 production line.

Since the 1990s, America has participated in a golden age of scientific discovery about the solar system, made possible by coordinated efforts to create expansive, challenging and engaging programs — such as the "Follow the Water" agenda for Mars — that have benefited everyone from the millions of students jazzed by the latest images from the martian surface to elders who reflect on how we have advanced and altered our understanding of the cosmos in their lifetimes.

In the critically acclaimed television situation comedy "Sports Night," about a team that produced a nightly cable sports broadcast, one episode in 2001 included a powerful statement that relates directly to NASA's planetary science program. Actor Robert Guillaume announced on the show, "You put an X anyplace in the solar system, and the engineers at NASA can land a spacecraft on it." Through 50 years of planetary exploration that began with Mariner 2, NASA scientists and engineers have engaged in the stunning feats — Curiosity's landing is only the most recent — that Guillaume spoke about. While I hope I am wrong, I am concerned that there may not be many more "X marks the spot" planetary missions in the near future. Will efforts be expansive and engaging, as in the past, or limited and passé, as seems to be the direction we are presently heading. Since the results of decisions taken today may not be felt for several years, what are the prospects in planetary exploration into the 2020s and thereafter? Do we accept those decisions, and if not, what are we to do about it?

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