
III. Our Galactic Mission

Gateway to Our Galaxy: New Horizons Revisited

by Janet G. West

Author’s note: About three years ago, EIR reported on some of the initial findings of the New Horizons flyby of Pluto on July 14, 2015. This is intended to augment that discussion.

“Ah, but a man’s reach should exceed his grasp; Or what’s a Heaven for?”

—Robert Browning

July 29—The extraordinary New Horizons mission *would not have occurred*, were it not for the mindset—the perseverance, leadership and at times, sheer determination—of the scientists who organized the project, as well as the thousands of engineers, technicians, analysts and others who collaborated to ensure its success. That story is nearly as fascinating and dramatic as the mission to Pluto itself.¹

By the 1980s, these scientists realized that although there were NASA missions to the planets, there were none planned for the exploration of Pluto. Being planetary scientists who liked challenges, Pluto offered enticing mysteries for them—even without the advantages of what could be seen with the Hubble telescope later—and an informal grouping of “Pluto-philes” formed. The timing of Pluto’s orbit lent some urgency to the effort, since it was on a trajectory of its closest approach to the Sun; a mission would have to be launched in time to take advantage of this.

1. Stern, Alan and Grinspoon, David. *Chasing New Horizons: Inside the Epic First Mission to Pluto*. Picador. 2018.



The New Horizons (NH) spacecraft was launched on January 19, 2006, with the fastest launch speed of any spacecraft, reaching the orbit of the Moon in just nine hours. It is the first and only mission planned to explore Pluto and the Kuiper Belt. Travelling with an average speed of 32,000 mph, it didn’t arrive near Pluto for its now-famous flyby until nearly 10 years after its launch, at which time it delivered stunning pictures of Pluto and its moons. Its mission has been extended by NASA, so it will continue to explore new celestial bodies; during the upcoming New Year’s Day 2019, it will be flying by the Kuiper Belt Object 2014 MU69 (recently unofficially renamed “Ultima Thule”²), which is another *one billion miles* beyond Pluto.

2. “Thule” was the name given by ancient Greeks of a mythical place or island that was the furthest north; *Ultima Thule* would mean “beyond the frontiers of the known world.”

A Galactic Orientation

Before looking at the New Horizons mission more closely, we first need to change our perspective of the ordering principle of our science: the “norm” has been to start from the small (our Earth), and gradually to the large (the Moon, the Sun, the planets, etc.) However, if you step out under a clear night sky, away from city lights, what is the largest structure you see? The Milky Way!—stretching from horizon to horizon. It is our galaxy, which—as we’re beginning to discover increasingly—determines some of our weather and other activity, as our solar system moves in its orbit.

Astronomy was mankind’s first science. Prehistoric man navigated the trackless oceans by understanding the diurnal, seasonal and longer cyclical changes in the paths of the heavenly bodies above. The points and circles we now draw on our globes—the equator, the tropics, and the poles, for example—were first drawn on the celestial sphere, before being copied down onto Earth’s surface much later. The Greeks knew the locations of the poles, and the climate of the Arctic and Antarctic, without ever having been to either pole—we didn’t get there until the Twentieth Century. Indeed, the word “climate” is just the Greek word for the inclination of the Sun’s rays.

In our mind’s eye, from the celestial sphere we move to the larger scale of the galaxy. On its journey of 230 million years in orbit within the Milky Way, our solar system is affected by diverse galactic environments, such as when it moves “north” and “south” of the galactic plane, as well as other influences. Right now, our solar system is moving through a Local Interstellar Cloud which may have unpredictable effects on our weather.³ There is a correlation between Ice Ages on Earth, and the passage of our solar system through the Milky Way’s spiral arms. Also, all the planets are affected by the solar wind; scientists are still uncovering how it and cosmic radiation impact and interact with the solar system; how they drive weather; how geological events like volcanoes are affected, and so forth.

Keplerian Principles: Towards a New Astronomy

To examine and challenge one’s own axioms and assumptions is one of the hallmarks of true science; a true scientist is happy to have erroneous hypotheses over-

3. https://science.nasa.gov/science-news/science-at-nasa/2009/23dec_voyager.

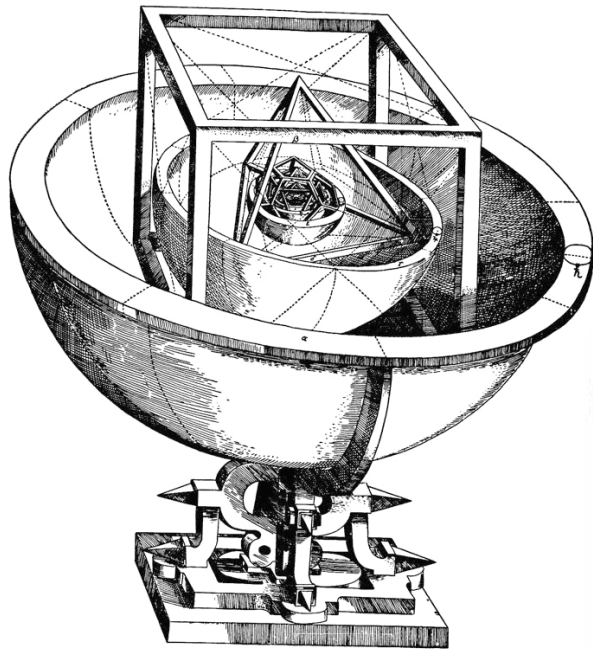
turned. Scientists are constantly developing hypotheses and then overthrowing them with newer, less imperfect hypotheses about the nature of the Universe. In the words of one delighted scientist, “[What we’ve found on Pluto]... has inspired me! It showed me just how wrong I could be!” It is often through an apparent “dissonance” or “anomaly,” that true science makes progress.

The Universe is usually described in such a way that assumes the validity of the Second Law of Thermodynamics, but this view doesn’t align with the development of Earth’s biosphere or explain the existence of man. Lyndon H. LaRouche, in his 1988 autobiography *The Power of Reason* talks about his development of a science of physical economy based on man’s creative capabilities and the tendency of the Universe to be anti-entropic (a method which produces his accurate economic forecasting). LaRouche said in that book, “A universe based on principles of winding down, could not have come into existence in the first place.”

The standard description for the formation of our solar system starts with a broad rotating disk of lumpy matter, and larger clumps would attract smaller clumps, and increase in size solely due to rocks banging into each other. This friction would heat up the rocky clumps. They would get larger and larger until gravity took over and they began clearing out the area around them. Under this model, the asteroid belt and Kuiper Belt are considered to be the “leftovers” from this process. We need a new astronomy to meet the challenges of expanded space exploration. It takes more than geometry and calculations to think about the solar system and the galaxy. One must use one’s mind eye to take a step out into space at a point at infinity; this is what early astronomers had to do to understand the motion of the heavens—it goes beyond the senses. Just as the introduction of the point at infinity on the horizon revolutionized the world of art, so too can a “long perspective” of the solar system and our galaxy reshape astronomy.⁴

Most science books will tell you who discovered what and when, but they rarely tell you the method by which the discovery was made, but it’s the method which is most important. As Louis Pasteur once observed, “Chance favors only the prepared mind.”

4. Perspective was first developed rigorously by Filippo Brunelleschi (1377-1446) and Leon Battista Alberti (1404-72) as part of the Golden Renaissance; increasing the powers of artists, architects and engineers, as well as the intellectual powers of the average person.



Kepler's first approximation of the planetary orbits.



the note of F#, a dissonance within the C major scale⁵ so great that no planet could form.

Through some of his thoughts, you may understand better that Kepler wasn't a "cold, calculating mathematician":

We do not ask for what useful purpose the birds sing, for song is their pleasure since they were created for singing. Similarly, we ought not to ask why the human mind troubles to fathom the secrets of the heavens...The diversity of the phenomena of Nature is so great, and the treasures hidden in the heavens so rich, precisely in order the human mind shall never be lacking in fresh nourishment.⁶

Johannes Kepler was still a university student when he obtained Copernicus' book which revived Aristarchus' understanding that the planets orbit the Sun. Kepler recognized that Copernicus' work left the important problems still unanswered, and hypothesized that the planetary orbits were determined by concentric spheres circumscribed around, and inscribed within, the five nested Platonic solids. This was not a "model," as contemporary neo-Babylonian thinking would insist, but rather an hypothesis—later proven by Karl Gauss with the case of the asteroid Ceres—concerning the *cause* for the given orbits. From the ancient Pythagoreans, to Plato's *Timaeus*, Kepler, Gauss, Riemann, Planck and Einstein, scientific thought worthy of that name has always known that space-time is not a mere empty container, but rather has a structure.

The ancient Greeks understood that the fact itself that only these five regular solids can be constructed, is a feature of the structure of space—and the planetary orbits are determined by the structure of space. Kepler's later, refined hypothesis included the harmonic relationships among the orbits of the planets. He discovered that the relationships between the perihelion and aphelion of the orbits of adjacent planets could be translated into musical notes. For example, the asteroid belt between Mars and Jupiter represents

In the case of calculating Mars' orbit, Kepler didn't just rely on his senses, which told him that Mars made a loop (retrograde motion) in its transit in the sky; Kepler's method included exhaustive calculations of Earth's and Mars' orbits, but he also did something remarkable: in his mind's eye, he "viewed" the orbits from the point of view of the Sun, and then from Mars, looking back at Earth's orbit, in order to fully understand not just the calculations, but the *relationships* between the Sun and the planets. Kepler also challenged future scientists to improve upon his system. Kepler saw no dichotomy between geometry and music; astronomy and God:

The heavenly bodies are nothing but a continuous song for several voices (perceived by the intellect, not by the ear); a music which...sets landmarks in the immeasurable flow of time. It is therefore, no longer surprising that man, in imi-

5. *Manual on the Rudiments of Tuning and Registration, Book I.* The Schiller Institute, 1992.

6. *Mysterium Cosmographicum.*

tation of his creator, has at last discovered the art of figured song, which was unknown to the ancients. Man wanted to reproduce the continuity of cosmic time...to obtain a sample test of the delight of the Divine Creator in His works, and to partake of his joy by making music in the imitation of God.

In the same tradition, in an article addressing the insidious effect of philosophical reductionism (empiricism) on physical science, Lyndon LaRouche observed:

Currently, our best knowledge is that the Solar System began as a fast-spinning, youthfully exuberant solitary Sun in the universe at large. According to Kepler's principles, this young Sun spun off some part of its material into a disk orbiting the Sun itself. If we assume polarized nuclear fusion occurring within that disk, then it were possible for polarized fusion, and, presumably, only polarized fusion, to have generated the observed periodic table of the Solar System. That fusion-generated material from the disk would have been "fractionally distilled" into approximately the Platonic orbits defined by Kepler. Then, according to Gauss's reading of the matter, the elliptical-harmonic characteristics of the orbit would have "condensed" the material distributed along each orbit into relevant planets and their moons. The crucial view of this hypothesis was provided by Gauss's proof of Kepler's case for the self-fractured missing planet, the debris known as the Asteroid belt.

Such Kepler-Gauss-et al. conclusions are in accord with the primary characteristics of what I have summarily described as Vernadsky's systemic biogeochemical view of the universe. In other words, the argument is, that the universe is created as an intrinsically self-developing universe, in a process of development expressed, inclusively, by built-in generation of more highly differentiated states of self-organization. Additionally, that the anti-entropic principle of cognition (*noësis*) already existed in that universe "from the beginning," but could be expressed as man only under the emergence of certain new, lawfully generated states of local organization of the universe as part of the uni-

verse's overall, anti-entropic self-development. Since the anti-entropic principles of life and *noësis* are of a universal quality inhering in a multiply-connected universe, the universe was always anti-entropic as a whole. Man's manifest power to increase his willful control over the universe through nothing other than *noësis*, demonstrates this experimentally. Such is the work of epistemology; no ideas are legitimate, unless the necessity of their coming into being is demonstrated from an experimental standpoint.⁷

These *noetic* powers of the human mind, as identified by the great geobiochemist V.I. Vernadsky, and developed in-depth by LaRouche's writings on economics, philosophy and creativity, are that which distinguish human beings from the beasts, and increase man's powers over nature.

There have been other scientists who have also promoted this view of mankind, and their writings should be revived for future space missions. In the 1950s, the late famous scientist Krafft Ehrlicke promoted the idea of the "extraterrestrial imperative"—the necessity for man to explore space and develop its resources. Among other accomplishments, Ehrlicke worked on the first liquid-hydrogen-fueled rocket that would be the basis for the Saturn V rocket and was the chief scientist for the Space Systems Division of North American Aviation (later Rockwell International) in the 1960s and into the 1970s.

He outlined his Three Laws of Astronautics (1957):

- **First Law:** Nobody and nothing under the natural laws of this universe impose any limitations on man except man himself.
- **Second Law:** Not only the Earth, but the entire Solar System, and as much as the universe as he can reach under the laws of nature, are man's rightful field of activity.
- **Third Law:** By expanding through the universe, man fulfills his destiny as an element of life, endowed with the power of reason and the wisdom of the moral law within himself.

Krafft Ehrlicke made many profound contributions to the exploration of space and typifies the hopeful perspective that can guide a mission orientation for our solar system and beyond.

7. LaRouche, Jr., Lyndon H.; *Visualizing the Complex Domain*, EIR 2003.

The Problem with Science Today

It will be the task of a future work to address the enormous targeted assault on the American people in the wake of World War II, attacking nuclear energy and radiation through movies and popular culture. Of course, there are dangers associated with radiation (as well as benefits), but tales of giant ants, moths, and other monsters produced by atomic testing go beyond the pale.

However, the reality of Sputnik smacked Americans out of their stupor, awakening a renewed interest in science and increased respect for scientists and engineers. President John Kennedy's famous speech of 1962 rallied the nation to send astronauts to the moon and return them safely back to Earth:

We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win, and the others, too.⁸

This mission injected new energy into the scientific community and rallied the educational institutions to expedite the development of engineering and other scientific disciplines. The successful missions also created a blooming of optimism, in America and around the world.

When American astronauts first landed on the Moon, the entire world celebrated the accomplishment; an estimated 600 million people watched the landing via television, and more than a billion listened by radio. Soon after their return to Earth, they visited many nations as part of a worldwide Goodwill Tour, and they remarked that **no one** they met, no matter what country they were in, would say, "The Americans did it"; it was always "*WE* did it!" Neil Armstrong's famous quote, "One small step for a man, one giant leap for mankind," would be echoed by other Apollo astronauts: the consensus was, "We did this for all mankind." A great promising era opened up.

But, then came the Rock-Drug-Sex Counterculture/New Age Movement (organized and deployed by the British oligarchy), and for the most part, our population capitulated; even our best scientists have been

8. <https://er.jsc.nasa.gov/seh/ricetalk.htm>.

infected with the spores from this cultural slime-mold.

At the same time, the idea of "entropy is the law of the Universe," as promoted by Norbert Wiener, was heavily propagandized on all levels:

Sooner or later we shall die, and it is highly probable that the whole universe around us will die the heat death. We are immersed in a life in which the world as a whole obeys the second law of thermodynamics; confusion increases and order decreases. . . .⁹

Our problem is not so much the environmentalists and "zero-growthers"—our Achilles heel is the lack of scientific thinking among most Americans, and a certain kind of moral and intellectual cowardice. Anyone at least as smart as a caveman could surmise the agenda of "environmentalism": genocide against humanity. Why weren't the environmentalists run out of town on a rail, by most citizens, at the very start?¹⁰ Who benefits from duping much of the Western world to perform, in effect, a mass lobotomy?

And, don't be fooled into thinking that they care about "Mother Earth." There are many examples, but an egregious one is that *just one* "solar plant" kills up to 6,000 birds annually, since it's built *right in the path* of the Pacific Flyway—one of the major migratory pathways for birds.¹¹ Due to the power of the sun's concentrated rays, as the birds fly over the "plant," they are incinerated instantly, leaving little plumes of smoke wafting in the wind. And, wind turbines kill upwards of 328,000 birds and up to 900,000 bats annually. (Any farmer can tell you how important and useful bats are—some for pest control and some for pollination, depending on species.)

Why give any credence to some pagan who may worship the Winter Solstice, but couldn't begin to tell you what a solstice is? Just for fun, ask one of these dimwits some time to draw out the orbit of the Earth, and show you where, when and why the solstice occurs.

Many scientists, or nominal scientists, have capitulated to this mindset, giving lip-service to the second law of thermodynamics; to "climate change"¹² or what-

9. Norbert Wiener, *The Human Use of Human Beings*, USA 1950

10. Locals in Alberta, Canada rightly mocked and ridiculed a famous Hollywood actor when, while filming on location, he warned that the warm seasonal Chinook winds "were a sign of climate change"

11. The Ivanpah Solar Plant; <https://www.scientificamerican.com/article/solar-farms-threaten-birds/>

12. Wasn't it "global cooling" in the 1970s? Then, the "Ozone hole,"

ever is the current “crisis,” with a heteronomic “me, first” mentality for a perceived limited resource—funding. The unifying conception of a national mission—such as we saw under the Kennedy Space Program—is nowhere to be found.

The level of some of these “scientists” reminds one of the academy of “researchers” found in Jonathan Swift’s *Gulliver’s Travels*:

The first man I saw was of a meagre aspect, with sooty hands and face, his hair and beard long, ragged, and singed in several places. His clothes, shirt, and skin, were all of the same colour. He has been eight years upon a project for extracting sunbeams out of cucumbers, which were to be put in phials hermetically sealed, and let out to warm the air in raw inclement summers. . . .

I went into another chamber, but was ready to hasten back, being almost overcome with a horrible stink. My conductor pressed me forward, conjuring me in a whisper “to give no offence, which would be highly resented”; and therefore I durst not so much as stop my nose. The projector of this cell was the most ancient student of the academy; his face and beard were of a pale yellow; his hands and clothes daubed over with filth. When I was presented to him, he gave me a close embrace, a compliment I could well have excused. His employment, from his first coming into the academy, was an operation to reduce human excrement to its original food, by separating the several parts, removing the tincture which it receives from the gall, making the odour exhale, and scumming off the saliva.¹³ [*sic*]

It is time to leave the land of the Lilliputians behind, and think like human beings again.

A Sense of Perspective

For the purposes of making more knowable to the reader the magnitude of the New Horizons mission, we’ll describe some of the relationships within our solar system.

Pluto is smaller than our Moon and possesses about the same surface area as Russia. It is on average 3.6 billion miles from the Earth, and its orbit is highly elliptical

then “global warming”? Now, they just go for the catch-all, “climate change.”

13. *Gulliver’s Travels*; first published in Ireland, 1726.



Blink comparator.

(2.6 billion miles from the Sun at the perihelion and about 4.6 billion at the aphelion), as well as cutting at an oblique plane relative to the plane of the other planets’ orbits. Its moons are Charon, Styx, Nix, Kerberos and Hydra. Although there’s been some controversy as to whether or not it’s a planet, a new definition has been developed to include Pluto as a dwarf planet, and possibly even a “binary planet,” due to its interaction with its closest moon, Charon.

Pluto was discovered in 1939, by Clyde Tombaugh, a farmer who was a self-taught astronomer; he had built telescopes on his farm, and after some entreaties to the Lowell Observatory in Arizona, was offered an opportunity to work there.

There had been a search for a “Planet X” for many years, due to observed perturbations of Neptune’s orbit, and he took up the search. Tirelessly, night after night for nearly a year, he took pictures of a particular spot in the night sky (where “Planet X” was thought to be), using an instrument called a blink comparator. By his perseverance, he noted a faint object moving against the background of stars—he had discovered Pluto!¹⁴ The method he developed for scanning the star field is still used today by astronomers. It is altogether fitting that some of his ashes fly onboard New Horizons, in honor of his discovery of the ninth planet.

We’re all familiar with the classroom-type poster of the solar system, and the planets neatly lined up to show their “relative sizes.” But, it were better to take a galactic

14. John Keats’ sonnet, “*On First Looking into Chapman’s Homer*,” expresses this wonder of discovery beautifully; this very well could have been how Tombaugh felt for some minutes after the discovery, when he was the only person on Earth to know that ‘Planet X’ had been found.

step back in order to review the relative sizes and distances of the planets in our solar system. Imagine the sun to be the size of a soccer ball, sitting on the goal line of a football field. Earth would be around the 26-yard line, and about a quarter inch in diameter. Going past Mars and the asteroid belt, we find Jupiter, 135 yards away from the “sun,” and about the size of a grape; going onwards to Neptune (pea-sized) we arrive at it nearly eight football fields away from the soccer-sun (or about 2,880 feet—slightly over one-half mile). We would have to travel another *17 miles beyond Neptune*, to reach pea-sized Pluto.

Now, going back up to its true, real-life scale, imagine the entire solar system in motion, and having the task to engineer a spacecraft about the size of a grand piano that had to be launched within a narrow time window, fly into the correct trajectory around Jupiter to get a gravity-assist, travelling at 32,000 mph, and successfully take scientific measurements in a flyby of Pluto lasting only a matter of hours, with a 9-hour round-trip communication link, all within NASA’s parameters and budget, using new technologies in a first-ever (and “one shot”) attempt to reach the outer reaches of our solar system. And, it had to get there within a 9 minute window on either side! Now, you have some perspective as to the true magnitude of this project.

‘Why Not Us? Why Not Now?’

It’s beyond the scope of this article to detail the fourteen-year-long struggle to organize, fund and launch the Pluto mission, but since it is vital to understand, a brief history is included. The leading scientists have been Alan Stern, Fran Bagenal, Ralph McNutt, Marc Buie, and William McKinnon. There are many more who lent their efforts to the mission, too numerous to mention here, but their dedication to the mission is recognized.

Had we a different culture and economics in this country—the economics of life, as developed by physical economist Lyndon H. LaRouche, Jr.—and the optimistic culture of our past (that of the landing on the Moon) and our hopeful future (the Spirit of the New Silk Road)—it were possible that there would have been no need for such a struggle for funding. There need be none in the future, given a revival of American System economics.

The scientists who have addressed various public forums and colloquiums have emphasized that the mission “takes a team”; but not only in terms of personnel. The mission depended heavily on numerous agencies,

and most importantly, the Hubble telescope and the Deep Space Network.

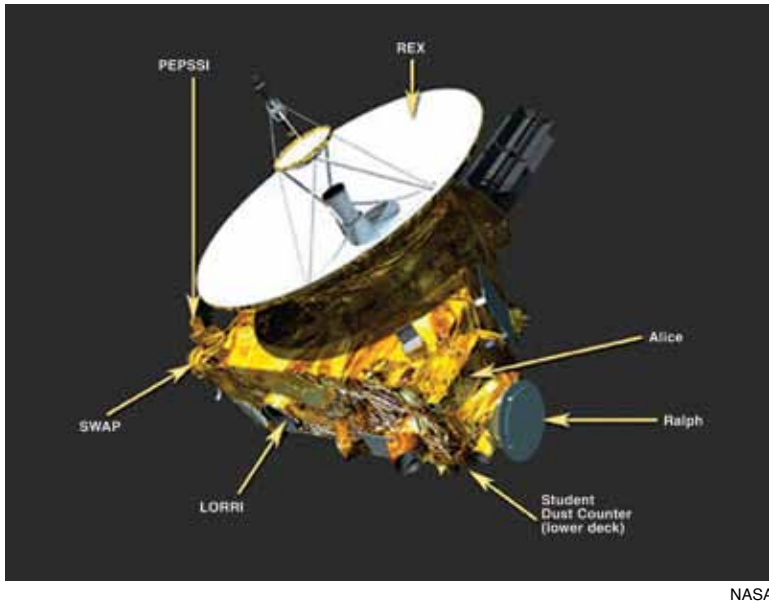
Before 1990, a mission to Pluto wasn’t even a gleam in NASA’s eye. The idea first came into being in 1989, when Alan Stern and some fellow “Plutophiles” gathered after a conference of the American Geophysical Union (AGU) in Baltimore, MD at a local restaurant. There, Stern had the audacity to propose, “We need a mission to Pluto!” He understood that part of the urgency lay in the timing of the orbit of Pluto, and various other alignments of the planets, such as Jupiter, so that the spacecraft could take advantage of a “gravity assist” from Jupiter. He began to organize the scientific community.

There were six different versions of the Pluto mission from 1989 to 2001 (NH is the sixth and final version). With each version, the team was asked to meet a new parameter: bigger, smaller, more instruments; budgets were cut, goalposts moved; redundant analysis of each instrument; etc. Each time, the team rose to the occasion and overcame the challenges, much as a great general will outflank the enemy, again and again, to reach the objective.

In 1995, the team had to contend with budget considerations, and they searched for ways to reduce the costs of a launch as much as possible. The team needed to design a craft with the smallest mass possible. The mission also required a very powerful rocket. Understanding that relations between the U.S. and Russia were beginning to thaw, Stern saw an opportunity. In a gutsy move, he decided—on his own—to travel to Russia to meet with Alec Galeev, head of the Space Research Institute in Moscow, to explore the possibility of Russian assistance with a launch, holding out the carrot that Russia could include a probe, so that Russia could claim that it was the first nation to touch Pluto. But, in 1996, for various reasons the Russians decided against providing a no-cost launch. (And, no wonder—everybody knows “there ain’t no such thing as a free launch.”)

Finally, the last straw came when—after an intense period of preparation, testing, and competition with the Jet Propulsion Laboratory (JPL) for the Pluto mission contract—the incoming 2001 Bush administration zeroed-out the budget. Stamatios “Tom” Krimigis, the head of the Space Science Department at the Johns Hopkins University Applied Physics Laboratory, responded to the crisis with something like, “*It’s time to break some legs!*”¹⁵ He put in a call to Sen. Barbara Mi-

15. Stern and Grinspoon, note 1.



NASA

New Horizons Spacecraft 3.

kulski, then chair of the Senate Appropriations Committee. She virtually ordered NASA to fund the Pluto project, and the project moved forward. We need more such scientists willing to put pressure on Congress for the right reasons.

The mission got underway, and Alan Stern, chosen to be the Principal Investigator, had the honor of naming the mission. As he relates in his book, he wanted something inspiring and hopeful, and being inspired himself while on a run in Colorado, as he set his eyes upon the enchanting horizon outlining the Rocky Mountains, he struck upon, “New Horizons.”

‘Though She Be but Little, She is Fierce!’

The NH spacecraft is about the size and shape of a grand piano, and she is packed with scientific instruments:

Ralph: Visible and infrared imager/spectrometer; provides color, composition and thermal maps.

Alice: Ultraviolet imaging spectrometer; analyzes composition and structure of Pluto’s atmosphere and looks for atmospheres around Charon and Kuiper Belt Objects (KBOs).¹⁶

REX: (Radio Science Experiment) Measures atmospheric composition and temperature; passive radiometer.

LORRI: (Long Range Reconnaissance Imager) Telescopic camera; obtains encounter data at long dis-

tances, maps Pluto’s far side and provides high resolution geologic data.

SWAP: (Solar Wind Around Pluto) Solar wind and plasma spectrometer; measures atmospheric “escape rate” and observes Pluto’s interaction with solar wind.

PEPSSI: (Pluto Energetic Particle Spectrometer Science Investigation) Energetic particle spectrometer; measures the composition and density of plasma (ions) escaping from Pluto’s atmosphere.

SDC: (Student Dust Counter) Built and operated by students; measures the space dust peppering New Horizons during its voyage across the solar system.¹⁷

The spacecraft is powered by—what else?—*plutonium!* “Electrical power for the New Horizons mission . . . is furnished by a single radioisotope thermoelectric generator (RTG), which transforms the heat from the natural radioactive decay of plutonium dioxide fuel into electricity.”¹⁸

It began with 240 watts of power at launch; if all the instruments were to be turned on at once (which Mission Control wouldn’t do), they would use *30 watts!* (Think of what we could do with fusion-powered rockets!)

‘Like Nothing Else in the Solar System’

After the flyby, the first pictures were breathtaking; but the real test would be whether NH relayed the signal that it had survived the flyby intact. It would be 14 hours before the team would know. Then came Mission Operations Manager Alice Bowman’s calm confirmation: “We are in lock with telemetry with the spacecraft. . . . We’ve received data at the Pluto system, and we’re outbound from Pluto.” The full data set would take 15 months to be transmitted.¹⁹

Due to the embedded assumption that entropy is the law of the universe, the prevailing view has been that small planets should cool off faster than the big planets. It was fully expected that Pluto was a cold, dead planet.

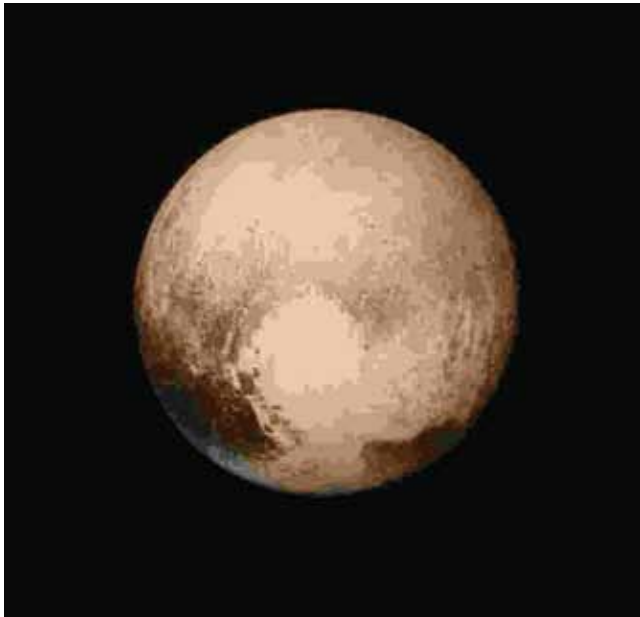
Initial hypotheses about Pluto indicated that it was too small and cold to have an atmosphere; and even if it did have an atmosphere, the computer models predicted it to be unsubstantial. Computer models are notoriously

17. www.nasa.gov/mission_pages/newhorizons/spacecraft/index.html.

18. <https://rps.nasa.gov/missions/7/new-horizons/>.

19. Stern and Grinspoon, note 1.

16. Ralph and Alice are named after “The Honeymooners” television series of the 1950’s.



NASA

First close-up picture of Pluto.



NASA

Colorized photo of Pluto.

wrong, because the axioms of entropy are built into the calculations. No computer can account for the non-linear effects expressed by even non-living processes.

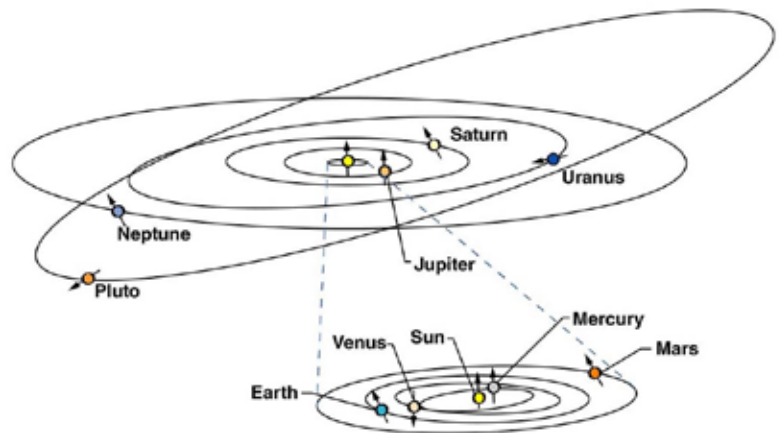
Atmosphere on Pluto was first detected in 1988 by the Kuiper Airborne Observatory; the pictures from NH showed a complex atmosphere with *well-organized layers* and haze, up to 100 miles thick! Confirming the 1988 findings, after the flyby, NH rotated to photograph a dark Pluto backlit by the sun—a bright blue haze encircled the planet. The color is due to complex organic molecules, called *tholins*, which are reddish-brown when they drop to the surface, but scatter blue light when in the atmosphere. Tholins are thought to contain some of the chemical precursors of life. This also explains the reddish-brown coloration of the older portions of the planet’s surface. Scientists associated with the mission were thrilled, since this also indicates weather on Pluto.

Thanks to other missions, we’ve been able to study the weather on other planets, such as Jupiter, Saturn and Neptune; each one is a study in anomalies and unexplained phenomena. Although we know of the 11-year sunspot activity cycle on our Sun, and that it affects weather, it doesn’t explain the intense and dynamic weather so distant from the sun. What role might the solar wind play? What might UV and infrared light

reveal about these weather systems? Think of the solar system as an actual system—not just a conglomeration of planets like billiard balls—and the complicated interactions between orbit, tilt of the planet, solar activity, galactic cycles and other influences yet unknown, from a principle of anti-entropy; that is, a demonstrable tendency of the Universe towards increased order, increased energy throughput, as well as differentiation.

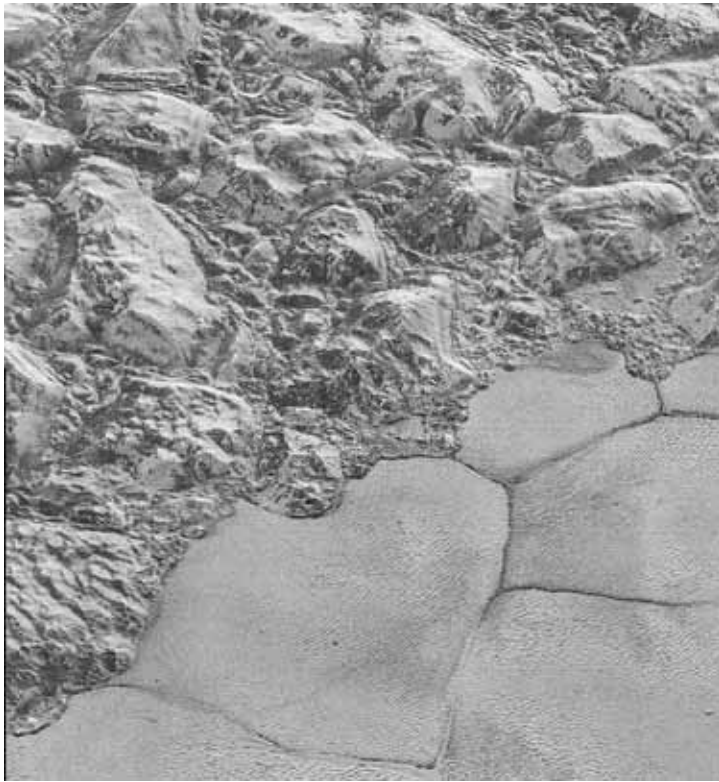
“Who would have expected a blue sky in the Kuiper Belt?” New Horizons principal investigator Alan Stern of the Southwest Research Institute (SwRI) in Boulder, Colorado, said in a statement. “It’s glorious.”²⁰

20. www.space.com/18564-pluto-atmosphere.html.



Orbits of the planets.

NASA



Dunes at the top, convection cells at bottom, on Pluto.

The weather and seasons on Pluto are complicated and will require research for years to come. Pluto's orbit takes 248 years for one circuit around the sun and is at an oblique angle to the rest of the solar system; one Pluto day is 6.4 Earth days; it has a retrograde rotation, and its axis varies between 102 and 126 degrees. And, like many planets, the axis experiences precession.

Add into this the complex nature of the binary rotation between Pluto and Charon, and it adds up to a very elaborate and dynamic weather system.²¹

The atmosphere of Pluto also has an intricate relationship with the solar wind; during portions of the year as different areas of Pluto are exposed to it, the atmosphere can vary in size and pressure. As the planet warms, the atmosphere rises and thickens; at other points, it "snows" onto the surface. How might this phenomenon affect geology?

In terms of surface features, what immediately gripped the attention of the scientists was the broad white heart-shaped feature (informally named "*Tombaugh Regio*," and the smaller "*Sputnik Planium*"). It's

21. They are mutually tidally locked; the same surface of each faces the other as they rotate around a common center.

astonishing to realize that there are *no craters* in this region; yet this planet is at least 4 billion years old, and cosmic objects have hit it continually, just as our Moon has been similarly bombarded! Scientists hypothesized that "something" was smoothing over the area—but what?

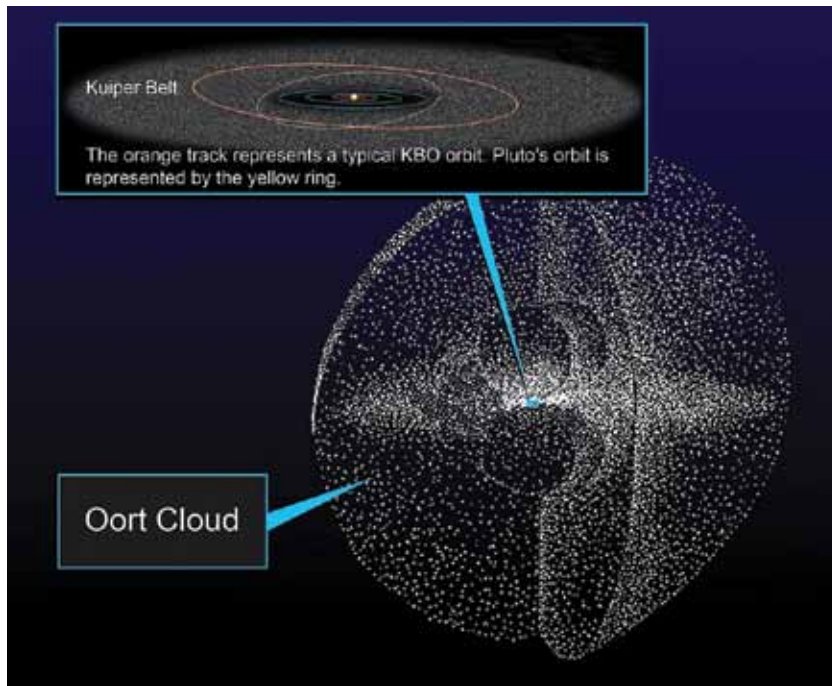
Looking closer, they found large hexagonal-shaped cells (about a mile across) that were determined to be convection cells. It is thought that the icy nitrogen surface is "boiling"—albeit slowly—and this churning is renewing the surface, smoothing over any craters. Scientists hypothesize that there's a subterranean ocean of liquid water; as the water rises, it freezes. The physics of freezing water is counter-intuitive: as water freezes, it releases latent heat energy to the surrounding environment. This is enough heat—just a few degrees—to cause the nitrogen to churn.

Another phenomenon—only seen on the *Sputnik Planium*—are hundreds of "pock marks" (that aren't impact craters), that seem to follow the flow of a huge glacier, but scientists are unsure how they are created. Now, the possibility of active geologic activity within this dwarf planet is being explored, since there's a huge variety of terrain. In reviewing the various geological features, Alan Stern joyfully exclaimed, "Everywhere we look, we find puzzles!"

There's a feature on the surface which appears to be a huge shield volcano. But—what could be powering it? Known as Wright Mons, it measures about 90 miles in diameter and about 2.5 miles high! Since it only has one large crater, scientists believe that there has been recent flow smoothing out other craters—but with a flow of what?

On another part of the hemisphere, there's an area of huge, blade-like ice mountains, oriented in a similar direction, ranging up to about 1,500 feet in height. Recent research indicates that they are made of methane ice that sublimates from the atmosphere and may have a base of water ice. It's still unknown why they have such sharp features, instead of being the expected nondescript blobs.

There are also discoveries on the largest of Pluto's moons, Charon. Its polar cap has a "stain," the reddish-brown indicating the presence of tholins. But Charon has no atmosphere. The current hypothesis is that at particular times during Pluto's orbit, some of the tholins in Pluto's atmosphere are transferred to Charon, but the mechanism is unknown.



NASA

Kuiper Belt and Oort Cloud.

The original specifications for the flyby had it set for 7,800 miles above the planet's surface; it arrived 83 seconds early, and 50 miles lower than planned—after a trip of 3 billion miles and 9.5 years! The flyby was covered on the front page of 458 newspapers, on all seven continents (yes, even Antarctica). New Horizons performed flawlessly.

One scientist in particular, Richard Binzel of MIT, summarized it enthusiastically, “Pluto isn’t ‘amazing’—Pluto is *ridiculously*, fantastically complex—even more than we imagined!”

The Kuiper Belt and Oort Cloud

Up until recently, the solar system was divided into two main regions: the inner “rocky” planets, and the four outer “gas giants,” divided by the asteroid belt.²² When it dawned on key administrators that Pluto and the Kuiper Belt represented a third, new zone of the solar system—this created excitement and renewed interest in the NH mission.

Predicted to exist in the 1950s by Gerard Kuiper, this is a belt which is billions of miles wide containing millions of comets, thousands of other icy objects and hundreds of dwarf planets. It is thought that this is the region from which many comets originate, and contains

22. Other stellar systems with similar distributions of planets and belts have been discovered; most notably those orbiting Vega and Fomalhaut.

the oldest objects in our solar system, going back to its inception. Study of this region, it is thought, may be able to begin to answer questions surrounding the origins of our solar system. The next object of study of NH, the Kuiper Belt Object 2014 MU69, has never been a comet, and as Alan Stern said with exuberance in a 2016 presentation, “[It will be] the most pristine relic of the solar system formation ever explored, and the flyby will be closer than Pluto. . . .”

Beyond the Kuiper belt, and still theoretical—is believed to be the Oort Cloud, named after the Dutch astronomer, Jan Oort, who hypothesized its existence in 1950; instead of another “belt” or “zone,” the Oort Cloud is thought to be a spherical reservoir of icy celestial bodies—the nuclei of long-range comets—representing the very edges of the reach of our sun’s gravitational field, and well beyond the heliosphere; the radius is estimated at 4.6 trillion miles beyond the Kuiper Belt.

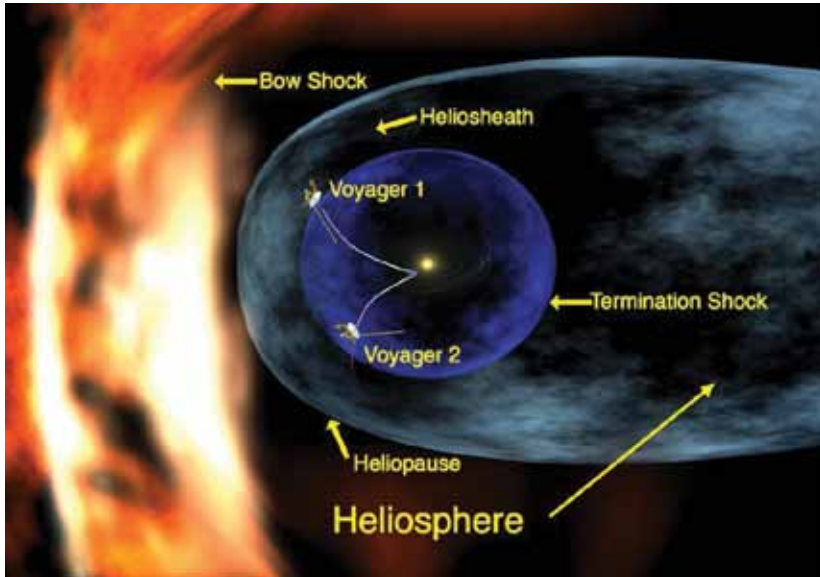
Voyager I (launched in 1977) is still operational and travelling at about a million miles per day; it will take over 1,200 years to reach the Oort Cloud (if it exists), and over 12,000 years to pass through it. The latest estimates as to the number of objects in the Oort Cloud are in the range of 2 trillion, but it could be higher.

What we do know is the general structure of the phenomenon at the far reaches of the heliosphere, thanks to Voyager I and Voyager II. At the very edges of the heliopause (where our system pushes against the interstellar wind), scientists are discovering a “frothy barrier” of huge magnetic “bubbles,” each of which is about 100 million miles across. A current hypothesis is that this “barrier” shields our solar system from much of the cosmic radiation in interstellar space.

Each time mankind moves our horizons forward, we encounter new anomalies and infinite mysteries to unfold. One glaring anomaly is, why did it take so long to secure funding and an operational go-ahead for such an obviously valuable scientific endeavor as the New Horizons mission? Part of the answer lies in the fact that our nation has been under attack for decades by the cultural pessimism of the Anglo-Dutch oligarchy—and their economics of death—as well as the genocidal ide-

Humanity First!

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NASA

Artist's conception of the Heliosphere.

ology of the environmentalist movement. Your beliefs about the nature of man are a *political* factor; if you think that man is merely an animal, then you are enslaved more surely than with chains.

The other irony is that the NH scientists were able to execute this mission with such precision, so perfectly, and able to capture stupendous pictures of Pluto, yet these same scientists listen to rock music and adore science fiction, both of which are antithetical to creative thinking.²³ Even they operate within a fixed sphere, and wouldn't be capable of organizing the American people for a cultural Renaissance.

The future of space exploration for the United States is largely in the hands of "we the people." What has been holding us back in large degree, has been *subjective*. Most of the rest of humanity is now moving into a New Paradigm, a paradigm of optimism, as represented by the Silk Road/Belt and Road Initiative of China, which has been led and organized by Helga Zepp-LaRouche and the LaRouche political organization over the past several decades. It is time for America to join with those nations, bringing the best of our true culture to revitalize not only our basic industries, agriculture and infrastructure, but to uplift and inspire the minds of our youth to abandon the death culture of drugs and entropic thinking, and to once again, "reach for the stars."

Given the outpouring of enthusiastic public support

23. The rock band Styx was invited to and toured the control center for the New Horizons mission.

for space exploration in general, and the New Horizons mission in particular, the American people have demonstrated that our deep cultural optimism can be revived with the appropriate leadership.²⁴ Were the present administration moved to openly support increased investment into space exploration, it would be welcomed by the American people.

America has led the way in space exploration, and it would benefit the world to experience increased cooperation amongst the scientific community in many nations toward the common goals of mankind. I encourage all scientists in America—no matter your specialty—to join with this New Paradigm, and passionately promote the development of a new economics, and a new astronomy for a renaissance of scientific and creative

culture in America.

Mankind faces many challenges in our study of space; we have seen spectacular results from unmanned spacecraft in the exploration of the solar system. Imagine what we could do with a science based on Kepler, Leibniz and LaRouche. Imagine what we could do if LaRouche's Four Laws were implemented, and we saw a rebirth of true American System economics in the United States.

Isn't it time that we revive a *manned* space program in the United States? Isn't it high time that we go back to the Moon, and beyond?

For Further Reading

Follow the New Horizons spacecraft with NASA's app: <https://eyes.nasa.gov>

For more information about New Horizons: nasa.gov/mission_pages/newhorizons/main/index.html

Toward a Galactic Science Driver, a LaRouche PAC Scientific Team research report by Benjamin Deniston and Meghan Rouillard, *EIR* July 17, 2015.

Kepler, Johannes. *Harmonia Mundi* (Harmony of the World).

Kepler, Johannes, *Astronomia Nova* (The New Astronomy).

Leibniz, G.W.F., *Theodicy*.

24. According to Alan Stern, *thousands* of people showed up in person during the flyby to help celebrate the accomplishment; many millions followed it online, and the NASA website got so many hits that it crashed.