

**Phaser Telepropulsion Inc.** 1888 Century Park East • Suite 1900 • Los Angeles, California 90067  
(213) 644-0375

Roger Launius  
NASA History Office  
Mail Code ZH  
Washington DC, 20546-0001

November 7, 1997

Dear Mr. Launius:

As the Director of NASA's Historical Office, I'm sure that you would like to know the details of the invention that made it possible to explore the entire Solar System with instrumented spacecraft, but was kept from NASA by erroneous explanations for over three decades. I believe that I, as the inventor, have a responsibility to give you this history, so that it can be made known, preserved, and made available to the American people as part of their rightful heritage.

A close examination of almost every book on the history of space travel reveals that there is essentially only one method for achieving interplanetary space travel, namely reaction propulsion generated by expelling mass at high velocity. This was the method proposed by all of the early pioneers, e.g., Tsiolkovsky, Goddard, and Oberth. However, it was recognized early on in studying the technical feasibility of interplanetary space travel that the velocity requirements for exploring most of the Solar System were so high that they were well beyond the reach of chemical rocket propulsion. This was due to the fact that the exhaust velocities of chemical rocket engines were limited to rather low values that could not be increased because of fundamental thermodynamic reasons. Thus, all of these early pioneers (and all of the theoreticians and propulsion engineers that followed them into the 1960s) believed that the only way that most of the Solar System could be explored was by developing advanced propulsion systems such as nuclear or electric systems. This was viewed as a mathematical certainty resulting from the "rocket equation" upon which the entire theory of reaction propulsion, and hence the technical feasibility of space travel rested. Reaction propulsion was taken for granted as the only practical method for propelling a space vehicle. However, after years of effort, these advanced high-specific impulse propulsion systems were found to be beyond engineering feasibility. Thus, by the mid 1960's, it became evident to many theoreticians and propulsion engineers that most of the Solar System would remain out of reach and unexplorable for a very long time. But most of the Solar System was explored. And this was achieved by the invention of an entirely new method of interplanetary space travel that was so radical that it was originally dismissed at JPL as violating the law of conservation of energy.

During the summer of 1961, while working at JPL as a temporary graduate student in mathematics from UCLA, I invented this new method for exploring the Solar System.<sup>1</sup> It was based upon replacing direct-transfer trajectories to a target planet using reaction propulsion – that was taken for granted as self-evident at that time – with indirect trajectories passing one or more intermediate planets so that the spacecraft could be propelled by the resulting gravitational interactions. But after 36 years, I have yet to see one book on the history of space travel that accurately describes this fact. However, my invention was, in fact, recognized by the "peer-reviewed" professional literature and by JPL many years ago.<sup>2-4</sup> I have named the method "gravity propelled interplanetary space travel" or simply "gravity propulsion." It is popularly known as "gravity-assist trajectories."

I believe that the American people would like to know that there were actually two fundamentally different methods proposed for exploring the Solar System. One method, reaction propulsion, proposed and formulated by Tsiolkovsky, Goddard, and Oberth (an "engineering method" using a lot of hardware and propellant that Goddard invented) and described in all the history books on space travel which could not generate the high velocities required for exploring most of the Solar System, -- and my method invented in 1961 (a "mathematical method" that I invented by solving a mathematical problem called the "Three-Body Problem) that did enable the entire Solar System to be explored, but is never mentioned in any history book.

This is what my invention represented and accomplished, and why it is important in the history of space travel. It literally opened up the entire Solar System for exploration with instrumented spacecraft, and it did it with relatively small launch vehicles propelled by ordinary chemical rocket propulsion, and no subsequent reaction propulsion. Thus, it achieved what was believed to be a physical impossibility in 1961. Very few innovations in the history of science have made it possible to break through a fundamental energy barrier, believed to be technically impossible to penetrate, and obtain so much new scientific information for mankind.

The technical and historical details of the invention are described in a paper that I am enclosing herein.<sup>5</sup> It contains 170 published references and verifiable documents. I'm sure you will find it very interesting. Since this history is so fundamentally important, I am hoping that you will send it (along with all of the enclosures) to the National Archives, where it can be properly catalogued and made available to the general public. I'm sure that NASA, various scientific organizations, aerospace societies, and the authors of scientific and historical books, as well as ordinary citizens, would want to know the true facts behind the invention that broke the classical high-energy barriers of interplanetary space travel and opened up the entire Solar System to exploration with instrumented spacecraft. Since the invention was made by an American citizen, it represents part of our technological history as a nation that NASA, and our country should be very proud of. I would be willing to donate original documents or artifacts for examination and/or display by NASA, or by the Air & Space Museum of the Smithsonian Institution.

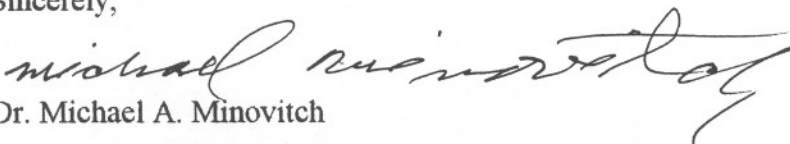
Since the Voyager 2 mission was only one of several high-energy deep-space missions that was made possible by the invention, you should also make the information in this paper<sup>5</sup> available to Ray James (or to anyone else connected with the writing of the history behind the Voyager 2 mission). You will find a great deal of historical and technical information about it in this paper,<sup>5</sup> such as how and when the gravity propelled encounter sequence, Earth-Jupiter-Saturn-Uranus-Neptune was really "discovered," and how it was numerically determined. These are important facts that have never been accurately published in the popular literature.

If there is any doubt about the authenticity of any of the UCLA documents enclosed herein they can be verified by contacting Professor Michael Melkanoff through UCLA's Department of Computer Science. Melkanoff became Chief of Computer Operations in December 1962 and gave me copies of the documents in 1974. I believe that Professor Melkanoff retired from UCLA in 1994. If anyone wishes independent verification of the FORTRAN listing of the computer code for my gravity propelled trajectory program, or a description of its operation, they could call Dr. Lowell

Wood at the Lawrence Livermore Laboratory. I solved all of the mathematical problems (it became my Ph.D. Dissertation in mathematics at the University of California, Berkeley), wrote all of the computer codes, and key-punched the entire 1960-1980 planetary ephemeris for all nine planets myself. Lowell helped me debug the computer code several times in early 1962.<sup>6</sup> (But it was improved many times.) If anyone wishes independent verification of any other document enclosed herein, or cited in the two IAF papers (IAA-90-630 and IAA-91-677) giving more details of the invention,<sup>7,8</sup> this can also be arranged.

Finally, I want to state categorically that I have never been convicted of any felony crime, and have never committed any felony crime in my entire life. I want to emphasize this because when the historical facts cannot be used to disprove a person's scientific claims regarding a scientific discovery that a research center does not want to "officially recognize," attempts are often made to attack the person's credibility. Please be very sensitive to this possibility, and record the names and statements of anyone attempting to attack the creditability of any of my papers by attacking my character. This has been done in the past. (See page 78 enclosure 6.) I have, in fact, hired a private investigator and an attorney to assist in taking legal action against such people. The information that I am forwarding to you has been known to JPL for over 30 years. But it was never revealed to NASA because certain individuals at JPL (that probably never included any Director) did not like the true history, and believed that they could "manufacture" a new history by giving the credit to someone who could make the history more acceptable to JPL.<sup>9-13</sup> To these individuals, scientific integrity is of absolutely no concern. In their minds, your job (to record and preserve the honest history) is a joke. The way it often worked in my case was that these individuals (who were low-level JPL managers) convinced higher-level managers that their erroneous stories regarding my invention were true. The higher-level managers simply passed the erroneous information to NASA,<sup>10</sup> (i.e., to NASA's Historical Office) and made to appear as the "official history". JPL also has its own "representatives" on the "Publication Committees" or "Boards" of almost every aerospace journal and professional society that can be used to control what is allowed to be published in the technical literature.<sup>14</sup> This is the reason why my invention is still not known, and will never be known in my life time if nothing is done about it. Dr. Pickering tried to help by identifying me as the inventor of gravity propelled space travel to a public television documentary production (WQED Pittsburgh) on the history of space travel called *Space Age*.<sup>15</sup> But the JPL rascals simply fed more erroneous information to certain selected authors where it was published suggesting that my invention was an old idea anticipated by Tsander, Lawden, and even by science fiction stories. (See page 74 enclosure 6.) But all of this was untrue.<sup>16</sup> Since I am not connected to any major institution that can help me in this situation, I am very vulnerable to these falsifications and distortions of history. I can only give you the documentation to prove what I did, and hope that you will use it to counter the rascals at JPL and put an end to their fraudulent attempts to destroy the integrity of the history behind the technical development of interplanetary space travel.

Sincerely,



Dr. Michael A. Minovitch

Enclosures (16)

1. Minovitch, M.A. "A Method for Determining Interplanetary Free-Fall Reconnaissance Trajectories," JPL, TM 312-130, August 23, 1961, pp. 38-44.
2. Hollister, W.M. and Menning, M.D., "Periodic Swing-By Orbits between Earth and Venus," *Journal of Spacecraft and Rockets*, Vol. 7, No. 10, October 1970, pp. 1193-1199.
3. Pickering, W.H., "The Grand Tour", *American Scientist*, Vol. 58, March/April 1970, pp. 148-155.
4. "Slingshot Magic" Chapter 7 in, *The Voyager Neptune Travel Guide*, (ed. Charles Kohlhas) JPL Publication 89-24, June 1, 1989, pp. 103-109.
5. Minovitch, M. A., "The Invention Of Gravity Propelled Interplanetary Space Travel: A Technical and Historical Presentation to the Jet Propulsion Laboratory," Oct. 1997.
6. Reichhardt, T., "Gravity's Overdrive," *Air and Space Smithsonian*, Vol. 8, No. 6, February/March 1994, pp. 73-78.
7. Dowling, R.L. et al, "The Origin of Gravity-Propelled Interplanetary Space Travel," 41st Congress of The International Astronautical Federation, October 6-12, 1990, Dresden, Germany, IAA Paper No. 90-630.
8. Dowling, R.L. et al, "Gravity Propulsion Research at UCLA and JPL 1962-1964," 42nd Congress of The International Astronautical Federation, October 5-11, 1991, Montreal, Canada, IAA Paper No. 91-677.
9. Bane, D. "First Stop: Jupiter," *Los Angeles Herald-Examiner*, Sept. 10, 1969, P. A-12.
10. "Mariner-Venus '73 Flight Genesis," NASA News Release No. 70-112, July 5, 1970.
11. Parker, P.J., "Grand Tour Spacecraft Computer," *Spaceflight* (British Interplanetary Society) Vol. 13, No.3, March 1971, pp. 88,120.
12. "Mariner 10 En Route to Mercury--Continues Query of Venus," *Mariner Venus/Mercury 1973 Status Bulletin*, Jet Propulsion Laboratory, California Institute of Technology, Bulletin No. 18, Feb. 6, 1974. (Slingshot Technique Sound, *NASA Activities*, Jan. 15, 1975.)
13. Kerrod, R. *The Journeys of Voyager: NASA Reaches For The Planets*, Mallard Press, London, 1990, pp. 8, 80.
14. Letter from Minovitch to Larry Dumas (JPL Deputy Director) dated October 30, 1997.



15. *Space Age*, Part 3: "The Unexpected Universe," A production of WQED Pittsburgh and NHK Japan in association with the National Academy of Sciences, 1992.
16. Minovitch, M.A., "Gravity's Overdrive: A Critique", June 1994.