



Héctor R. Rojas, Ph. D.
Doctorate in Astrophysics from the University of Paris
Mathematician from NASA's Lunar Apollo Program
Scientific Astronaut
Astronomical Observations from Spaceships
Maracaibo, June 10, 1928



CURRICULUM VITAE

Héctor R. Rojas was born in Maracaibo, capital of Zulia State, Venezuela, on June 10, 1928. As a child, he moved to Puerto Cabello where he stayed for a while to later establish the family home in the city of Maracay, capital of the State of Aragua. At the age of 22, in September 1950, he travelled to France and began higher studies. He graduated on June 7, 1956 with the highest academic mention awarded in that country, "Mention Très Honorable" (Summa Cum Laude).

VOCATIONAL TRAINING

Bachelor in Physics and Mathematics. First graduating class of the Liceo Agustín Codazzi of Maracay (Venezuela). Subsequently, he is attending two years of high school in Physics and Mathematics at Liceo Fermín Toro in Caracas.

- Degree in Physics and Mathematics from the Militaire Polytechnique Institut in Paris (France), obtaining simultaneously the rank of Colonel in the French Air Force.
- PhD in Physics and Mathematics from La Sorbonne in Paris.
- PhD in Astrophysics from La Sorbonne (Sorbonne), University of Paris.

He conducts important research at the Paris–Meudon Observatory, the Carnegie Institution in Washington D. C., and the Technological Institute of Monterrey, in the State of Nuevo León (México), in association with the Pan American College, Edinburg, Texas (USA). Because of the importance of his work, after developing a system of space coefficients of his own authorship, he was hired as a scientist for the



From August 1966 to August 1967, Héctor R. Rojas works at NASA's Manned Spacecraft Center in Houston, preparing a study on the characteristics of the lunar surface to support the project of taking human beings to the Moon.

Apollo Lunar Program of the National Aeronautics and Space Administration, better known as NASA. He is considered an author by the U.S. Space Agency, deserving the publication of all his scientific studies on the characteristics of the Moon and the atmosphere of Venus, which were published by the NASA–Houston Manned Spacecraft Center Publishing House, whose name in English was Manned Spacecraft Center (MSC), until 1973 when it was renamed Johnson Space Center (JSC).

The first four reports that he presented to NASA, constituted the set of investigations, analyses and conclusions essential for the success of the Apollo 11 mission. All his recommendations were accepted and incorporated into the strategic planning of the Apollo Lunar Program. Thanks to his work, he became the leading expert on the lunar soil, advised the astronauts of the Apollo 11 mission, becoming part of the team of scientific astronauts and was appointed candidate to travel to the Moon to carry out observations, studies and experiments in the field of Astrophysics.

MAIN SCIENTIFIC SPECIALTIES

- Classification of B and Be stars.
- Astronomical Spectroscopy and Photometry.
- Scientific Research in Space Sciences.
- Planetary Astrophysics.
- Astronomical Observations from Spacecraft and Scientific Astronaut.



As of February 20, 2019, the first three studies written by Héctor R. Rojas for the U.S. Space Agency are available on the NASA Technical and Scientific Information Program Server for the first time.

ESSAYS AND PUBLICATIONS

In the period 1956–1960 he publishes numerous articles in the "Comptes Rendus de L'Académie des Sciences de L'Université de Paris".

1 – "Analysis of the 21–cm Radiation of Neutral Hydrogen at Galactic Longitudes $l = 90^\circ$ and $l = 130^\circ$. Carnegie Institution of Washington, Department of Terrestrial Magnetism, Geophysics Laboratory, Washington D. C., 1962.

2 – "On the spectral classification of B stars using the UBV system". National Science Foundation. Astronomy Section, Washington, D. C., 1963.

3 – "The Spectral Classification of B Stars in the UBV System. Special Report Concerning an Astronomical Discovery in Stellar Photometry (Part I)". Pan American College Observatory, Edinburg (Texas). October, 1963. Sponsored by the National Science Foundation.

4 – "Analysis of spectrographic and photoelectric results of stars of spectral type B". Paris Observatory, Spectroscopy Section, Paris (France), 1964.

5 – "The double classification of B stars using a method of successive transformations". NATO, Science Advisory Committee, Paris (France), 1965.

6 – "A Study of the Microwave Radiation of the Atmosphere of Venus". Astro–Sciences Center, Chicago (Illinois). Study of the microwave radiation in the Atmosphere of Venus. Illinois Institute of Technology Research, Chicago. June, 1966. CLASSIFIED.

7 – "A Method of Predicting the Optimum Lunar Landing Area for a Manned Spacecraft". Report 1, NASA–Houston, Manned Spacecraft Center (MSC), Texas. December, 1966.



Between September 1967 and December 1968, Héctor R. Rojas works at the NASA–George Marshall Space Flight Center (MSFC), conducting a detailed analysis of the composition, morphology and topography of the lunar surface.

8 – "First Application of the Successive Transformations Method", Report 2, to compute the effective temperature of the lunar surface. NASA–Houston, Manned Spacecraft Center (MSC), Texas, 2nd edition, February 1967.

9 – "Second Application of the Successive Transformation Method to Predict the Safest Lunar Landing Site for an Astronaut," Report 3, to predict the safest landing site for an astronaut. NASA–Houston, Manned Spacecraft Center (MSC) Publishing, Texas, 2nd edition, July 1967.

10 – "Third Application of the Successive Transformations Method to the Analysis of Surveyor and Lunar Orbiter Photographs", Report 4, for the analysis of Surveyor and Orbiter lunar photographs. NASA–Houston, Manned Spacecraft Center (MSC), Texas. August, 1967. Current status: CLASSIFIED.

11 – "Analysis of the Composition, Morphology, and Topography of the Lunar Surface" to ensure a safe descent. NASA–George Marshall Space Flight Center (MSFC), Huntsville (Alabama). May, 1968.

12 – "Hot star research to correlate observations from Earth and from orbiting astronomical satellites". NASA–George Marshall Space Flight Center (MSFC), Huntsville (Alabama). November, 1968.

13 – "Brief Analysis of the Stellar Spectrum".

14 – "On Gravitation and Antigravitation".

15 – "Is the Continuation of Space Programs Justified?".

16 – "Agriculture and Solar Radiation".

17 – "On the Existence of the Supreme Being and the Behavior of Humans".

18 – "Analysis of Teletransmitted Photographs of the Earth".



Héctor R. Rojas' duties as a member of the science astronaut team in the 1969–1971 period remain NASA's best kept secret.

DISTINGUISHED MEMBERSHIPS

- Member of the Academy of Sciences of the University of Paris.
- Member of the Carnegie Institution of Washington D. C., (1961–1962).
- Member of the North Atlantic Treaty Organization (NATO).

AFFILIATIONS

- International Astronomical Union.
- Pan-American Astronomical Society.
- Sorocaba Astronomical Society.

LANGUAGES

- Multilingual; French, English, Spanish, German, Italian and Japanese.

PROFESSIONAL EXPERIENCE

1956 – 1958:

Dr. Rojas conducts a study of blue stars at the French Astronomical Observatories of Meudon and Haute-Provence, under the patronage of the Academy of Sciences of the University of Paris.

1958 – 1959: Develops a program of observations in geophysics at the Astronomical Observatory of Saint Maure (France), under the sponsorship of the Institute of Geophysics of the of the Institute of Geophysics of the University of Paris.

1959 – 1961: Research Associate at the Paris Observatory: Area of Stellar Spectroscopy. In charge of spectral classification and special analysis of data obtained from the observation of B and Be stars.



Héctor R. Rojas makes one of the most important discoveries in the world's scientific history in the early 1970s, while conducting experiments with stellar spectra in his laboratory at NASA–Houston's Manned Spacecraft Center (MSC).

1961 – 1962: Member of the Carnegie Institution of Washington D. C.: Makes observations of the neutral line of hydrogen at 21–cm, with the Carnegie 60–foot radio telescope for studies of galactic structure. Presents the results of the observations in the study entitled: "Analysis of the 21–cm Radiation of Neutral Hydrogen at Galactic Longitudes $l = 90^\circ$ and $l = 90^\circ$. Galactic Longitudes $l = 90^\circ$ and $l = 130^\circ$ ".

1962 (January): "Study of the applications of a low altitude astronomical observatory". NASA–Huntsville, George Marshall Space Flight Center (MSFC), Alabama.

1962 – 1964: Instituto Tecnológico y de Estudios Superiores de Monterrey, Nuevo León (Mexico) – Research Associate, Pan American College Observatory, Edinburg, Texas (USA). He makes observations of photoelectric photometry of stars with the collaboration of the National Science Foundation. In those years he develop the mathematical formulation of the "Rojas Method of Successive Transformations", which he later used at NASA to perform the extrapolations with the data of the equatorial region of the satellite, to perform the calculations that allowed him to precisely define the characteristics of the lunar topography and the coordinates of the best sites for landing manned missions on the moon, which were chosen for the safety of the astronauts.

1964 – 1966: Paris Observatory. High–precision spectral classification of B and Be stars, sponsored by NATO (North Atlantic Treaty Organization). North Atlantic Treaty Organization).



1966 (April) – 1966 (July): Astro–Sciences Center, Chicago (Illinois). Illinois Institute of Technology Research. Participates in a long–range planning study for NASA. His contribution was related to Earth–based observations made to study the planets.

1966 (August) – 1967 (August): NASA–Houston, Manned Spacecraft Center (MSC): Mathematician, physicist, astronomer and researcher for the Apollo Lunar Program, responsible for defining the optimum lunar landing area for an astronaut. On the basis of his two previous works, he presents study N° 3: "Second application of the method of successive transformations to predict the safest lunar landing site for an astronaut".

1967 (September) – 1968 (December): NASA–George Marshall Space Flight Center (MSFC), Huntsville, Alabama. Optimization of lunar observations –metric– and photometric experimentation with models, to obtain results congruent with the lunar conditions evidenced by the space probes. On the basis of his research, he presents study No. 4: Third application of the method of successive transformations for the analysis of Surveyor and Lunar Orbiter photographs.

A handwritten signature in blue ink that reads "Pierre Monteagudo".

Pierre Monteagudo

Official Biographer of Héctor R. Rojas

Research Writer

Scientific Writer

Professional Trainer

