

## Remembering Ramón María Aller in the International Year of the Astronomy 2009

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Ramón María Aller Ulloa was born in Pazo de Filguieroa (Lalín, Galicia-Spain) on 3 February 1878, in an ancestral house in Lalín. He studied secondary school at the Jesuit school in A Guarda and joined the Seminary in Lugo where, at the age of 20 and before becoming the Subdeacon, he graduated with a bachelor's and doctor's degree in Theology.

Upon finishing his priestly studies he promised himself that he would not assume any religious position or receive any type of monetary compensation for his ministry. At that time he decided to take on a second vocation and enroll in his first year of studies in the Exact Sciences at the University of Oviedo (1899-1900 academic year). He would later continue his degree at the University of Madrid and would graduate in 1904.

While studying at the seminary, Aller already had a 67mm telescope, a present from his maternal grandmother, Camila Ulloa. This would be the first instrument with which he would practice his love of astronomy. Years later, Miss María Lajosa Sánchez, also from Lalín, would present Aller with a magnificent theodolite made in London. It was with these instruments, located on a balcony in his house, that he would begin to systematically carry out astronomical observations, high-quality observations despite the limited resources at his disposal. His paper: "Observations of the Johannesburg Comet 1910a" was published

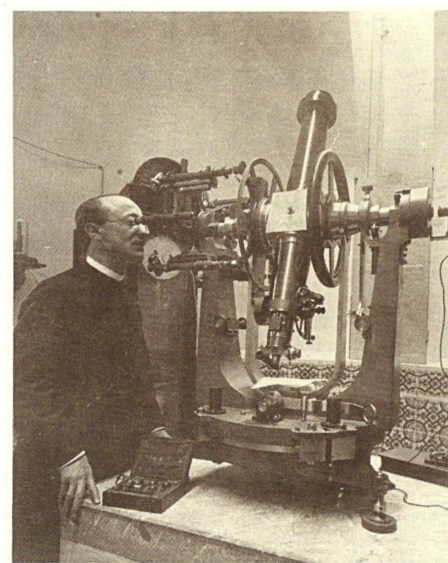


Figure 1.— R.M. Aller working at the Ocharan Observatory

in the Observatory of Madrid's 1912 annual, Spain. It was with this publication that he would begin to make a name for himself in astronomy circles in Spain.



Figure 2.— The Observatory of Lalín in 1924

With these new facilities, his observations reached admirable precision. He also carried out detailed theoretical studies on instruments. Many of his works appeared in the “*Revista de la Sociedad Astronómica de España y América*” (Journal of the American and Spanish Astronomical Society).

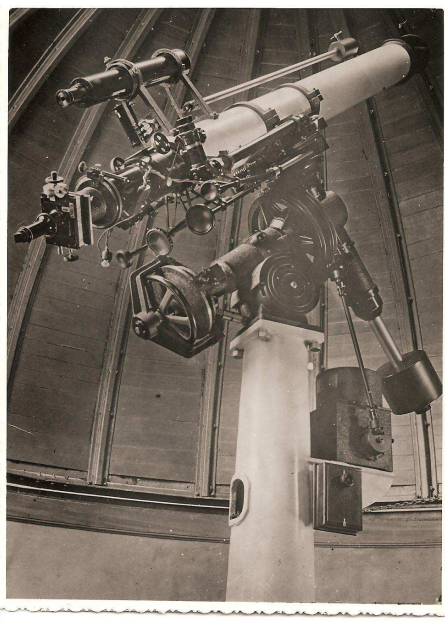


Figure 3.— The refractor Steinheil

later. Hardly had the new refractor been installed when Aller meticulously chose the scientific programme he would follow, the discussion of which can be found in his article

Between 1911 and 1920, he spent long summer periods in the Observatory that Luis Ocharan built in Castro Urdiales, and it was because of this experience that he came up with the idea to build his own observatory in Lalín. And so it was. In 1917, in the garden adjoining his house, he built what is usually referred to as his second observatory. This consisted of two wooden sheds, one of which housed the theodolite and the other the telescope. Other auxiliary instruments and a marine chronometer were also kept in the sheds.

It is curious, however, that his first book would be on Mathematics and not on Astronomy: “*ALGORITMIA*”, which he dedicated to Saturnino Aller, his uncle and the book's sponsor, was published in 1918. It was precisely with Saturnino's death that Aller would have the usufruct of his uncle's assets for many years. With the money this provided him, he decided to enlarge his collection of observation instruments with the addition of a 120mm refractor with a focal length of 1800mm.

Housing such an instrument required modifying the observatory's structure and building a dome. Aller himself supervised the changes and new construction, which were completed in 1924. He received the new instrument a year

“Programme of the Observatory of Lalín” published in 1932 in the “Arquivos do Seminario de Estudos Galegos” (Archives of the Galician Studies Seminar). The main aspects of the programme were 1) measurements of double stars, 2) the study of planetary surfaces, and 3) chance observations, including occultations, the position of comets, falling stars, and so on.

Aller first published his micrometric measurements of visual double stars in 1930, in the German journal “ASTRONOMISCHE NACHRICHTEN”, which was the main European astronomical journal at the time. Years later in the same publication, he would make the orbit of the double star STT77 known. Others would subsequently follow. One can safely say that it was Aller who introduced the study of double stars in Spain, a subject which would later enjoy an impressive school of followers in Santiago.

Before 1939, Aller published 43 works in Spanish and foreign journals, besides “ALGORITMIA”. He also wrote an exceptional manuscript on Astronomy which he had been working on since his youth. To these achievements, one must also add the study and design of scientific instruments which peaked the interest of German builders. All of this gave the Observatory of Lalín international fame despite its modest resources and one-man staff. What especially stood out was how Aller made full use of his instruments and the meticulousness with which he performed his calculations and observations. Apart from all of this, he dedicated his time to many other things like designing blueprints for houses and churches and even giving classes to young students in Geography, Mathematics, Latin, and so on. And all of this free of charge.

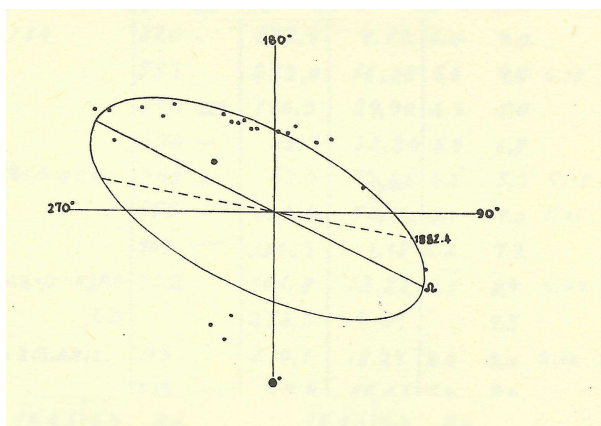


Figure 4.— The orbit of the system STT 77 obtained by Aller was the first double star orbit calculated in Spain

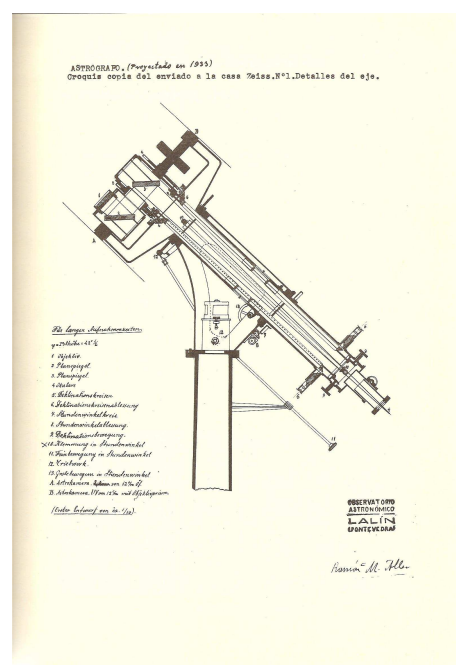


Figure 5.— The astrograph designed by Aller in 1933

He even authored the first biography

of Pedro Rodríguez González, which was published under the title of “El matemático de Bermés” (“The Mathematician from Bermés”).

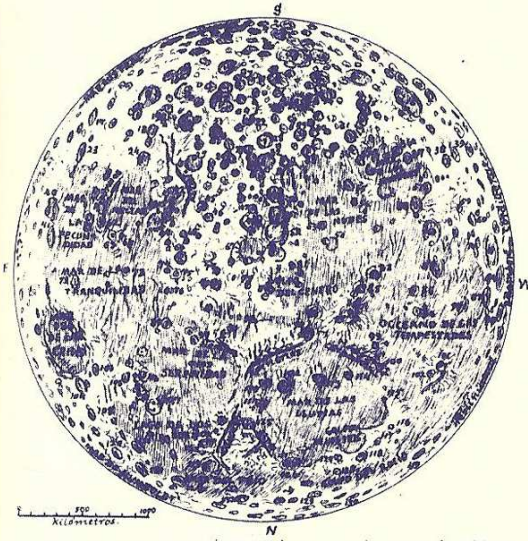
At the end of the Spanish Civil War, the University of Santiago was low on teachers, and someone suggested to Chancellor Carlos Ruiz del Castillo that Aller would make a valuable addition to the teaching staff. They convinced Aller to move to Santiago to teach Mathematical Analysis and Analytical Geometry in the Faculty of Sciences. Although the idea to move the Observatory in Lalín to Santiago had already been raised by professors Luis Iglesias and Isidro Parga before 1936, it was now with Aller in Santiago when the project took shape. It was undoubtedly Enrique Vidal-Abascal’s defence of the project before the Higher Council on Scientific Research (Consejo Superior de Investigaciones Científicas: the CSIC) that prompted the Chancellor’s Office to give its approval with the sponsorship of the CSIC.

The Astronomical Observatory of the University was built during 1943 and consisted of a single small building with domes in which the instruments from Lalín were installed, obviously with the hopes of enlarging its facilities and scientific observation materials in the future. The Observatory’s initial years in Santiago were particularly active ones. On 30 June 1943, Aller defended his doctoral thesis at the University of Madrid. The subject was another one of his favourites: “Some Experiences that are Worthwhile Carrying Out in Observations of Transits Across Vertical Circles.” That same year, he was named director of the Observatory and the first edition of his book INTRODUCCIÓN A LA ASTRONOMÍA (INTRODUCTION TO ASTRONOMY) was published, a magnificent book which includes the printed version of the entire manuscript mentioned previously.

The Observatory saw the addition of a transit telescope thanks to a donation by the CSIC who honoured Aller’s request for one to be able to continue his research on Positional Astronomy. In subsequent years the Observatory became a centre of excellent academic atmosphere around which astronomy and mathematics scholars converged. Aller was content being surrounded by such enthusiastic youth, especially keeping in mind the many years he spent in scientific solitude in Lalín. The Durán Loriga Theoretical and Mathematical Astronomy section was created within the Observatory in 1945, and included members like professors Enrique Vidal Abascal (its first director) and Eduardo García-Rodeja Fernández. It would serve as the seeds of the Mathematics Department in the Faculty of Sciences, today the Faculty of Mathematics.

Despite the limited observation resources available, practically the same ones that Aller had at his disposal in Lalín, the work carried out in the Observatory was intense, reaching its height in the 1940s and 50s. Some of the most remarkable events that took place at this time include the following:

tratante conocida en los detalles, no inferiores a medio kilómetro, y para distinguir los accidentes del terreno se han dado nombres a los mares, a algunos cubos de montañas y a los cráteres y volcanes. En la carta esquemática adjunta se indican los nombres de los mares y de los golfos; los de las cadenas de montañas, Doerfel, Pirineos, Altai, Cordilleras de Sierra Leona, Hemo, Apenninos, Carpatos, Herceas, etc.



1. Newton - 2. Moreto - 3. Clavio - 4. Scheiner - 5. Bacon - 6. Magino - 7. Bonfontano - 8. Schaller - 9. Fabricio - 10. Vlacq - 11. Hommel - 12. Maurolico - 13. Riccioli - 14. Wilheym - 15. Hevelius - 16. Riccioli - 17. Riccioli - 18. Riccioli - 19. Riccioli - 20. Riccioli - 21. Riccioli - 22. Riccioli - 23. Riccioli - 24. Riccioli - 25. Riccioli - 26. Riccioli - 27. Riccioli - 28. Riccioli - 29. Riccioli - 30. Riccioli - 31. Riccioli - 32. Riccioli - 33. Riccioli - 34. Riccioli - 35. Riccioli - 36. Riccioli - 37. Riccioli - 38. Riccioli - 39. Riccioli - 40. Riccioli - 41. Riccioli - 42. Riccioli - 43. Riccioli - 44. Riccioli - 45. Riccioli - 46. Riccioli - 47. Riccioli - 48. Riccioli - 49. Riccioli - 50. Riccioli - 51. Riccioli - 52. Riccioli - 53. Riccioli - 54. Riccioli - 55. Riccioli - 56. Riccioli - 57. Riccioli - 58. Riccioli - 59. Riccioli - 60. Riccioli - 61. Riccioli - 62. Riccioli - 63. Riccioli - 64. Riccioli - 65. Riccioli - 66. Riccioli - 67. Riccioli - 68. Riccioli - 69. Riccioli - 70. Riccioli - 71. Riccioli - 72. Riccioli - 73. Riccioli - 74. Riccioli - 75. Riccioli - 76. Riccioli - 77. Riccioli - 78. Riccioli - 79. Riccioli - 80. Riccioli - 81. Riccioli - 82. Riccioli - 83. Riccioli - 84. Riccioli - 85. Riccioli - 86. Riccioli - 87. Riccioli - 88. Riccioli - 89. Riccioli - 90. Riccioli - 91. Riccioli - 92. Riccioli - 93. Riccioli - 94. Riccioli - 95. Riccioli - 96. Riccioli - 97. Riccioli - 98. Riccioli - 99. Riccioli - 100. Riccioli - 101. Riccioli - 102. Riccioli - 103. Riccioli - 104. Riccioli - 105. Riccioli - 106. Riccioli - 107. Riccioli - 108. Riccioli - 109. Riccioli - 110. Riccioli - 111. Riccioli - 112. Riccioli - 113. Riccioli - 114. Riccioli - 115. Riccioli - 116. Riccioli - 117. Riccioli - 118. Riccioli - 119. Riccioli - 120. Riccioli - 121. Riccioli - 122. Riccioli - 123. Riccioli - 124. Riccioli - 125. Riccioli - 126. Riccioli - 127. Riccioli - 128. Riccioli - 129. Riccioli - 130. Riccioli - 131. Riccioli - 132. Riccioli

Fig. 131. Carta esquemática de la Luna. Los nombres de los mares y volcanes se han tomado de hombres célebres y figurados al pie de la carta. Las ramblas más notables son las que parten de Hevelius (n.º 92), pero abundan en los mares y aun a veces dentro de los circos. Lo que more ha representado en la carta son las radiaciones brillantes;

Figure 6.— A page of his hand written book *Introducción a la Astronomía*

- The defence of Enrique Vidal Abascal's doctoral thesis entitled "The Problem with the Apparent Orbit of Visual Double Stars" and directed by Aller (Madrid, 1944).
- The construction of a special base, following Aller's own design, for the transit telescope to carry out observations of transits across vertical circles  $\pm 45^\circ$  along with the construction of a sidereal time watch.
- The inauguration of the "Publications of the Observatory of Santiago" series where many of the scientific works carried out in the Centre are gathered, especially those dealing with micrometric measurements of visual double stars, occultations, obser-

vations of transits, as well as other theoretical works.

- The creation of the Astronomy Chair in the Faculty of Sciences in 1944, held by Aller until 1949, the year in which he was named Outstanding Astronomy Professor.
- The appointment of Aller as a member of the “International Astronomical Union Commission 26 (double stars)” in 1948 (Zurich). The following year he was named a member of the National Commission on Astronomy.
- The publication of the book “ASTRONOMÍA A SIMPLE VISTA” (ASTRONOMY AT A GLANCE ) in 1948.
- The expansion of the Observatory’s facilities with the addition of the Meridian room, the library, research offices and caretaker’s quarters.
- The incorporation of various grant holders and contributors among whom were José Pensado Iglesias (who would later become the director of the Observatory of Madrid); Rafael Cid Palacios (Astronomy Chair at the University of Zaragoza); Ángel Docobo Fernández (uncle to José Ángel Docobo Duránte, the Observatory’s current director); Antonia Ferrín Moreiras; Jesús Manuel Costa Seoane; Juan Antonio Zaera de Toledo; and many more. One cannot forget Aller’s faithful assistant and the Observatory’s caretaker, Venancio Froiz Gómez.
- Cid Palacios’s doctoral thesis directed by Aller entitled “ Contribución al estudio de estrellas dobles visuales” (A Contribution to the Study of Visual Double Stars).
- The publication of the 2nd edition of “INTRODUCCIÓN A LA ASTRONOMÍA” sponsored by the CSIC (1957).



Figure 7.— R.M.Aller at the Astronomical Observatory of the University of Santiago de Compostela

tributes, all of which he tried to avoid. The main one, without a doubt, was the homage paid to him by his neighbours in Lalín on 4 September 1960, on the occasion of his being

Between 1960 and 1963, in spite of being 83 years old, Aller still directed three more theses: Múgica Buhigas’s “ber die Anwendung des Theodolits in der Geodtischen Astronomia” (Munich, 1960); Zaera de Toledo’s “On determining the Orbits of Visual Double Stars. A Study of Various Methods. Applications” (Zaragoza, 1962); and Ferrín Moreiras’ “Observations of Transits Across Two Vertical Circles” (Santiago, 1963). It was during this time that Aller would begin to receive the first of many

granted the Great Cross of the Civil Order of Alfonso X, the Wise. Several streets in Madrid, Santiago, A Coruña, Vigo, and Lalín would later carry his name.

Aller preferred two principal lines of investigation: 1) the methods to determine coordinates based on observations of transits across two vertical circles and 2) visual double stars. But in the 53 years that transpired between his first and last articles, Aller also wrote with masterful precision on many other subjects, such as the observation of comets, planetary surfaces, instrumentation, watch making, aurora borealis, shooting stars, eclipses, transits, the description of his observatories, and so forth. In addition, between 1947 and 1949, he wrote a critical bibliography on astronomical treatises in the “Journal of Geophysics,” and honouring a request by the Seminar of Galician Studies, he authored the first biography on his fellow countryman Pedro Joseph Rodríguez González, an excellent geodetic scholar in the last century and former director of the Observatory of Madrid. He also made important contributions to the field of Mathematics through his articles on the parabolic theory of errors, sets and the principles of set theory, undefined finite and transfinite numbers, and so on.



Figure 8.— The Astronomical Observatory of the USC

His sensitivity and didactic refinement are immortalized in the books that he left behind. In “ALGORITMIA. Principios fundamentales de la Ciencia de los números” (ALGORITMIA. Basic Principles of the Science of Numbers), he discusses with clear precision the main subjects of mathematical analysis from the notion of whole numbers to differential equations. “INTRODUCCIÓN A LA ASTRONOMÍA” was a significant contribution. Both in its first edition (1943) as well as in the second (1957), he gives a detailed account of the different aspects of Astronomy in order to provide an overall vision of this branch of science. Both editions, which include numerous theoretical concepts,

practical examples and original drawings, were textbooks and reference books in the Faculty of Sciences for years. “ASTRONOMÍA A SIMPLE VISTA” is an interesting book aimed mainly at those who, lacking the necessary means, are equally interested in knowing the wonderful science of the stars. It is a well-documented book that filled an existing void at the time it was written. Now in its 50th anniversary, it has been reproduced jointly by the City Council of Lalín and the University of Santiago de Compostela.

From 1931-34 many of his essays written in Galician appeared in the magazine LOGOS. In 1989, these essays were republished by the Provincial Council of Pontevedra with a prologue by Xosé Filguiera Valverde. After falling ill in 1964, Aller returned to Lalín, where he died on 28 March 1966 at the age of 88. After his death he left his observation instruments as well as the majority of his library collection to the Astronomical Observatory of the University of Santiago.



Figure 9.— R.M. Aller, Full Professor at the USC

This man who dedicated his long and productive life to Science and to serving his fellow man, did not dispose of the necessary means of observation to expand his research. On repeated occasions he requested what he always promised himself, that is, to one day have at least a 30cm refractor, a tool which he considered the most basic yet indispensable observation instrument. However, his requests were never honoured by the official bodies to whom he appealed.

Considering the modest resources at his disposal, and the times and places in which his research was carried out, Aller’s scientific production was extraordinary: 78 publications (articles, notes, bibliographic comments, . . .), 4 books, 5 directed doctoral theses, 4 discoveries of double stars, numerous designs of scientific instruments, and an endless number of unpublished observations, calculations, notes and stellar catalogues. It is because of all of this that he is considered one of the principal Spanish authorities on Astronomy.

Nevertheless, his real legacy was, without a doubt, that which cannot be quantified: his generosity, modesty, humbleness, scientific rigor and dedication to others, which was always manifest. As Vidal Abascal so rightly stated, *Ramón María Aller’s true chef-d’oeuvre was his life.*