

**Sagrario Martínez-Carrera (1925–2011)**

Professor Sagrario Martínez-Carrera, born in Madrid on 10 May 1925, passed away quietly on 18 December 2011. An excellent crystallographer and a better person, she received her BS and PhD in Chemistry in 1948 and 1955, respectively, from the Universidad Complutense of Madrid. She held the positions of Associate Scientist, Research Scientist and Research Professor at the Spanish National Research Council (CSIC), and was always associated with the Department of Crystallography of the ‘Rocasolano’ Institute of Physical Chemistry (known as *The Rockefeller* because it was built in 1932 with funds from the Rockefeller Junior Foundation), except during the periods of her pre- and post-doctoral stays in the Netherlands and the United States.

It is not easy to describe the personality of Sagrario (‘Sarito’ for her dear nephews and siblings) differentiating between her scientific encouragement and the friendliness that she showered on her colleagues, especially those who learned directly from her. Tireless, always young in character, brave up to incredible limits, remarkably intelligent, maverick, but prudent, Professor Sagrario Martínez-Carrera was one of the scientists who undoubtedly can be considered as one of the outstanding exponents of Spanish science of the mid-twentieth century; she was heiress, in the second generation, of the primitive X-ray section that Julio Palacios set up in 1948 in the Institute Alonso de Santa Cruz, putting together all the scientists and equipment from the early Junta de Ampliación de Estudios (JAE), which was an independent teaching and research institution created in 1907 to help to end Spain’s isolation and forge links with European science and culture.

Professor Martínez-Carrera entered *The Rockefeller* in the early 1950s, at which time she was already directly involved in new strategic approaches and actions as a prelude to the automation in modern crystallography. In those years our intrepid Sagrario (with ‘mom in tow’, as she held her beloved mother in high respect) moved to the University of Amsterdam with the aim of what would subsequently be the goal of her scientific life – the incorporation of new crystallographic technologies in the CSIC and the rest of the

Spanish scientific community. However, her stay in the Netherlands was not the only crucial step for her scientific future. Some years later, in 1962, our untiring heroine went abroad again, this time to Pittsburgh University (USA) under Professor Jeffrey to improve her knowledge of the emerging 'electronic calculations'. Immediately after her return to Madrid, with an extensive background in programming in Fortran and Auto-code, she developed a series of software programs, essential to address the resolution of crystal structures. In 1966 she returned to the University of Amsterdam, where she published what later became her most beloved article, which received up to 258 citations, *The crystal structure of imidazole at  $-150^{\circ}\text{C}$*  [Martínez-Carrera (1966). *Acta Cryst.* **20**, 783–789].

Professor Sagrario Martínez-Carrera was fully engaged in a broad range of scientific activities. She played an active role in the Spanish Group of Crystallography and Crystal Growth, the Spanish Committee of Crystallography, the Scientific Advisory Committee of the CSIC, and was also directly involved in tasks of the International Union of Crystallography (IUCr). At the IUCr Executive Committee meeting held during the Third General Assembly in Paris in July 1954, it was proposed that the IUCr should organize specialized symposia between the assemblies. Therefore, in 1956 Professor Martínez-Carrera co-organized the first specialized symposia between the IUCr assemblies in Madrid. Similarly in April 1974, again in Madrid, she co-organized another inter-congress conference on the subject of anomalous dispersion, attended by such important figures as Dorothy Hodgkin (Nobel laureate in Chemistry in 1964), Johannes M. Bijvoet, Ralph W. G. Wyckoff, Paul P. Ewald, Rudolf L. Mössbauer, Lyle H. Jensen, Sidney C. Abrahams and a large number of great scientists who form part of the history of crystallography. Finally, in 1987 and concerning the underestimation of the accuracy of lattice constants, she was appointed by the Commission on Crystallographic Apparatus of the IUCr for organizing and coordinating a project called *Accuracy in Lattice Parameter Measurement*.

During these years and until 1990, the date of her retirement, Professor Martínez-Carrera supervised dozens of doctoral theses and trained many PhD students and university professors who visited the Department of Crystallography, although her modesty did not permit her to figure formally as their supervisor or teacher. She published over 100 articles in international journals that received over 1000 citations, reaping what we now call an '*h* index' close to 20, a number that nowadays seems easy to reach but it was not so for our heroine. She will be remembered as a good person and an extraordinary researcher, and especially for introducing crystallographic computing in Spain.

In addition, Professor Martínez-Carrera always had a kind word and the right answers for all who needed her, and not only to talk about research. She was part of the generation of extraordinary women of our science, of the CSIC, of universal science, who had to pass through bitter moments and had to win her place, without noise, even in the difficult context of male chauvinism typical of those years. As part of her humility, Sagrario never released her contributions to (and prominence in) several books published beyond the Spanish borders, such as *Women of Science, Righting the Record*, edited by G. Simon and Patricia Farnes Kass, and *Notable Women Scientists*, edited by Pamela Proffitt. The 70s and 80s passed and finally in 1990 she retired, disappearing from the laboratory with the elegance that characterized her until the end of her life, leaving behind a lot of good work and plenty of affection for all those who knew her. The author of these words, on behalf of the Spanish crystallographers, raises a glass and symbolically dedicates, with love and respect, a *Farewell, dear Sagrario!*

### Martín Martínez-Ripoll

Department of Crystallography and Structural Biology  
Institute of Physical Chemistry 'Rocasolano', CSIS  
Madrid  
Spain