Real Sociedad Española de Física
R.S.E.F.

Spanish Royal Physics Society
Facultad de Ciencias Físicas, UCM
Plaza de Ciencias, 1
28040 Madrid
Tel. +34 91 394 4350 – 4359
web: rsef.org

Application to name the ***Residencia de Estudiantes*** in Madrid EPS Historical Site

The ***Residencia de Estudiantes*** was created in Madrid in 1910 by the *Junta para Ampliación de Estudios e Investigaciones Científicas* (JAE for short), itself established in 1907. Until 1936 –the beginning of the Civil War- the ***Residencia*** remained a vibrant, fruitful hub for scientific and artistic work and exchange between Spain and the rest of Europe. It was a major College with library and laboratories with the main objective of promoting the growth of science and culture in Spain, with particular emphasis on young residents. The success of the ***Residencia*** was enormous until 1936; so much so that the first third of the XXth century is often considered as the *silver period* of Spanish Science and, indeed, so it was for physics.

In 1915 the ***Residencia*** was moved to its permanent and present site in Pinar street at the 'Hill of Poplars' (a name given by the future (1956) Nobel prize in literature Juan Ramón Jiménez, attached to the ***Residencia***), in the Northern side of Madrid. Its first director, Alberto Jiménez Fraud, a recognized pedagogue, ran the ***Residencia*** as a meeting place open to creativity, intellectual and interdisciplinary dialogue. The ***Residencia*** and the *JAE* were both the product of the innovative and reformist ideas generated by the *Institución Libre de Enseñanza*, initiated by Francisco Giner de los Ríos in 1876; he was a professor and philosopher at Madrid University.

The mission of the ***Residencia*** was to complement university education by creating an exciting intellectual and living environment for its residents. It strongly encouraged the constant dialogue between Science and the Humanities, welcomed and fostered avant-garde ideas from abroad, and became the focal point for spreading modernity in Spain. Many of its residents were among the leading figures of Spanish culture in the twentieth century, such as the poet Federico García Lorca, the painter Salvador Dalí, the film maker Luis Buñuel, the future Nobel Prize winner Severo Ochoa (Physiology or Medicine, 1959), the music composer Manuel de Falla, the poet Manuel Machado and many others; we shall come to the physicists below.

Many prominent European figures came to the ***Residencia***: Henri Bergson, Igor Strawinski, Walter Gropius, Alexander Calder, Le Corbusier, etc, including the most prestigious scientists. Among them, one has to mention the visits of Albert Einstein and Marie Curie. Albert Einstein's visit took place 9-march-1923, and he delivered at the ***Residencia*** the conference *A resume on the theories of relativity*. Einstein was introduced -and his conference translated from German- by the well known philosopher José Ortega y Gasset, who very early had noticed the importance of Einstein's relativity(ies) and the relevance of the new ideas about spacetime. The invitation came through the active scientific contacts that Albert Einstein regularly had with prominent Spanish scientists, such as the mathematician Julio Rey Pastor,

the physicist, engineer and polymath Esteban Terradas (of whom Einstein said that he was one of the four most intelligent men he had ever met), Santiago Ramón y Cajal (Nobel Prize in Physiology or Medicine, 1906) and with academicians of the Royal Academy of Exact, Physical and Natural Sciences in Madrid, among others. It is worthwhile mentioning here –it is not widely known- that Einstein was so pleased with his visit that in 1933 he considered establishing himself in Madrid and even accepted a chair. However, the growing political instability in Spain continuously delayed his arrival, which finally did not take place.

In April 1919 Marie Curie had already come to Spain with her daughter Irene to participate in the *Primer Congreso Nacional de Medicina*, but her first visit to ***Residencia*** took place in 1931 invited by the Second Republic Government. She delivered the 23rd of April a conference in the ***Residencia***, *La radioactivité et l'évolution de la science*, acting as Chair the prominent Spanish physicist Blas Cabrera. Marie Curie visited the ***Residencia*** a last time in 1933 (she died in 1934), where she acted as Chair of a conference on *The future of culture*. Among the illustrious people gathering for the occasion were Manuel García Morente, J. B. S. Haldane, Paul Langevin, Salvador de Madariaga, Gregorio Marañón, Miguel de Unamuno, Paul Valéry, Jules Romains and many others.

Blas Cabrera was the director of the *Laboratory of Physics Research* in the ***Residencia de Estudiantes***, created in 1910 by the JAE. Later, the laboratory was expanded and moved to a new, nearby building, 'the Rockefeller' (it had been financed by the Rockefeller Foundation). This laboratory, by then *Instituto Nacional de Física y Química*, hosted many prominent European physicists, as the Nobel prizes Lawrence Bragg and Manne Siegbahn; this last was instrumental in helping with the equipment of the laboratory (an spectrograph was given his name). Cabrera, a world leader in magnetism studies, was a member of the *Commission Scientifique Internationale* of the Int. Solvay Physics Institute and participated at the Solvay Conference of 1930. It may be worth mentioning that Cabrera, a Professor of Physics at Madrid University, was instrumental in the creation, in 1903, of the Sociedad Española de Física y Química (its first president was José Echegaray, a mathematician and Nobel prize of Literature in 1904), which later split into the present Spanish Royal Physics and Chemistry Societies. After the Civil War, Cabrera's *Instituto Nacional de Física y Química* and its laboratories were transformed into the scientific kernel of the newly created *Consejo Superior de Investigaciones Científicas* (CSIC). The CSIC absorbed the state of the JAE and the ***Residencia de Estudiantes***, which lost its original aims and character. Cabrera himself –as many others- died in exile. He was the elder of a family of illustrious physicists. Among them, his son Nicolás was Professor of Physics at Virginia Univ. and later at the Autonomous Univ. of Madrid; his grandson, Blas, has made an important career in Stanford.

Other relevant visitors to ***Residencia*** were the physicist Maurice de Broglie (Maurice, brother of Louis, was repeatedly proposed for the Nobel Prize), who delivered the conference *La lumière and ce qu'en pense la science d'aujourd'hui* the 27-nov-1930. Shortly after, the British astrophysicist Arthur S. Eddington delivered the 18-dec-1930 a conference on *The stellar universe*. The previous year (22-april-1929), the Swiss physicist Paul Scherrer -then an expert in X-ray crystallography- also visited the ***Residencia***. This first visit was later extended by the physicist Julio Palacios, using the Cajal Chair, for longer periods. Scherrer became an illustrious fellow of the RSEFQ and established (and kept) contacts with Spanish physicists as *e.g.*, Otero Navascués (who made important contributions in the field of optics and

was one of the founders of the future Junta de Energía Nuclear, now *Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas*, CIEMAT), Luis Bru, Mariano Velasco and Juan Cabrera. Scherrer also hosted them at his laboratory at the ETH Zurich, where he (experiment) and Pauli (theory) placed the ETH in a high position in European physics. For instance, Scherrer's course at the ETH, on the influential *Atombau und spectrallinien* book (1919) by Sommerfeld, was followed by Luis Bru, later a professor at Madrid University.

Another relevant Spanish physicist involved in the activities of ***Residencia*** was the already mentioned Julio Palacios, a professor of Physics at Madrid University who, from 1929 to 1933, was a member of the Patronage Committee of the ***Residencia***. Moreover, Prof. Palacios and other colleagues, professors and researchers in Madrid University, along with the spectroscopists Miguel A. Catalán and Enrique Moles, regularly participated in the 'evening seminars' organized by the students of ***Residencia***. A sample of topics: *Hertzian waves and light* (Blas Cabrera), Nature and properties of Roentgen rays (Julio Palacios*), Trasmutation of elements* (E. Moles), *Spectral lines* (M.A. Catalán). M. A. Catalán is worldwide recognized for the discovery of multiplets studying the spectrum of manganese (1922); E. Moles was named by Blas Cabrera, in 1927, Head of the *Laboratory of Chemical Physics* attached to the *Physics Laboratory* of the ***Residencia*** and, under Cabrera's direction, initiated research in magnetochemistry. The first pioneering women scientists in Spain were also attached to the activities of the ***Residencia***, as Felisa Martín Bravo, the first physics PhD woman in Spain, and Piedad de la Cierva, both working in X-ray physics; they had followed the courses by Scherrer at the ***Residencia's*** *Physics Laboratory* on the applications of X-rays to crystallography, rare earths structure, colloids, etc. From 1931 to 1937 a total of thirty six women scientists developed their research in the Laboratory of Physics of ***Residencia***. To accommodate women scientists, there was a women counterpart of the ***Residencia,*** the *Residencia de Señoritas*, where Marie Curie, who in her first visit to the ***Residencia*** was accompanied by her daughter Ève, was lodged.

Besides these scientific activities, the ***Residencia*** pioneered the diffusion of scientific culture through the *Comité Hispano-Inglés* (presided by the British Ambassador and the Duke of Alba) and the *Sociedad de Conferencias*. To have a flavour of the speakers, we shall mention that Howard Carter (1924), G.K. Chesterton (1926), J. Maynard Keynes (1930), H.G. Wells (1932) and many others were brought to the ***Residencia*** by the *Spanish-English Committee*, and that the *Conferences Society* of the ***Residencia*** began in 1924 with speakers as L. Frobenius, Paul Valéry, Louis Aragon, Paul Claudel, G. Duhamel, Max Jacob, the count of Keyserling, Anna de Noailles and the Spaniards J. Ortega y Gasset, Gregorio Marañón, Batolomé de Cossío, M. Gómez–Moreno, the physicists already mentioned, and many others.

From the architectural point of view, the ***Residencia*** was designed (both the twin pavilions and the so called Transatlantic, where the Laboratory of Physics was located) by the architect Antonio Flórez; works lasted from 1911 to 1915. Flórez was known as the 'architect of colleges and schools' due to his many buildings of this type. With a functional style, he was particularly interested in creating luminous ambiances in the rooms and by not using expensive materials of construction.

Without the intention of presenting here an exhaustive history of the ***Residencia***, the examples mentioned demonstrate the important influence that it had in the development of Spanish science and culture from the mid-1910s until 1936. Moreover, and this is here especially important, the ***Residencia*** *had a decisive*

influence in the beginnings of Spanish physics. Although some of the physicists associated with the *Residencia de Estudiantes* went into exile during or after the Civil War, a few of them returned later and others remained. It can be truly asserted that Spanish Physics would not be the same without the development it had in the twenties and the thirties of the past century, a progress which was intimately tied to the scientific activities and laboratories of the *Residencia*. Today, we can only express regret towards the fact that such a brilliant beginning, which led to the mentioned silver period of Spanish Science –and especially physics- was partly lost due to the ravages of the Civil War that came shortly after.

Today the ***Residencia*** (postal address: Pinar, 23 28006-Madrid), now without laboratories, continues to pursue cultural activities through publications, workshops, conferences, exhibitions, all oriented to a diversified audience, aiming to keep the brilliant spirit of its golden old years. As a deserved homage to its scientific and humanistic history, the ***Residencia*** was declared in *2007 European Heritage Site*. As for the Consejo Superior de Investigaciones Científicas (CSIC), its scientific origins are deeply rooted in the first laboratories of the ***Residencia de Esudiantes,*** Cabrera's *Laboratory of Physical Research* with is residents and visitors, later *Instituto Nacional de Física y Química*, finally moved just 200 meters away to the 'Rockefeller' building in 1932 (Sommerfeld, Weiss and Scherrer attended its dedication). The 'Instituto Rockefeller', as it was then popularly known, is now part of the CSIC complex, and the CSIC itself is the largest Spanish public research Institution.

For all the above reasons, the Royal Spanish Physics Society (RSEF) wishes to present the ***Residencia de Estudiantes*** *as a candidate for an EPS Historical Site.* If such a declaration is granted, it will no doubt contribute to exhibit the importance of science as an essential link to culture and education under the Spanish National Patronage of the ***Residencia***. *The declaration of EPS Historical Site will equally stress and recognize* ***the essential role that the*** **Residencia de Estudiantes** ***played in the birth of modern physics in Spain.***

Needless to say, the present Head of the *Residencia de Estudiantes,* Dña. Alicia Gómez Navarro, knows of this RSEF initiative and supports it fully, unreservedly and very warmly.

28 April 2014

Signed in representation of the Royal Spanish Physics Society:

José Adolfo de Azcárraga
President, RSEF

María Luisa Calvo
Vicepresident, RSEF