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Preface

Special issue dedicated to Professor Jesús Sánchez-Dehesa on the occasion of his 60th birthday

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An international conference "Special Functions, Information Theory and Mathematical Physics" was organized on September 17–19, 2007 in Granada with lectures by his friends, colleagues and scientific collaborators. Some of the lectures are published in this volume together with other papers corresponding to several contributed talks. We are happy and honored to be guest editors of this special issue dedicated to our colleague and friend, whose contents reveal the broad and interdisciplinary character of the Jesús's scientific interest along his life.

A walk around our colleague's scientific career (see the short biographical notes below) makes it clear the wide and intense activities he has broached and overcome. What is the secret of a scientist who has been successfully involved in such an amount of relevant scientific projects? Certainly, at the heart of his outstanding accomplishments there is a strong intellectual curiosity and versatility, a swift and keen perception of the connection between physical and mathematical problems and, above all, seemingly inexhaustible energy resources even bigger than those of their current young collaborators and students.

Of his manifold activities as a referee, scientific adviser, committee member, ... maybe one driving strand deserves special mention. It is the devoted and enduring commitment ("inasequible al desaliento", we say in Spanish) with science and its development in our country (and beyond), fostering and promoting in any forum the creation of the essential infrastructure it requires, encouraging students and young researchers to take advantage of them and constantly instigating international scientific exchange.

Measuring scientific production as a function of time shows that Jesús's production rate and scientific activity are still increasing. So let us finally hope this fortunate trend can be extrapolated for many years to come, and we will be the grateful beneficiaries of many more enlightening contributions.

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1. Some biographical notes

Jesús S. Dehesa was born on September 21, 1947 into a farming family in Manzaneque (Toledo, Spain), where he lived until he was 12 years old. Then, his family moved to Madrid where he entered Universidad Complutense to study chemistry, but soon he switched to physics and mathematics. During his university years, bringing work to help his family into line with his studies, he also devoted some time to his hobbies, among them at that time, to attend numerous philosophy and literature readings at the Ateneo de Madrid, which he considers his second university.

Jesús obtained his degree in Physics at the Universidad Complutense de Madrid, where he studied from 1965 to 1969. His excellent grades provided him a position as Assistant at the Department of Theoretical Physics at Universidad Autónoma de Madrid, where he stayed for two years. Later he moved to the Institute de Physique Nucleaire Thèorique d'Orsay, Paris, and Institute for Theoretical Physics of Trieste to work in Nuclear Physics at low energies. Then he was hired by the Kernforschungsanlage Jülich to work at the Institut für Kernphysik and entered Universität Bonn, where he followed various academic courses in Mathematics and Physics. There he earned a physics Ph.D. in 1977 for a thesis on giant resonances of doubly-closed nuclei. In parallel with this subject, his enthusiasm and liking for mathematics was such that he defended a second doctoral thesis on asymptotics of zeros of orthogonal polynomials at the University of Zaragoza.

Named as Assistant Professor (1977–1985) at the University of Granada, in 1985 he was promoted to Professor in Atomic, Molecular and Nuclear Physics at the same University, where he has been very active from both academic and research standpoints. For several years he has been Chairman of the Division of Physical Sciences, and Vice-chairman for Research of the University of Granada. During this period he kept a very close connection with various German research centers, mainly KFA Jülich where he made several research stays. He has formed part during many years of the Junta de Facultad de Ciencias, and the Claustro de la Universidad as well as to the Government Council of the University. In 1993 he was cofounder (and director from this year until 2004) of the Research Institute "Carlos I" for Computational and Theoretical Physics of the University of Granada, which includes physicists of various fields and applied mathematicians. In 2006 he was elected as a permanent member of the Academia de Ciencias Exactas, Físico-químicas y Naturales de Granada.

At Granada's, he served as research supervisor to 9 Ph.D. students (see Table) plus three more who are presently doing his doctoral work.

Antonio M. Lallena (1984)	Elvira Romera (1997)
Franciso J. Gálvez (1985)	Rosario González Férez (2001)
Juan Carlos Angulo (1993)	Pedro López Artés (2002)
Alejandro Zarzo (1995)	Pablo Sánchez Moreno (2008)
Rafael J. Yáñez (1996)	

They are now carrying on his academic legacy as assistant professors, associate professors and professors themselves at various physical and mathematical departments of different universities. He also supervised 13 Master students in Physics and Mathematics, including Enrique Ruiz Arriola, M. Angustias Sanchez Buendía, Francisco Dominguez Adame, I. Porras, Sheila Lopez Rosa, Daniel Manzano Diosdado, Beatriz Olmos Sánchez, and six more (Angulo, Zarzo, Yáñez, Romera, Gonzalez Férez and Sánchez Moreno) who are already listed in the Table because they went on to complete a Ph.D. under his supervision. Jesús always showed his pleasure when he met their Ph.D. students referring to them as his academic children. He has been mentor of many visiting researchers and postdoctoral fellows who worked in his laboratory, including Victor A. Madsen, Paul Nevai, Sigfried Krewald, André Ronveaux, Toshikatsu Koga, Alexander I. Aptekarev, Vladimir Buyarov, Arnold F. Nikiforov, José Luis Cardoso, Renato Alvarez Nodarse, Jorge Sánchez Ruiz, Ajit J. Takkar, Vladimir N. Sorokin, Khalidas D. Sen, Angel Ricardo Plastino and Rodolfo Esquivel as well as several of his former Ph.D. students.

Jesus S. Dehesa's research work has been very productive. He has published 177 papers and reports on a large variety of topics including nuclear giant resonances, meson exchange currents, electron scattering, macroscopic properties of many fermion systems, monotonicity properties of atomic charge, momentum and electron-pair densities, algebraic and spectral properties of orthogonal polynomials and other special functions of mathematical physics and applied mathematics, entropic functionals of orthogonal polynomials, Rydberg atoms, information-theoretic measures of quantum-mechanical systems, and D-dimensional physics. His wide scope is best appreciated by perusing his list of publications. He sometimes said that the shell structure of matter, the density functional methods, the hydrogenic systems, the information measures and the constructive analysis were the threads which held his work together.

The breadth of his work makes it difficult to pinpoint the field for which he was most appreciated. We would guess that he will probably be remembered most for his work on giant resonances, macroscopic and spectroscopic properties of atomic systems, and information properties of quantum systems and orthogonal polynomials. In particular, his influence has a lot to do with Spain becoming a powerhouse of orthogonal polynomials. A bibliometric perspective of the impact of his work reveals that his fifteen most-cited publications are on nuclear giant resonances, atomic structure, and information properties of quantum systems and special functions.

Jesus S. Dehesa served on European physical and mathematical communities in many ways. For several years he served on various Spanish committees to push the government to be more active in a number of scientific and technological areas. He enjoyed organizing national and international conferences and symposia. He worked particularly hard as the chair of the Seventh International Symposium on Orthogonal Polynomials and its Applications (1991) and the Symposia

on Electron Scattering with Nuclei (1988), Recent Advances in Theoretical Physics (1989) and Density Functional Theory in Atoms, Molecules and Nuclei (1990), and as a co-chair (with various researchers) of the International Workshops on Nuclear Giant Resonances (1979), Interacting Bosons in Nuclei (1980), Mathematical and Computational Methods in Nuclei (1982), Condensed Matter Theories (1983), Density Functionals of Fermionic Systems (1995) and Special Functions and Rational Approximations (2002). Jesús S. Dehesa coedited the proceedings of five international meetings, and served as referee of at least twenty physical and mathematical international reviews of high scientific level. Moreover, he is member of the following professional societies: European Physical Society, American Physical Society, Spanish Physical Society, American Mathematical Society, Society for Industrial and Applied Mathematics and Spanish Mathematical Society. It is worth mentioning the leadership of Jesús in a series of INTAS European Research Projects, that started in 1993, joining researchers of the European Union and Russia in a successful collaborative international group of scientists.

Jesús lectured, mostly at the University of Granada but also at other American and European universities, in atomic physics, nuclear physics, quantum physics and applied mathematics. Also, he delivered numerous Ph. D. courses on the areas of his scientific interest listed above.

We cannot finish this journey through Jesús's biography without very special mention to his wife Gloria (an associate professor of Psychology at the University of Granada) supporting him in very many ways and very many times and his two sons: Álvaro (economist) and Marcos (presently, at his last year in telecommunication technology).

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