



Parte A. DATOS PERSONALES

Fecha del CVA

27/10/20

Nombre y apellidos	ENRIQUE RUIZ ARRIOLA		
DNI/NIE/pasaporte		Edad	
Núm. identificación del investigador	Researcher ID	A-9388-2015	
	Código Orcid	0000-0002-9570-2552	

A.1. Situación profesional actual

Organismo	Universidad de Granada		
Dpto./Centro	Física Atómica, Nuclear y Molecular		
Dirección	Granada, Andalucía, España		
Teléfono	958 246170	Correo electrónico	earriola@ugr.es
Categoría profesional	Catedrático de universidad	Fecha inicio	02/11/2000
Espec. cód. UNESCO	220704, 220712, 220703, 220710, 220923		
Palabras clave	Física Atómica, Física Nuclear, Física Hadronica		

A.2. Formación académica (título, institución, fecha)

Licenciatura/Grado/Doctorado	Universidad	Año
Licenciado en Ciencias	Universidad de Granada	1985
Doctor en Física	Ruhr-Universität, Bochum (Alemania)	1990

A.3. Indicadores generales de calidad de la producción científica (véanse instrucciones)

Número de sexenios de Investigación: 5 (último concedido 2010-2015)

Número de tesis doctorales dirigidas: 5

Citas Totales en Web of Science: 5079

Promedio de citas en el periodo 2011-2016: 7.04

Publicaciones totales en primer cuartil (Q1): 109 (de las 228 totales indexadas en WoS)

Índice h: 37 (según WoS)

Parte B. RESUMEN LIBRE DEL CURRÍCULUM (máximo 3500 caracteres, incluyendo espacios en blanco)

Puestos y actividades desempeñadas. Fuí **Tesinando** de Licenciatura en la Universidad de Granada (UGR) en 1985 bajo la dirección de Jesús Sánchez-Dehesa. Realicé mi **Tesis Doctoral** en el Institut für Theoretische Physik, Ruhr-Universität Bochum (Alemania) entre 1985-1990 bajo la dirección de Klaus Goeke y financiado por la Deutsche Forschungsgemeinschaft (DFG). Por dicha tesis obtuve el **premio "Preis an Studenten"**, dotado con 500 DM. Fuí **Profesor Asociado** (1990-91), **Profesor Interino** (1991-92) y **Profesor Titular de Universidad** (1992-2000). Estuve como **Profesor Visitante** en el National Instituut voor Kern- en Hoge Energie Fysica (NIKHEF), (Amsterdam, Países Bajos) en 1994-1995 financiado por el Fundamenteel Onderzoek der Materie (FOM) Holandés. Soy **Catedrático de Universidad** desde 2000 en la UGR.

Idiomas. Castellano (materno), Alemán e Inglés (fluidos), Neerlandés (medio), Francés (básico).

Publicaciones en revistas ISI en numeros. 270 publicaciones con 50 colaboradores. **Colaboradores frecuentes:** K. Goeke (28), W. Broniowski (69), L.L. Salcedo (51), E. Megías (39), J. Nieves (22), J.E. Amaro (36), R. Navarro (32), V.S. Timoteo (17), S. Szpigel (17), M. Pavon Valderrama (22), A. Calle Cordon (14), P. Masjuan (9), D. R. Entem (7). **Revistas:** Physical Review D (46), Physical Review C (35), Physical Review Letters (2), Physics Letters B (32), Nuclear Physics A (32), Physical Review A (1), Nuclear Physics B (1), Zeitschrift für Physik (4), Few Body Systems (11), Annals of Physics (4), European Physical Journal A (1), European Physical Journal C (1), Journal of Physics G (6), Nuclear Physics B Supplement (2), AIP Conference Proceedings (13), Acta Physica Polonica B (11), Journal of Mathematical Physics (1), Applied Mathematics Letters (1), Journal of Statistical Physics (1), Modern Physics Letters A (2).



Temas (algunas palabras clave)

Grupo de renormalización en interacciones nucleares, correlaciones nucleares, interacción nucleón-nucleón, análisis de desfasajes, análisis de errores, estructura nuclear mediante reacciones de iones pesados ultrarrelativistas, Cromodinámica Cuántica a temperatura finita, teorías efectivas, física hadrónica a energías intermedias, resonancias, simetría quiral, desarrollos de gran número de colores., distribuciones de partones simples, dobles y generalizadas.

Difusión, charlas y congresos

42 seminarios en centros de investigación o universidades nacionales o extranjeras
86 asistencias a congresos internacionales
80 comunicaciones orales presentadas en persona a congresos internacionales
45 estancias de investigación en instituciones científicas superiores a 1 semana
Lecturer en Escuelas Internacionales: Zakopane (Polonia 2014), Andree Swiecka (Brasil, 2017), HUGS (JLAB, EEUU, 2017)

Intercambios regulares con Instituciones y sus investigadores

Institute of Nuclear Theory (Cracovia, Polonia) W. Broniowski.
Jefferson National Laboratory (Virginia, EEUU) J.L. Goity.
Universidade de Campinas (Brasil) V. S. Timoteo.

Proyectos de Investigación, Gestión y Docencia

Participación en 26 proyectos de investigación.
IP de 5 proyectos nacionales.
Organización de 3 reuniones científicas internacionales
Docencia regular en la UGR a tiempo completo 54 asignaturas (licenciatura o grado) de Física y 36 cursos de Doctorado o Master (3380 y 755 horas respectivamente).
Profesor fundador del programa FISYMAT y miembro de su comité científico.
Referee en 54 ocasiones de las revistas en las que publico.
He evaluado proyectos para la ANECA (2), la DFG alemana (2), la NRF sudafricana (2), el DOE estadounidense (2) y el CONICET argentino (1) y proyectos ERC europeos (2)

Parte C. MÉRITOS MÁS RELEVANTES (ordenados por tipología)

C.1. Publicaciones (Incluya una reseña completa de las 5-10 publicaciones más relevantes. Elimine, si es el caso, aquellas que no considere relevantes)

- Signatures of alpha clustering in light nuclei from relativistic nuclear collisions W. Broniowski, E. Ruiz Arriola. **Phys.Rev.Lett.** 112 (2014) 112501. (seleccionada por el editor, apareció como Sinopsis en Physics)
- Coarse-grained potential analysis of neutron-proton and proton-proton scattering below the pion production threshold R. Navarro Pérez, J.E. Amaro, E. Ruiz Arriola. **Phys.Rev.C**88 (2013)064002. (seleccionada por el editor)
- Large-Nc Properties of the rho and f0(600) Mesons from Unitary Resonance Chiral Dynamics J. Nieves, A. Pich, E. Ruiz Arriola. **Phys.Rev.** D84 (2011) 096002.
- Couplings in coupled channels versus wave functions: application to the X(3872) resonance D. Gamermann, J. Nieves, E. Oset, E. Ruiz Arriola. **Phys.Rev.** D81 (2010) 014029.
- The Polyakov loop and the hadron resonance gas model E. Megias, E. Ruiz Arriola, L.L. Salcedo. **Phys.Rev.Lett.** 109 (2012) 151601.
- Generalized parton distributions of the pion in chiral quark models and their QCD evolution W. Broniowski, E. Ruiz Arriola, K. Golec-Biernat. **Phys.Rev.** D77 (2008) 034023.
- Renormalization of chiral two-pion exchange NN interactions. momentum versus coordinate space. D.R. Entem, E. Ruiz Arriola, M. Pavon Valderrama, R. Machleidt. **Phys.Rev.C**77(2008)044006.
- Low energy universality and scaling of Van der Waals forces. A. Calle Cordon, E. Ruiz Arriola. **Phys.Rev.** A81(2010)044701.
- Precise Determination of Charge Dependent Pion-Nucleon-Nucleon Coupling Constants R. Navarro Perez, J.E. Amaro, E. Ruiz Arriola. **Phys. Rev.** C95 (2017) no.6, 064001.



10. Axial-vector dominance predictions in quasielastic neutrino-nucleus scattering
J.E.Amaro, E. Ruiz Arriola. **Phys.Rev. D93** (2016) no.5, 053002.

C.2. Proyectos (Indique los proyectos más destacados en los que ha participado (máximo 5-7). Elimine, si es el caso, aquellos que no considere relevantes)

FIS2017-85053-C2-1-P “FISICA HADRONICA, NUCLEAR Y ASTROPARTICULAS”

Proyecto de investigación del MINECO.

IP: Enrique Ruiz Arriola (Universidad de Granada)

Fecha de inicio y de finalización: del 1-1-2018 al 31-12-2020.

Tipo de participación: Investigador principal, Cuantía de la subvención: 84.700 euros

FIS2014-59386P Dinámica de sistemas hadrónicos en física nuclear a energías intermedias,
Proyecto de investigación del MINECO.

IP: Enrique Ruiz Arriola (Universidad de Granada)

Fecha de inicio y de finalización: del 1-1-2014 al 31-12-2017.

Tipo de participación: Investigador principal, Cuantía de la subvención: 70000 euros.

FIS2011-24149 Dinámica de sistemas hadrónicos en física nuclear a energías intermedias,
Proyecto de investigación del MINECO.

IP: Enrique Ruiz Arriola (Universidad de Granada)

Fecha de inicio y de finalización: del 1-1-2012 al 31-12-2014.

Tipo de participación: Investigador principal, Cuantía de la subvención: 108000 euros.

DGICYT-FIS2009-13364-C02-01 Dinámica de sistemas hadrónicos en física nuclear a
energías intermedias, Proyecto de investigación del MICCIN.

IP: Enrique Ruiz Arriola (Universidad de Granada)

Fecha de inicio y de finalización: del 1-1-2009 al 31-12-2013.

Tipo de participación: Investigador principal, Cuantía de la subvención: 96800 euros.

CPAN (Centro Nacional de Física de Partículas, Astropartículas y Nuclear).

IP: A.Pich (IFIC. Universidad de Valencia) Proyecto Consolider del MEC, 2008-2014. Tipo

de participación: Investigador. Entidades Participantes: Universidades Españolas

Duración: 2008-2014. Número de investigadores participantes : unos 250. Cuantía de la

Subvención: 10.000.000 euros.

C.3. Contratos, méritos tecnológicos o de transferencia (Indique los contratos más relevantes en los que ha participado, así como los méritos tecnológicos o de transferencia)

C.4. Patentes

Mediante una numeración secuencial (C.5, C.6, C.7...), incluya los apartados que considere necesarios para recoger sus principales méritos científicos-técnicos)

C.5. Tesis Doctorales Dirigidas en la UGR: (incluyendo trayectoria postdoctoral)

- Título: Desarrollos semiclásicos en Física Nuclear Relativista (co-dirigida con L. L. Salcedo). Doctorando: **Jose Caro Ramon**, Universidad: Granada, Facultad/Escuela: C. Física. Fecha: 1996. (Postdoc en Munich 1997-98. Actualmente Jefe de División de Sistemas Avanzados. Sistemas Globales de Navegación por Satélite (GMV) 1999-2014
- Título: La Interacción Nucleon-Nucleon en Teorías Efectivas. Doctorando: **Manuel Pavon Valderrama**, Universidad: Granada. Facultad/Escuela: C. Físicas Fecha: 2006 (Postdocs en Cracovia 2006, Juelich 2007-09, Valencia 2010-11, Paris-2012-14, Talent fellow, Peking 2016-2020.
- Título: Efectos de Temperatura Finita y Curvatura en QCD y Modelos de Quarks Quirales (co-dirigida L. L. Salcedo) Doctorando: **Eugenio Megías Fernandez**, Universidad: Granada. Facultad/Escuela: C. Físicas. Fecha: 2006 (Postdocs: Brookhaven 2007-08, Heidelberg 2009-10, Madrid 2011, Barcelona 2012-14, Munich 2015-16, Bilbao 2016-17, RyC en Granada 2018-22.



- Título: Renormalization of One-Boson-Exchange Interactions in the two-Nucleon system. Doctorando: **Alvaro Calle Cordon**, Universidad: Granada. Fecha: 18 Noviembre 2010 (Postdocs en JLAB 2011-2013, Murcia 2014).
- Título: Error analysis of the Nuclear Force (co-dirigida con el Prof. J. E. Amaro Soriano). Doctorando: **Rodrigo Navarro Pérez**, Universidad: Granada. Fecha: 25 Febrero 2015 (Postdocs en LNL (Livermore) 2015-17, Athens, Ohio, 2017-)2018, San Diego(2019-).

Trabajos dirigidos en la Ruhr-Universität (Bochum, Alemania)

Fuí tutor científico (betreuer) en el Institut für Theoretische Physik II, Ruhr-Universität Bochum (Alemania) de los trabajos

- Diplomarbeit (tesina) Baryonzahl und Windungszahl im selbstkonsistenten Nambu–Jona–Lasinio Modell realizada por **Dagmar Berg** en Octubre 1990
- Diplomarbeit (tesina) Einführung des omega - Mesons in das Nambu–Jona–Lasinio Modell realizada por **Cornelia Schüren** en Marzo de 1991.
- Doktorarbeit (tesis) Das Soliton eines effektiven Modells der QCD mit Vektormesonen. Realizada por Cornelia Schuren en Julio de 1994.
- Doktorarbeit (tesis) Vectorial couplings in the Nambu–Jona–Lasinio model: vacuum, meson and baryon properties defendida por **Frank Döring** en Julio de 1994.

Dirección de Trabajos tipo Tesina o fin de Master en la UGR

1. Desarrollo en derivadas de acciones efectivas a un loop y aplicaciones. (Codirigido con L.L. Salcedo) . **Jose Caro Ramón** en Noviembre de 1995.
2. Restauración de Invariancia Relativista en Solitones en 1+1 dimensiones en Teoría Cuántica de Campos. **Jorge Martín Sierra**. Granada, Diciembre 2001.
3. Desarrollo del Heat Kernel a Temperatura Finita. Acción Efectiva de QCD y Modelos Quark Quirales. (Codirigido por L.L. Salcedo). **Eugenio Megías Fernández**. Granada, Septiembre de 2003.
4. Regularización de la Dispersión Nucleon-Nucleon mediante una Condición de Contorno. **Manuel Pavón Valderrama**. Granada, Septiembre 2003.
5. Renormalización de Interacciones Atómicas mediante Condiciones de Contorno. **Alvaro Calle Córdón**. Granada, Diciembre 2007.
6. Solución al problema de Campos Hiper críticos mediante condiciones de frontera. **Rodrigo Navarro Pérez**. Granada, Julio 2010.
7. Interacción neutrón protón en ondas S con potencial óptico granulado hasta 3GeV **Pedro Fernández Soler**. Granada. Septiembre de 2014.
8. Partícula α : interacción y agregación en núcleos ligeros (Codirigido por J.E. Amaro) **Antonio Márquez Romero** . Granada. Septiembre 2015
9. Estudio de sistemas de quarks pesados. **Amador García Lorenzo**. Granada. Septiembre 2020.

C.6 Divulgación científica

Soy autor del libro **La Materia extrema**, RBA , 2016 , 180 pag. ISBN: 978-84-473-8567-6
Depósito legal: B-13302-2016 perteneciente a la colección “**Un paseo por el Cosmos**” .
Existen traducciones italiana **Una passeggiata nel cosmo** (RBA) y francesa “**Un voyage dans le cosmos**” (Le monde) , y se ha publicado en España, Italia, Francia, Chile y Argentina)

Parte A. DATOS PERSONALES

Fecha del CVA	4/06/2020
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Nombre y apellidos	María Carmen García Recio		
DNI/NIE/pasaporte		Edad	
Núm. identificación del investigador	Researcher ID	A-7328-2008	
	Código Orcid	https://orcid.org/0000-0002-0442-3700	

A.1. Situación profesional actual

Organismo	Universidad de Granada		
Dpto./Centro	Física Atómica, Molecular y Nuclear		
Dirección	Campus Fuentenueva, Granada E-18071		
Teléfono	correo electrónico	g_recio@ugr.es	
Categoría profesional	Catedrática de Universidad	Fecha inicio	4/10/2009
Espec. cód. UNESCO	2207, 2212		
Palabras clave	Física hadrónica, simetrías, muchos cuerpos, QCD		

A.2. Formación académica (título, institución, fecha)

Licenciatura/Grado/Doctorado	Universidad	Año
Licenciado en Ciencias Físicas	Universidad de Salamanca	1982
Tesina	Universidad de Salamanca	1982
Doctora en Ciencias Físicas	Universidad de Valladolid	1986

A.3. Indicadores generales de calidad de la producción científica

6 sexenios de investigación, el último concedido de 2013-2018

0 tesis doctoral dirigida en los últimos 10 años

2168 citas en Web of Science

116.2 promedio citas/año durante 2015-2019

45 o más publicaciones Q1

26 índice h en Web of Science en Junio, 2020

Parte B. RESUMEN LIBRE DEL CURRÍCULUM

Líneas de investigación: (se indica entre paréntesis el número de artículos sobre cada tema publicados en revistas con referee)

*** Temas de investigación:**

física hadrónica,
simetría quiral, de espín-sabor y he quarks pesados,
resonancias hadrónicas: bariónicas y mesónicas,
átomos exóticos: piónicos, kaónicos, encantados,
física nuclear a energías intermedias,
sistema hadrón-núcleo,
teoría de muchos cuerpos,
violación de CP.

Simetrías de quarks pesados.

* Número de publicaciones ISI = 68 (67 artículos + 1 libro)

* Revistas donde he publicado más artículos:

-Physical Review D (14) Q1

-Physical Review C (9) Q1

-Physics Letters B (8) Q1

-Journal of High Energy Physics (2) Q1

-Nuclear Physics A (20) Q1 y Q2 según año

* Publicaciones con relevancia especial:

- Phys.Lett.B582:49-54,2004 (155 citas ISI-WoK)

- Phys.Rev.D67 :076009,2003 (147 citas ISI-WoK)

* 2168 citas a mis artículos hasta 5 Junio 2020 (ISI Web of Knowledge):

* 16 artículos con más de 50 citas en ISI-WoK

(5 de ellos con más de 100 citas en ISI-WoK)

* índice h = 26 (Isi Web of Knowledge)

* Número de citas promedio por publicación ISI = 27.1

* Participado en 28 proyectos de investigación financiados con fondos públicos.

* Investigador Principal de 8 proyectos anuales de investigación financiados con fondos públicos.

* Estancia posdoctoral de 27 meses seguidos en el Massachusetts Institute for Technology, EE.UU.

* Estancias en centros extranjeros y españoles superiores a 1 semana: 22

* Co-organizador de 7 congresos internacionales

* Editora de Actas de Congresos: 2

* Árbitro (referee) de artículos en las revistas internacionales "Physical Review Letters",

"Physical Review D", "European Physical Journal A", "Journal of Physics G:

Nuclear and Particle Physics" y "European Journal of Physics"

6 tramos docentes.

Parte C. MÉRITOS MÁS RELEVANTES

C.1. Publicaciones

1. C. Garcia-Recio, L.L. Salcedo,
Renormalization of vector fields with mass-like coupling in curved spacetime,
EUROPEAN PHYSICAL JOURNAL C Volumen: 79 Número: 5 Número de
artículo: 438 Fecha de publicación: MAY 23 2019
2. .J. Yamagata-Sekihara, C. Garcia-Recio, J. Nieves, L.L. Salcedo, L. Tolós ,
Formation spectra of charmed meson-nucleus systems using an antiproton beam,
Physics Letters B 754 (2016) 26-32.

3. C. Garcia-Recio, C. Hidalgo-Duque, J. Nieves, L.L. Salcedo, L. Tolos.,
“*Compositeness of the strange, charm, and beauty odd parity Lambda states*”.
Phys. Rev. D 92 (2015) 034011, 1-14
4. C. Garcia-Recio and L. L. Salcedo.
“*Leptonic CP violating effective action for Dirac and Majorana neutrinos*”,
JHEP 08 (2014) 156, 1-48
5. C. García-Recio, J. Nieves, O. Romanets, L.L. Salcedo, L. Tolós,
“*Hidden charm N and Delta resonances with heavy-quark symmetry*”,
Phys. Rev. D87 (2013) 074034, 1-23.5.
6. C. Garcia-Recio, J. Nieves, O. Romantes, L.L. Salcedo and L. Tolos.
“*Odd parity bottom-flavored baryon resonances*”
Phys. Rev. D 87 (2013) 034032, 1-9
7. O. Romanets, L. Tolós, C. García-Recio, J. Nieves, L.L. Salcedo, R.G.E.
Timmermans,
“*Charmed and strange baryon resonances with heavy-quark spin symmetry*”,
Phys. Rev. D85 (2012) 114032, 1-30.
8. Gamermann, D.; Garcia-Recio, C.; Nieves, J; Salcedo, LL
“*Odd-parity light baryon resonances*”
Phys. Rev. D84 (2011) 056017, 1-29
9. D. Gamermann, C. García-Recio, J. Nieves, L.L. Salcedo, L. Tolós,
“*Exotic dynamically generated baryons with negative charm quantum number*”,
Phys. Rev. D81 (2010) 094016, 1-11.
10. C. García-Recio, L. L. Salcedo,
“*CP violation in the effective action of the Standard Model*”,
JHEP 07 (2009) 015, 1-32.

C.2. Proyectos

1. **FIS2017-85053-C2-1-P**, *Física hadrónica, nuclear y astropartículas*, Ministerio de Economía y Competitividad, Proyectos de I+D (2017)
IP: Enrique Ruiz Arriola (Universidad de Granada)
Duración: 01/01/2018-31/12/2020, Cuantía: 84.700,00€, Participación: Investigador
2. **FIS2014-59386-P**, *Física hadrónica y nuclear*, Ministerio de Economía y Competitividad, Proyectos de I+D (2014)
IPs: Enrique Ruiz Arriola, José Enrique Amaro Soriano (Universidad de Granada)
Duración: 01/01/2015-31/12/2017, Cuantía: 84.700,00€, Participación: Investigador
3. **FIS2011-24149**, *Dinámica de sistemas hadrónicos en física nuclear a energías intermedias*, Ministerio de Ciencia e Innovación, Plan Nacional I+D (2011)
IP: Enrique Ruiz Arriola (Universidad de Granada)
Duración: 01/01/2012-31/12/2014, Cuantía: 108.900,00€, Participación: Investigador
4. **FIS2008-01143**, *Dinámica de sistemas hadrónicos en física nuclear a energías intermedias*, Ministerio de Educación y Ciencia, Plan Nacional I+D (2008)
IP: Enrique Ruiz Arriola (Universidad de Granada)
Duración: 01/01/2009-31/12/2011, Cuantía: 96.800,00€, Participación: Investigador

5. **FQM225**, *Física nuclear a energías intermedias*, Junta de Andalucía, Grupos Universitarios de investigación y Desarrollo Tecnológico de Andalucía (2003-2018)
IP: José Enrique Amaro Soriano (Universidad de Granada)
Duración: renovado anualmente desde 2003, Cuantía: promedia 9.000€ anuales,
Participación: Investigador

C.3. Contratos

C.4. Patentes

C.5. Otros trabajos de investigación (últimos 10 años)

Título: Estudio de resonancias hadrónicas con belleza
Tipo: Trabajo de fin de máster Física
Universidad de Granada, Junio 2015
Alumno: Luis Miguel García Martín, Calificación: Sobresaliente

C.6. Organización de actividades (últimos 10 años)

1. . Título: *Quantum Information in Spain (ICE-6)*
Tipo de actividad: Co-organizador, Ámbito: Internacional
Lugar: Granada, Fecha: (previsto Mayo 2020) pospuesto por COVID19 a 25-28 May 2021
2. Título: *International workshop on chiral symmetry in hadrons and nuclei (Chiral10)*
Tipo de actividad: Co-organizador, Ámbito: Internacional
Lugar: Valencia, Fecha: 21-24 junio 2010

C.7 Participación en tareas de evaluación.

Miembro del panel de expertos externos del Programa ACADEMIA de la ANECA desde 2009 hasta 2017

Jaume Carbonell



1

March 26, 2021

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¹Starting from january 1st, 2020, the Institut des Sciences Nucléaires d’Orsay becomes part of the Laboratoire de Physique des 2 Infinis Irène Joliot-Curie, (IJCLab), regrouping most of the laboratories related to Nuclear and Particle Physics of the Orsay Campus. For simplicity, this change is not included in the present document

1 Curriculum vitae

1.1 Personal Data

- **Name:** Jaume Carbonell
- **Date and Place of Birth:**
- **Nationality:** French
- **Home address:**

- **Work address:** Institut de Physique Physique Nucléaire
15. rue George Clémenceau, 91406 Orsay Cedex, France
Tel.+33 169 15 79 26
- **e-mail address:** carbonell@ipno.in2p3.fr

1.2 Academic Career

- **1983:** PhD on Theoretical Nuclear Physics at Institut des Sciences Nucléaires de Grenoble
- **1983:** Permanent position at CNRS (Centre National de la Recherche Scientifique)
- **1999:** Habilitation à Diriger des Recherches (DHDR) Université Joseph Fourier Grenoble
- **2002:** Directeur de Recherches DR2 at CNRS
- **2004-2011:** Head of Theory Group, Laboratoire de Physique Subatomique de Grenoble²
- **2004-2012:** Director of Groupement de Recherches (GDR) devoted to "Lattice calculations in Subatomic Physics"
- **2004-2008:** President of "Comité de Financement des projets théorie" à l'IN2P3³
- **2009:** Directeur de Recherches DR1 au CNRS
- **2011-2012:** Detached to CEA Saclay (SPhN)
- **2012:** Affected at the Institut de Physique Nucléaire d'Orsay
- **2010-2013** Prime d'Excellence Scientifique CNRS "for your exceptional contribution to scientific research"
- **2019:** Since November 2019 Directeur de Recherches Emérite at CNRS

²Former Institut des Sciences Nucléaires

³Institut National de Physique Nucléaire et Physique des Particules from CNRS

1.3 Teaching Activities

My CNRS position is a fully devoted research position without any teaching duty. However, I have displayed, with pleasure and intellectual benefit, some **graduate teaching activities** at the Grenoble Université Joseph Fourier during the period (1983-2012) as well as some **PhD and Postdoctoral Lectures** in different Institutions. Among the last ones:

- Ecole Joliot Curie, Frejus (France), sept. 2013
"Introduction au calcul sur réseau en Physique Subatomique" (3x1h30)
- Lectures given at ITA Sao Jose dos Campos, Brésil, oct. 2013
"Introduction to Lattice QCD" (2x1h30)
- Lectures at Galileo Galilei Institute for Theoretical Physics, 16-20 March 2015, Firenze
Introduction to Lattice QCD and applications to nuclear and hadronic physics (4 x 1h)
- Lectures on Antiproton-Proton Interaction, SPhN Saclay, 15 June 2017 (5h)
- XIV Hadron Physics School, Florianapolis (Brasil), March 2018
Nuclear physics and its relation with lattice QCD (5x1h)
- Lectures at University of Kyushu (Japan), Novembre 2018
The Few-Nucleon System : from Yukawa to LQCD (15 h)

Aside from this "regular lectures" I've been quite often invited to give **seminars** in other laboratories in France and abroad. This account for **more than 80 seminars since 2002**.

I have **supervised the following PhDs** on Few-Body Physics, Relativistic equations (Light-Front Dynamics) and Lattice-QCD :

1. Frédéric Ciesielski, Thèse U.J.F. Grenoble, defended in October 1997
Title: "Système à quatre corps: états liés et états de diffusion par la résolution des équations de Faddeev-Yakubowsky"
2. M. Mangin-Brinet, Thèse Université Paris VII, defended in May 2001
Title: Description relativiste des systèmes composites simples par la dynamique sur le front de lumière
3. R. Lazauskas, Thèse U.J.F. Grenoble, defended in October 2003
Title: Etude de la diffusion de particules lourdes sur des systèmes atomiques et nucléaires
<http://tel.ccsd.cnrs.fr/documents/archives0/00/00/41/78/>

4. D. Oropeza, Thèse U.J.F. Grenoble, defended in novembre 2004
Title: Etude des états liés et de diffusion par la théorie quantique des champs sur le cône de lumière (<http://tel.ccsd.cnrs.fr/documents/archives0/00/00/78/08/>)
5. Vincent Drach, defended in june 2010
Title: Dynamical twisted mass fermions and baryon spectroscopy
6. Pierre-Antoine Harraud, defended in october 2010
Title: Etude des facteurs de forme hadroniques en QCD sur réseau

I have had in charge about 50 Licence and Master students for **introductory stages of initiation to research** in theoretical physics and had welcome a certain number of **Post-doctoral visitors** (M. Yamashita, Z. Liu, M. Papinuto, E. Ydrefors).

1.4 Organisation and Management of Research activities

During my career I have been involved in many tasks related to **Organisation et Management of Research**. Among them:

- Responsable of the Groupe de Physique Théorique du LPSC⁴ Grenoble (2004-2011)
- Membre of Conseil d'Unité et du Conseil Scientifique du LPSC (2001-2011)
- Responsable du GDR "Calculs sur Réseau en Physique Subatomique" (UMR2921) (2005-2012)
- PI of ETMC France for computing resources at GENCI (2004-2011)
- Member, Vice-president and President of the "Bureau National des Théoriciens Nucléaires français" (2002-2006)
- Member of the Conseil Scientifique de l'ORAP (Promotion of HPC)
- Organisation of Colloques IRFU (2011-2013)
- Editor of "Few-Body Systems" (Editor Field: Nuclear Physics) since 2010
- Member of Conseil Scientifique du ESNT (<http://esnt.cea.fr/>) since october 2016

I have also been requested by several countries to participate in **Expertise Works** related to funding agencies, for instance:

⁴Laboratoire de Physique Subatomique et Cosmologie de Grenoble

- Member of Comite technique du GENCI (National Supercomputers Organisation at IDRIS, CINES and CCRT)
- Referee Phys. Rev, Phys. Lett., Nucl. Phys., Journal of Physics, European Physical Journal, Few-Body Systems
- Expert at: NSF (USA), Portugal Funding Agency, INRA Nantes, Austrian Science Funding Agency , FNRS Belge, Croatian Science Foundation, Deutsche Forschungsgemeinschaft (DFG) Allemagne, INFN Italy, COFECUB (Brasil), ANR France, AERES France (2006-2007), FAPESP Brasil

I have been actively involved in the **Organisation of International Conferences and Workshops**

- Chairman (co) of the XVI European-Few-Body Conference, Autrans (France), 1998
- Organisation of "Critical stability in Few-Body Systems" Workshop, Trento, sept. 2003
- Organisation of the Workshop on "(e,e') reactions", LPSC Grenoble, oct. 2003
- Organisation of HADRONS 2004 at Ecole Polytechnique (Palaiseau), oct 2004
- Lattice QCD Present and Future, LAL Orsay, 2004
- Organisation of Workshop FUSTIPEN at SPhN Saclay (mai 2012)
- Organisation of the Workshop "Computation of three- and four-neutron resonances", ESNT Saclay, october 2015
- Organisation of Workshop "Dynamics of highly unstable exotic light nuclei and few-body systems", ESNT Saclay, january 2017
- Chairman (co) of the Worldwide IUPAP XXII Few-Body Conference, Caen juillet 2018
- Organisation of ECT* Workshop "Antiproton-nucleus interactions and related phenomena", Trento, july 2019
- Organisation of Light-Cone Meeting, at Ecole Polytechnique (Palaiseau), septembre 2019.
- Organisation of the Workshop "Nuclear physics with antiprotons: a theory endeavor", ESNT Saclay, july 2020

and I am recurrently member of the **International Advisory Committee** of Conferences and Workshops. During the last years :

- Worldwide Few-Body 17, Duke Univ. (Durham, USA), jun 2003
- XX European-Few-Body Conference, Groningen (Netherlands), 2004

- XXI European-Few-Body Conference, Salamanca (Espagne), sept. 2010
- Worldwide FB20 Few-Body Conference, Fukuoka (Japon) août 2012
- XXII European-Few-Body Conference, Cracow (Poland), sept. 2013
- Worldwide FB21 Chicago (USA), mai 2015
- European FB23 Aarhus (Denmark), août 2016
- International Baldin Seminar on H.E.P., JNR Dubna 19-24 sept 2016
- International Baldin Seminar on H.E.P., JNR Dubna, sept 2018
- European FB24 Surrey (Angleterre), septembre 2019

Since the beginning of my career I am at the origin of many **International Scientific Collaborations** like:

- Responsable of the Agreement CNRS- University College London (1988-1990)
- Responsable of the Collaboration CNRS - Academy of Sciences URSS (1988-1994)
- Membre of the European Collaboration on Lattice QCD (ETMC) and responsible for the baryon sector (2004-2011)
- Responsable collaboration CNRS (EGIDE/ZENON) avec Univ. Chypre (2009-12)
- Responsable collaboration IN2P3-MEC Espagne avec Univ. de Sevilla (2009-11)
- Responsable collaboration PICS Russian Academy of Sciences (2012-2013), avec LPC Clermont et Institut Lebedev
- Collaboration PICS with CNRS-Belgique (2012-2013), avec le IPHC de Strasbourg
- Responsable of the CNRS-FAPESP agreement with Brasil (2014-2015)
- Promotor of the French-Japanese Workshops: alternatively in Japan (RIKEN/Tokyo, Tohoku Univ. Sendai, Kyushu Univ.,...) and France (Saclay, Jussieu,...), started in 2013
- PI for the PICS with le Brésil 2015-2018
- PI for the PICS with Institut Lebedev (Moscou) 2016-2018
- Organisation and Direction of the Laboratoire International Associé (L.I.A.) France-Brasil, started in january 2018
- International Collaboration agreement with Poland (COPIN) on antiproton physics

1.5 Scientific Activity

I have worked in several fields of theoretical physics: Classical Chaos in Nuclei, Molecular, Atomic, Nuclear (few-nucleon problem, nuclear reactions), Hadronic (Quark model, Antiprotons) and Particle Physics (Lattice QCD) as well as in some theoretical aspects of Quantum Mechanics, Few-Body Physics (Faddeev-Yakubowski equations) and relativistic equations (Light-Front Dynamics, Bethe-Salpeter).

Below is a short summary of my works – sorted by topics – including a selected list of relevant reference on each of these different fields:

- **Chaos in nuclei:** I was the first to explore during my PhD [1] the (classical) chaotic motion of a nucleon in the averaged nuclear potential and identify the regions of "chaoticity" inserted between three integrable limiting cases [2-5].
 1. Trajectoires classiques dans un potentiel nucléaire moyen
J. Carbonell, Thèse Université de Grenoble (1983)
 2. Classical properties and semi-classical calculations in a spherical nuclear average potential
J. Carbonell, F. Brut, R. Arvieu, J. Touchard, Journal de Physique, C6 (1984) 351-360
 3. The approach of chaos in deformed nuclei
J. Carbonell, F. Brut, R. Arvieu, J. Touchard, Journal de Physique, C6 (1984) 371-378
 4. Classical properties and semi-classical quantization of a spherical nuclear potential
J. Carbonell, F. Brut, R. Arvieu, J. Touchard, J. Phys. G 11 (1985) 325
 5. Phase space organization in prolate and oblate potentials
J. Carbonell, F. Brut, R. Arvieu, J. Touchard, Phys. Rev. A35 (1987) 2389
- **Non relativistic Quark Model:** My work was essentially limited to study the NN interaction in terms of 6 interacting quarks [1] and to infirm the stability of the Jaffe's H particle when the SU(3) flavour symmetry is broken as it is the case in Nature [2].
 1. B. Silvestre-Brac, J. Carbonell, C. Gignoux
Radial excitations in nucleon-nucleon interaction
Phys. Lett. **B179** (1986)
 2. B. Silvestre-Brac, J. Carbonell, C. Gignoux
H particle stability in the non relativistic quark model
Phys. Rev. **D36** (1987) 2083
- **Antiproton Physics:** I made relevant contributions in modeling the protonium system [1], developing a coupled-channel model [2], studying analytic properties of Optical Models [3], computing matter-antimatter zero energy interaction [7]. My work on this field continue inside the PUMA project [8] and topics related to the $\bar{N}N$ interaction [9].
 1. Protonium annihilation in optical models
J. Carbonell, G. Ihle, J.M. Richard, Z. Phys. **A334** (1989) 329-341

2. The coupled-channels model for describing the low energy $N\bar{N}$ interaction
O. D. Dalkarov, J. Carbonell, K. V. Protasov, *Sov. J. Nucl. Phys.* **52**, 6 (1990) 1052-1059
 3. The origin of P-wave enhancement in optical model for low energy $p\bar{p}$ scattering
J. Carbonell, O.D. Dalkarov, K.V. Protasov, I.S. Shapiro, *Nucl. Phys.* **A535** (1991) 651
 4. Isospin mixing in protonium and annihilation dynamics
C. B. Dover, J. M. Richard, J. Carbonell, *Phys Rev.* **C44** (1991) 1281-1288
 5. On a possible nearthreshold $\Lambda\bar{\Lambda}$ state
J. Carbonell, K.V. Protasov, O.D. Dalkarov, *Phys. Letters* **B306** (1993) 407-410
 6. $p\bar{p}$ low energy parameters from annihilation cross section data
J. Carbonell, K.V. Protasov, A. Zenoni, *Phys. Lett.* **B397** (1997) 345
 7. A. Voronin, J. Carbonell
Antiproton-Hydrogen annihilation at subkelvin temperatures, *Phys. Rev.* **A57** (1998) 4335
 8. PUMA : antiProton Unstable Matter Annihilation
N. Nakatsuka, A. Obertelli, J. Carbonell, et al
Contribution to 7th International Conference on Trapped Charged Particles and Fundamental Physics 2018 (TCP 2018), Michigan, Sep. 30 to Oct. 5, 2018
 9. Low lying antiproton deuteron Coulomb states
R. Lazauskas, J. Carbonell, submitted for publication (2021)
- **Faddeev-Yakubosky equations:** The solution of the Faddeev-Yakubowsky equations in configuration space has been my central activity during my career. They aim to obtain exact solution (in the numerical sense) of the intrinsic A-body problem including bound states and all the scattering channels, including break-up.

Finding and developping analytical and numerical methods allowing the obtention of such solutions is an endless task that I've tried to make it progress during many years. In this field the progresses are however slow: I started my career with the first $A=3$ solutions and the first $A=5$ have just recently appeared.

In this section I will include only some formal developments and recent reviews describing the progress in this field. The interested reader can have a flavour of the formalism by looking into Ref. [8] where we tried to give in some detail the steps and difficulties when evolving from $A=3$ to $A=5$.

1. Faddeev calculations in configuration space with cartesian coordinates
J. Carbonell, C. Gignoux, S. P. Merkuriev, *Few-Body Systems*, **15** (1993) 15-23
2. Solving Faddeev equations in the interaction domain
J. Carbonell, C. Gignoux, *Few-Body Systems*, Suppl. **7** (1994) 270-273
3. Solutions of the Faddeev-Yakubovsky equations for the four nucleon scattering problem
F. Ciesielski, J. Carbonell, *Phys. Rev.* **C58** (1998) 58-74

4. Some applications of the Faddeev-Yakubovsky equations to the cold-atoms physics
Jaume Carbonell, Arnoldas Deltuva, Rimantas Lazauskas
Comptes Rendus de l'Académie des Sciences, C. R. Physique 12 (2011) 4758
5. Application of complex-scaling method for few-body scattering
Rimantas Lazauskas, Jaume Carbonell, Phys. Rev C84,(2011) 034002, arXiv:1104.2016
6. Complex scaling method for three and four body scattering states above the break-up threshold
Rimantas Lazauskas, Jaume Carbonell, Few-Body Systems 54 (2013) 967-972
7. Bound state techniques to solve the multiparticle scattering problem
J. Carbonell, A. Deltuva, A. C. S. Fonseca, R. Lazauskas
Progress in Particle and Nuclear Physics 74 (2014) 55-80
8. The Faddeev-Yakubovsky symphony
R. Lazauskas, J. Carbonell, Few Body Syst. 60 (2019) no.4, pag. 62
Special Issue in memory of L.D. Faddeev (19-2017)
9. Description of four- and five-nucleon systems by solving Faddeev-Yakubovsky equations in configuration space
Rimantas Lazauskas and Jaume Carbonell, Frontiers in Physics 7:251 (2020);
doi:10.3389/fphy.2019.00251
10. **Recent Progress in Few-Body Physics**
Proceedings of the 22nd International Conference on Few-Body Problems in Physics, Caen 2018
Ed. by N. Orr, M. Ploszajczak, M. Marques, J. Carbonell
Springer Proceedings in Physics, 238 (2020), doi.org/10.1007/978-3-030-32357-8

- **Nuclear reaction with light nuclei:** Most of these works are application to nuclear physics of the Faddeev-Yakubowsky equations in configuration space described in previous section. I started solving for $A=3$, latter on $A=4$ and finally $A=5$ which is the present state of the art. This formalism allows obtaining exact solutions (in the numerical sense) of the Schrodinger equation for $A>2$. The only input is the two- or three-body interaction. It is in this sense that they are also called *ab initio*, although the degrees of freedom involved can be far from elementary, as it is the case of the Nucleon.

After some works in $A=3$, I was the first to obtain the scattering solutions for $A=4$ and **put in evidence some failures of the NN interaction** [4] when describing the first resonance in Nuclear Physics: the n - ^3H P-wave resonant states.

Interesting application where those related to the study of three- and four-neutron resonant states [5,6,8,9]. By directly computing the complex energy of the resonances (defined as an S-matrix pole) we infirm the GANIL (2002) and RIKEN (2016) experimental findings, claiming for a $4n$ bound and resonant state respectively.

It is also worth mentioning our last work [10] where we performed the **first *ab initio* calculation of the ^4H and ^5H resonance parameters.**

1. Solutions of Faddeev-Yakubovsky equations for the four nucleon scattering problem
F. Ciesielski, J. Carbonell, Phys. Rev. **C58** (1998) 58-74
2. Low energy n+t scattering and the NN forces
F. Ciesielski, J. Carbonell, C. Gignoux, Phys. Lett. **B447** (1999) 199
3. Testing Non-local Nucleon-Nucleon Interactions in the Four-Nucleon Systems
R. Lazauskas, J. Carbonell, Phys. Rev C70 (2004) 044002; nucl-th/04080
4. Low energy n-³H scattering: a cornerstone for nucleon-nucleon potentials
R. Lazauskas, J. Carbonell, A.C. Fonseca, M. Viviani, A. Kievsky, S. Rosati,
Phys. Rev. C71 (2005) 034004
5. Three-neutron resonance trajectories for realistic interaction models
R. Lazauskas, J. Carbonell, Phys. Rev. C71 (2005) 044004; nucl-th/0502037
6. Is a tetra-neutron resonance compatible with realistic nuclear interactions ?
R. Lazauskas, J. Carbonell, Phys. Rev. C 72 (2005) 034003; nucl-th/0507022
7. Indication of SBCS-BEC crossover behavior in halo nuclei
K. Hagino, H. Sagawa, J. Carbonell, P. Schuck, Phys. Rev. Lett. 99 (2007) 022506
8. On the possibility of generating a 4-neutron resonance with T=3/2 3-neutron force
E. Hiyama, R. Lazauskas, J. Carbonell and M. Kamimura, Phys. Rev. C93 (2016) 044004
9. Modeling the double charge exchange response function for a tetra-neutron system
R. Lazauskas, E. Hiyama, J. Carbonell, Prog. Theor. Exp. Phys. 2017, 7, 073D03
10. Ab initio calculations of ⁵H resonant states
R. Lazauskas, E. Hiyama, J. Carbonell, Phys. Lett. B791 (2019) 335
11. **The quest for light multineutron systems**
F. Miguel Marquès and Jaume Carbonell, Eur. Phys. Journal A (2021) 57:105

- **Molecular and atomic physics** : I've studied several three- and four-body problems in atomic physics using the Faddeev-Yakubovsky formalism, properly modified to account for long range Coulomb interactions. In particular de scattering of three charged particles like e+Ps [1] or e+H [2].

I've also made pioneering calculations in describing trimer and tetramers ⁴He atomic states bound by Wan der Waals like forces [3].

In this field I would like to put forward the **discovery of a new bound state of H₂⁺ molecular ion**. It has an extremely small binding energy B=1.14 10⁻⁹ a.u. – the weakest bound ever predicted in a natural system – and the corresponding p-H scattering length is as big as $a_t = 750 \pm 5$ a.u. This was first announced at Les Houches Workshop on Critical Stability [4] by performing a pole extrapolation of a low energy phase shifts analysis and confirmed by direct bound state calculation in [5,6].

A brief review of our results can be found in [7]

1. Faddeev calculations of e-Ps Scattering Lengths
A. A. Kvitsinsky, J. Carbonell, C. Gignoux, Phys Rev. **A46** (1992) 1310-15
2. S-wave positron-hydrogen scattering via Faddeev equations.
A. A. Kvitsinsky, J. Carbonell, C. Gignoux, Phys. Rev. **A51** (1995) 2997-3004
3. Description of ^4He tetramer bound and scattering states
R. Lazauskas, J. Carbonell, Phys. Rev. **A73** (2006) 062717; physics/0609153
4. Interaction of Heavy Charged Particles with Atomic Hydrogen
R. Lazauskas, J. Carbonell, Few-Body Systems Suppl. **14** (2003) 167
5. A new state of the H_2^+ molecular ion
J. Carbonell, R. Lazauskas, D. Delande, L. Hilico, S. Kilic, Europhys. Lett. **64** (2003) pag. 316; physics/0207007
6. J. Carbonell, R. Lazauskas, V.I. Korobov
Relativistic and QED corrections to the $2p\sigma_u(v=1)$ vibrational state of the H_2^+ molecular ion, J. Phys. B: At. Mol. Opt. Phys. **37** (2004) 2997-3002; physics/0411031
7. Some applications of the Faddeev-Yakubovsky equations to the cold-atoms physics
J. Carbonell, A. Deltuva, R. Lazauskas, C.R. Physique (2010), doi:10.1016/j.crhy.2010.12.001

- **Relativistic equations:** This work was initially motivated by the experimental program at JLab where the deuteron was probed at momentum transfers of several GeV/c. Using the formalism of Light-Front Dynamics [1] we computed the corresponding deuteron relativistic wave functions [2,3], electromagnetic form factors [4] and polarisation observables (t_{20}) which turn to be in very good agreement with data, despite our description in terms of Nucleon and Mesons degrees of freedom.

A systematic study of the LFD solution for the two scalar and two fermion systems was performed in [5,6,7,8]

A second part of my work was, in relation with my activity in LQCD, was the study of the solutions of the Bethe-Salpeter equation in Minkowski space. We first proposed a method, based on the Nakanishi integral representation, to compute these solutions [9,10] and compute the corresponding electromagnetic form factors [11, 12] that cannot be obtained from the euclidean solution. Such possibility, extended soon to the fermion systems, open the way to a series of works in several countries, mainly Italy and Brasil. One of the interest is the relation between the euclidean and the Minkowski solutions [12-17]. A last topic, still in progress, on this subject was the study of the so called abnormal solutions of the Bethe-Salpeter equation [18].

1. Explicitly Covariant Light-Front Dynamics and Relativistic Few-Body Systems
J. Carbonell, B. Desplanques, V.A. Karmanov, J.F. Mathiot, Phys. Rep. **300** (1998) 215
2. Relativistic deuteron wave function in the light-front dynamics
J. Carbonell, V. A. Karmanov, Nucl. Phys. **A581** (1995) 625-653
3. Relativistic wave function of the np system in the $J^\pi = 0^+$ continuous spectrum state
J. Carbonell, V. Karmanov, Nucl. Phys. **A589**, (1995) 713-723

4. Deuteron electromagnetic form factors in the Light-Front Dynamics
J. Carbonell, V.A. Karmanov, Eur. Phys. J. A6 (1999) 9-19
5. Solutions of the Wick-Cutkosky model in the Light Front Dynamics
Mariane Mangin-Brinet, Jaume Carbonell, Phys. Lett. B474 (2000) 237 ; nucl-th/9912050
6. Stability of bound states in the light-front Yukawa model
M. Mangin-Brinet, J. Carbonell, V. Karmanov, Phys. Rev. D64 (2001) 027701
7. Relativistic bound states in Yukawa model
M. Mangin-Brinet, J. Carbonell, V. Karmanov, Phys. Rev. D64 (2001) 125005
8. Two-fermion relativistic bound states in Light-Front Dynamics
M. Mangin-Brinet, J. Carbonell, V. Karmanov, Phys. Rev. C68 (2003) 055203
9. Solving Bethe-Salpeter equation in Minkowski space
V.A. Karmanov, J. Carbonell, Eur. Phys. J. A 27, pp. 1-9 (2006); hep-th/0505261
10. Cross ladder effects in Bethe-Salpeter and Light-Front equations
J. Carbonell, V.A. Karmanov, Eur. Phys. J. A 27, pp. 11-21 (2006); hep-th/0505262
11. Electromagnetic form factor via Minkowski and Euclidean Bethe-Salpeter amplitudes
V. Karmanov, M. Mangin-Brinet, J. Carbonell, Few-Body Systems 44 (2008) 283
12. Solutions of the Bethe-Salpeter Equation in Minkowski Space and applications to electromagnetic form factors
J. Carbonell and V.A. Karmanov, Few Body Syst. 49, 205-222, (2011)
13. Solving Bethe-Salpeter scattering state equation in Minkowski space
J. Carbonell and V.A. Karmanov, Phys. Rev. D 90, 056002 (2014)
14. Bethe-Salpeter scattering amplitude in Minkowski space
J. Carbonell and V.A. Karmanov, Phys. Lett. B727 (2013) 319-324; hep-ph: 1310.4091
15. Zero energy scattering calculation in Euclidean space
J. Carbonell and V.A. Karmanov, Phys. Lett. B754 (2016) 270
16. Transition electromagnetic form factor and current conservation in the Bethe-Salpeter approach
J. Carbonell and V.A. Karmanov, Phys. Rev. D 91, 076010 (2015)
17. Euclidean to Minkowski Bethe-Salpeter amplitude and observables
J. Carbonell, T. Frederico, V. A. Karmanov, Eur. Phys. J. C (2017) 77: 58.
18. Bound state equation for the Nakanishi weight function
J. Carbonell, T. Frederico, V. A. Karmanov, Physics Letters B 769 (2017) 418423
19. Bound states of relativistic nature
V.A. Karmanov, J. Carbonell and H. Sazdjian
Proc. Int. Conference Nuclear Theory in the Supercomputing Era (NTSE-2018)
Daejeon, South Korea, October 29, November 2, 2018,
Eds. A. M. Shirokov and A. I. Mazur. Pacific National University, Khabarovsk, Russia,
2019, p. 1. <http://www.ntse.khb.ru/2018/Proc/Karmanov-NTSE-proc.pdf>.

20. **Structure and EM form factors of purely relativistic systems**

V.A. Karmanov, J. Carbonell, H. Sadzjian, PoS(LC2019) 050
Contribution to LCM2019, Ecole Polytechnique, Sept 2019

21. **Hybrid nature of the abnormal solutions of the Bethe-Salpeter equation in the Wick-Cutkosky model**

J. Carbonell, V.A. Karmanov, H. Sadzjian, Eur. Phys. J. C 81, 50 (2021) ; doi.org/10.1140/epjc/s10052-021-08850-1

- **LATTICE QCD:** I started doing lattice calculation with the aim to study the QFT contents of the "traditional" nuclear physics models, like Yukawa. The results are summarized in Refs. [1-4].

Then I move to standard LQCD joining the European Twisted Mass Collaboration (ETMC) where I was mainly interested in the Baryonic sector. Some representative references are in Refs. [5-12].

In my last work related to LQCD, Ref [13], I've considered the possibility to use the Bethe-Salpeter euclidean amplitudes computed in LQCD to obtain the scattering length without using the Luscher method.

1. Yukawa model on a lattice: two-body states

F. de Soto, J. Carbonell, C. Roiesnel, Ph. Boucaud, J.P. Leroy, O. Pene
Eur. Phys. J A31, 777 (2007); hep-lat/0610084

2. Two-body scattering length of Yukawa model on a lattice

F. de Soto, J. Carbonell, C. Roiesnel, Ph. Boucaud, J.P. Leroy, O. Pene
Nucl. Phys. A 790 (2007) 410 ; hep-lat/0610086

3. Nuclear models in the lattice

F. de Soto, J. Carbonell, C. Roiesnel, Ph. Boucaud, J.P. Leroy, O. Pene
Nuclear Physics B Proc. Suppl. 164 (2007) 252; hep-lat/0511009

4. The Nuclear Yukawa Model on a Lattice

F. de Soto, J.C. Anglès d'Auriac, J. Carbonell
Eur. Phys. J. A (2011) 47-57; arXiv:1104.1907

5. Light baryon masses with dynamical twisted mass fermions

C. Alexandrou, R. Baron, M. Brinet, J. Carbonell, V. Drach, P. Guichon et al.
Phys. Rev. D78, 014509 (2008) ; hep-latt/0803.3190

6. Low lying baryon spectrum with two dynamical twisted mass fermions

C. Alexandrou, R. Baron, J. Carbonell, V. Drach, P. Guichon, K. Jansen et al.
Phys. Rev. D80, 114503 (2009), hep-lat/0910.2419

7. Light hadrons from LQCD with light (u,d), strange and charm dynamical quarks

R. Baron, Ph. Boucaud, J. Carbonell et al , JHEP06 (2010) 11

8. Computing K and D meson masses with $N_f = 2 + 1 + 1$ twisted mass lattice QCD
R. Baron, Ph. Boucaud, J. Carbonell, V. Drach, F. Farchioni et al.
Computer Physics Communications 182 (2011), pp. 299-316,
 9. Axial Nucleon form factors from lattice QCD
C. Alexandrou, J. Carbonell, M. Constantinou, P. A. Harraud, P. Guichon et al.
Phys. Rev. D38, 045010 (2011)
 10. Nucleon electromagnetic form factors in twisted mass lattice QCD
C. Alexandrou, M. Brinet, J. Carbonell, M. Constantinou, P.A. Harraud, et al.
Phys. Rev. D83: 094502 (2011)
 11. Moments of nucleon generalized parton distributions from lattice QCD
C. Alexandrou, J. Carbonell, M. Constantinou, P. A. Harraud, P. Guichon et al.
Phys. Rev. D83, 114513 (2011)
 12. Strange and charm baryon masses with two flavors of dynamical twisted mass fermions
C. Alexandrou, J. Carbonell, D. Christaras, V. Drach, M. Gravina, M. Papinutto
Phys.Rev. D86 (2012) 11450
 13. Zero energy scattering calculation in Euclidean space
J. Carbonell and V.A. Karmanov, Phys. Lett. B754 (2016) 270
- **Others:** There is a series of works that is hard to include in the previous sections but that I nevertheless considered of some interest.
 1. Exact boundary conditions at finite distance for the time-dependent Schrodinger equation
M. Mangin-Brinet, J. Carbonell, C. Gignoux, Phys. Rev. **A57** (1998) 3245-3255
Were we formulate the exact boundary conditions for the space-time propagation of a wave packet in a finite spatial domain, thus avoiding the parasite reflexions present at any finite distance boundary
 2. Deuteron Analysing power in the Charge Exchange Reaction $\vec{d} + p \rightarrow (pp) + n$
J. Carbonell, M. Barbaro, C. Wilkin, Nucl. Phys. **A529** (1991) 653-674
This work was the basis of the construction of a deuteron polarimeter (POLDER) that was extensively used at SATURNE facility (Sacaly), JLab (US) and COSY (Juelich)
It is at the origin of several collaborations with the experimental groups
 3. Improving proton-induced one-nucleon removal in intranuclear cascade
D. Mancusi, A. Boudard, J. Carbonell, J. Cugnon, J.-Ch. David and S. Leray
Phys. Rev. C 91, 034602 (2015) ; <http://arxiv.org/abs/1411.4562>
One of my (rare) contributions in the field of many-body physics.
 4. Power Counting in Peripheral Partial Waves: The Singlet Channels
M. Pavón Valderrama, M. Sánchez Sánchez, C.-J. Yang, Bingwei Long, J. Carbonell, and U. van Kolck, Phys. Rev. C **95**, 054001 (2017)

In the two following references we did not attempt any exact solution of the nuclear problem but we have modelled in a simple and successful way the resonant ^{18}B virtual state as well as the heavier isotopes ^{19}B as a ^{17}B - n - n three-body system. This model, that can be extended to $^{20,21}\text{B}$, is based on the huge n - ^{17}B scattering length value ($a \sim -100$ fm) recently measured at MSU and RIKEN.

5. Modeling ^{19}B as a ^{17}B - n - n three-body system in the unitary limit
E. Hiyama, R. Lazauskas, F. M. Marqués, J. Carbonell, Phys. Rev. C100, 011603 R (2019)
6. **^{19}B isotope as a ^{17}B - n - n three-body system in the unitary limit**
J. Carbonell, E. Hiyama, R. Lazauskas and F.M. Marqués, J. Phys. Conf. Ser. (2020) 1643 012120 Contribution INPC Glasgow, SciPost Physics Proceedings (2019)
7. **Low-energy neutron scattering on light nuclei and ^{19}B as a ^{17}B - n - n three-body system in the unitary limit**
J. Carbonell, E. Hiyama, R. Lazauskas and F.M. Marqués
Contribution to EFB23, Guildford, sept. (2019)
Proceedings for the 24th edition of European Few Body Conference, Surrey, UK, 2-4 September 2019
SciPost Phys. Proc. 3, 008 (2020), doi: 10.21468/SciPostPhysProc.3.008

Date	14/1/2021
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Parte A. Personal data

Name	Felipe José Llanes Estrada		
Unique identifiers as a researcher	Researcher ID	C-1438-2017	
	Código Orcid	0000-0002-2565-4516	

A.1. Current employment

Entity	Universidad Complutense de Madrid		
Department	Física Teórica		
Address	Facultad Ciencias Físicas, Plaza de las Ciencias 1, 28040 Madrid		
Telephone	913944460	e-mail	filanes@fis.ucm.es
Level	Catedrático Universidad (professor)	Appointed on	20/4/2020
UNESCO specialization	2212.02, 2212.08, 2212.12		
Keywords	Particle physics, hadron physics, field theory		

A.2. Academic degrees (title, entity, date)

Degree	University	Year
Doctor en Física	Univ. Complutense Madrid	2001
(PhD in physics	North Carolina State University	2000)
Msc in physics	North Carolina State University	2000
Licdo. en Ciencias Físicas	Univ. Complutense de Madrid	1996
Physics Diploma	Univ. of Kent at Canterbury	1994

A.3. Aggregate indicators of scientific productivity

- ❖ Positive sexennial evaluations: 3 (1998-2003, 2004-2009, 2010-2015, this still current)
- ❖ Directed two PhD thesis: Juan M. Torres Rincón, 2012, Rafael Delgado López, 2016, both Extraordinary Doctoral prize and Springer Thesis prize; two ongoing doctoral students (Alexandre Salas Bernárdez and Eva Lope Oter).
- ❖ Additionally, ten Msc works directed, numerous undergraduate ones; Two directly supervised postdoctoral researchers, Richard Williams (2011-12) and Tim Van Cauteren (2006, 2007-08), assistance to others.
- ❖ Bibliographic data from [INSPIRE-HEP](#), appropriate to the FPN national plan of Nuclear and Particle Physics (within parenthesis, cross-check from the Harvard ADS database): $h = 32$ (29), 4350 (3320) citations, from which 2750 (2920) excluding coauthor selfcitations.
- ❖ Over 80 indexed publications containing original work (particularly excluding conf. proceedings), among them [5 in Physical Review Letters](#), 9 in Phys. Lett. B.
- ❖ 4 review articles (EPJA, EPJC, Prog. Nuc. Part. Phys. and one under revision for EPJST)
- ❖ Over 75 contributions and invitations to congresses.

Parte B. Brief Vitae

Earlier employment:

- ❖ Academic Secretary of the Department "Física Teórica I" (July 2007-June 2015)
- ❖ Prof. Titular de Universidad UCM (UK: Reader, US Assoc. Professor) (2009-2020)
- ❖ Prof. Contratado Doctor UCM (UK: Lecturer, US: Assist. Professor) (2004-2009)
- ❖ Ayte. Escuela Universitaria UCM (teaching assistant) (2001-2004)
- ❖ Research Assistant at North Carolina State University (1999-2000)
- ❖ Fellow of Jefferson Lab-Southern Universities Research Association (1998, 1999)
- ❖ Teaching Assistant of North Carolina State University (1997-1998)
- ❖ Military service (artillery ensign, 1995-1996)

Further long international stays, scholarships:

- ❖ Stage at the Technical Univ. of Vienna (May 2019)
- ❖ Stage at the Nuclear Theory Institute of Washington Univ., Seattle (Sept.-Oct. 2015)
- ❖ Caja Madrid fellowship to visit the Technische Univ. München (July-Oct. 2011)
- ❖ Faculty mobility scholarhip M^o Educación y Ciencia (Univ. Graz, July-Sept. 2007)
- ❖ Research Scholar at SLAC- Stanford Linear Accelerator Center (Feb.-Aug. 2005)
- ❖ Visiting research scholar Univ. Tübingen, fellowship from Deutsche Akademische Austausch Dienst (Oct.-Dec. 2003)
- ❖ Brief research stays at the universities of Graz, Darmstadt TU, Southampton, Indiana, New York, Instituto Superior Técnico de Lisboa, IFIC-Valencia, etc.
- ❖ Seminars and conferences delivered at many other institutes (CEA-Saclay, U. Barcelona, U. Salamanca, U. Washington at St. Louis, U. Murcia, etc.)

Parte C. MERITS

C.1. Publications (ten selected publications, referred to 2011-2020)

1.- Lightest flavor-singlet qqq baryons as witnesses to color

J. Estévez, Felipe J. Llanes-Estrada, V. Martínez-Fernández, A. Pastor-Gutiérrez
Phys.Rev.D **102** (2020) 11, 114032, <https://doi.org/10.1103/PhysRevD.102.114032>

2.- Using QCD Counting rules to Identify the Production of Gluonium

Stanley J. Brodsky, Felipe J. Llanes-Estrada
Phys.Lett.B 793 (2019) 405-410 <https://doi.org/10.1016/j.physletb.2019.05.011>

3.- nEoS: Neutron Star Equation of State from hadron physics alone.

Eva Lope Oter, Andreas Windisch, Felipe J. Llanes-Estrada and Mark Alford,
Journal of Physics G **46** (2019), 8. <https://doi.org/10.1140/epjc/s10052-014-2981-5>

4.-Coupling WW, ZZ unitarized amplitudes to $\gamma_b \gamma_b$ in the TeV region.

Rafael L. Delgado, Antonio Dobado, Felipe J. Llanes Estrada.
European Physical Journal C **77** 436. (2017).
10.1140/epjc/s10052-017-4768-y

5.-On neutron stars in f(R) theories: Small radii, large masses and large energy emitted in a merger.

Miguel Aparicio Resco, Álvaro de la Cruz-Dombriz, Felipe J. Llanes Estrada, Víctor Zapatero Castrillo.
Phys.Dark Univ. **13** (2016) 147-161
10.1016/j.dark.2016.07.001

6.- Possible new resonance from WLWL-hh interchannel coupling.

Rafael L. Delgado, Antonio Dobado, Felipe J. Llanes Estrada.
Physical Review Letters **114** 221803 (2015).
10.1103/PhysRevLett.114.221803

7.-Non-ordinary light meson couplings and the 1/Nc expansion.

Thomas Cohen, Felipe J. Llanes Estrada, Jose R. Peláez Sagredo and Jacobo Ruiz de Elvira Carrascal.
Physical Review D **90** 036003, 1- 25 (2014)
<http://journals.aps.org/prd/abstract/10.1103/PhysRevD.90.036003>

8.-QCD and strongly coupled gauge theories: Challenges and Perspectives

Nora Brambilla *et al.* (Felipe J. Llanes-Estrada), Eur.Phys.J.C **74** (2014) 2981.
10.1140/epjc/s10052-014-2981-5

9.-A First Estimate of Triply Heavy Baryon Masses from the pNRQCD Perturbative Static Potential

Felipe J. Llanes-Estrada, Olga I. Pavlova, Richard Williams.
Eur.Phys.J. **C72** (2012) 2019.
DOI: 10.1140/epjc/s10052-012-2019-9

10.-Two infrared Yang-Mills solutions in stochastic quantization and in an effective action formalism

Felipe J. Llanes-Estrada, Richard Williams,
Phys. Rev. D **86** 065034 (2012). 10.1103/PhysRevD.86.065034

The chosen publications show my mastery of Quantum Field Theory, High Energy Physics, Hadron and Many Body Physics, Effective Theories and particularly their unitarization, some astrophysics, etc

The Juan de la Cierva candidate for whom this CV is provided can find several of these research lines natural extensions of his own work and common themes of work on hadron physics naturally arise, so he would be very helpful. Moreover he will benefit from a fresh look at the problems that he has been addressing and a competitive environment that will hopefully elevate his publication list.

Others:

❖ Book chapter:

Handbook of LHC Higgs Cross Sections: 4. Deciphering the Nature of the Higgs Sector
International CERN collaboration with 868 pages, 374 authors, to assist experimental efforts,
<http://inspirehep.net/record/1494411>

❖ Full book: "Partículas Elementales: una vía hacia el cosmos", with coauthors Marina Ramón Medrano and Ramón Fernández Álvarez-Estrada.

C.2. Grants (all scientific research, referred to the last ten years)

Project name: Teorías efectivas en física de partículas y cosmología

PIs: ANTONIO DOBADO GONZALEZ and FELIPE J. LLANES

Funding agency: Ministerio de Economía y Competitividad

Start date: 01/01/2017 **End date:** 31/12/2020

Amount (possibly in direct costs): 86.000

Project name: Aplicaciones de las Teorías Efectivas Moderna

PIs: ANTONIO DOBADO GONZALEZ y FELIPE J. LLANES

Funding agency: Ministerio de Economía y Competitividad

Start date: 01/01/2015, **End date:** 31/12/2016

Cuantía total: 72.600

Project name: Aplicaciones de las Teorías Efectivas Modernas

PIs: ANTONIO DOBADO GONZALEZ

Funding agency: Ministerio de Economía y Competitividad

Start date: 01/01/2012, **End date:** 31/12/2014

Cuantía total: 72.600

Project name: TEORÍA DE CAMPOS, FÍSICA DE PARTÍCULAS Y COSMOLOGÍA: MECÁNICA ESTADÍSTICA Y APLICACIONES.

PIs: RAMON FERNANDEZ ALVAREZ-ESTRADA

Funding agency: Ministerio de Ciencias y Innovación

Start date: 01/01/2009, **End date:** 31/12/2012

Cuantía total: 140.000

Project name: CPAN "Centro Nacional de Física de Partículas, Astropartículas y Nuclear"

PIs: ANTONIO PICH ZARDOYA

Funding agency: Ministerio de Ciencias y

Innovación

Start date: 01/10/2007, **End date:** 30/09/2012

Project name: Promoción de los estudios sobre FAIR y el LHC en la Universidad Complutense en colaboración con el GSI

Entidad de realización: Gesellschaft Für Schwerionenforschung (GSI), Darmstadt

PIs: FELIPE JOSE LLANES ESTRADA

Funding agency: Ministerio de Ciencia y Tecnología

Start date: 01/01/2011 **End date:** 15/07/2012

Cuantía total: 4.600

Project name: HadronPhysics (Study of strongly interacting matter)

European Network, UCM hanging from UV-EG node.

Contract number: RII3-CT-2004-506078

Funding agency: 7th Framework programme EU

Project name: TEORIAS EFETIVAS E SUAS APLICAÇÕES NA FENOMENOLOGIA DAS PARTÍCULAS ELEMENTARES

PIs: LUCIANO ABREU MELO

Funding agency: FAESP (Brasil)

Project name: STRONG 2020

European transnational access grant, UCM autonomous node.

Felipe J. Llanes-Estrada member of the Governing Board.

Contract number: 824093

Funding agency: EU Horizon 2020 program

Participation in two European Cost Networks:

1. **PHAROS:** The multi-messenger physics and astrophysics of neutron stars (CA16214)
2. **VBSCAN:** Vector Boson Scattering (CA16108)

Others

- ❖ Outstanding referee of the American Physical Society (2014).
- ❖ Article *J.Phys. G* **41** (2014) 025002 with Antonio Dobado and Rafael Delgado selected as “Highlight of the year” of the british Journal of Physics G.
- ❖ Guest Editor of Topical Issue of british Journal of Physics G, Hadrons & Gravitational Waves after GW170817
- ❖ Cochairman of QNP06-IVth International Conference on Quarks and Nuclear Physics (Madrid 2006); of the IXth International Conference on Quark Confinement and the Hadron spectrum (Madrid 2010). Member of the organizing committee of another 10 scientific venues, the last ones XLVII Intnal. Meeting on Fundamental Physics, Aranjuez, June 2019, and the Vth Iberian-Russian congress, Madrid October 2020.
- ❖ Organizer of a Research program at the INT, Washington U. at Seattle, 2015.
- ❖ Organizer of an ECT* Trento program, 2013.
- ❖ Panelist for international grant reviewing: US Department of Energy (2015), Czech Academy of Sciences (2016,2020), Spanish Juan de la Cierva program, National and regional research grants for ANEP, AEI; COST association (2020).
- ❖ Supervision of doctoral programs: Andalusian (2018-19), Graz-Austria (2020).
- ❖ Extraordinary baccalaureate (1991) and undergraduate (1996) prizes.

Parte A. DATOS PERSONALES		Fecha del CVA		19/01/2021
Nombre y apellidos	MARTA ANGUIANO MILLÁN			
DNI/NIE/pasaporte		Edad		
Núm. identificación del investigador	Researcher ID	HD-6833-2015		
	Código Orcid	0000-0003-0238-4434		

A.1. Situación profesional actual

Organismo	Universidad de Granada		
Dpto./Centro	Física Atómica, Molecular y Nuclear		
Dirección	Granada, Andalucía, España		
Teléfono	958240029	Correo electrónico	mangui@ugr.es
Categoría profesional	Profesora Titular de Universidad	Fecha inicio	06/10/2009
Espec. cód. UNESCO	220719 Estructura Nuclear		
Palabras clave	Nuclear structure, Medical Physics		

A.2. Formación académica (título, institución, fecha)

Licenciatura/Grado/Doctorado	Universidad	Año
Licenciada en Físicas	Granada	1995
Doctora en Ciencias Físicas	Autónoma de Madrid	2000

A.3. Indicadores generales de calidad de la producción científica (véanse instrucciones)

Indicador	Medida
Índice H	16.0
Número de citas	995.0
Publicaciones	69.0
Sexenios de investigación	3.0
Tesis dirigidas en los últimos 10 años	1.0
Fecha del último sexenio	01/01/2015

Parte B. RESUMEN LIBRE DEL CURRÍCULUM

I graduated in Physics from the University of Granada. After that, I moved in 1996 to the Department of Theoretical Physics in the Universidad Autónoma de Madrid to do the PhD in the group of Prof. L. Egidio. I began to work in topics related to nuclear structure, in particular in models beyond mean-field including restoration of symmetries to study superdeformed nuclei using effective interactions of finite range and density dependent. In particular, my PhD was about particle number restoration in the HFB model using Gogny forces. In 2000, after finished my PhD, I moved to the Department of Physics in the University of Lecce (Italy) to work with the group of Prof. Giampaolo Co'. In that time, I worked in topics related to nuclear structure and scattering of electro-weak probes with nuclei. In 2004, after a brief incursion in the Medical Physics field thanks to a research position in the Instituto de Física Aplicada (CSIC, Madrid) from February 2003 to August 2004, I moved to Granada with a five years position, getting in 2009 a permanent one (as associate profesor). Since 2004 my research work is mainly related with two topics: theoretical nuclear physics and medical physics. In the first one, I collaborate mainly with Dr. A.M. Lallena (Univ. Granada), Dra. De Donno (Univ. Salento, Italy), Prof. Co' (Univ. Salento, Italy) and recently with Dra. Grasso (IN2P3, Orsay, France) and R. Bernard (CEA, France). In the last few years we have been involved in developing a calculation scheme Hartree-Fock plus RPA using a general effective nucleon-nucleon interaction of finite range type and including tensor terms. Calculations of nuclear excited states have been carried out by our group in a fully self-consistent manner and the effect of tensor contributions on these excited states has been studied. We have extended the model to include the treatment of the continuum (CRPA). Finally, we have considered pairing effects in a Hartree-Fock plus BCS scheme using the same interaction and some parametrizations for the tensor term have been proposed. In medical physics I have been involved in some problems related to the transport of radiation in matter and I have supervised a thesis in the field of X-ray dosimetry. In general, the problems that we have analyzed have to do with the application of Monte Carlo techniques to specific situations of clinical interest. Together with the Prof. A. M. Lallena, we have collaborated with the Departamento de Electrónica of the University of Granada (Dr. M.A. Carvajal, A. Palma and S. Martínez-García) to develop a new MOSFET based dosimetry system. We collaborate with some radio-physicists working at various hospitals in Granada and Málaga. In the last years, in collaboration with W. González and A.M. Lallena (Univ. Granada), we have proposed a photon source model for clinical heads in photon mode and another one for the electron contamination. These results are part of the doctoral thesis (April 2015) of W. González.

In 2018 I have spent three months in the group of Dr. Paganetti in the MGH (Boston, USA), expert in the field of protontherapy, thanks to a Fulbright grant.

Parte C. MÉRITOS MÁS RELEVANTES (ordenados por tipología)

C.1. Publicaciones

1. G. Co', M. Anguiano, A.M. Lallena, Nuclear structure uncertainties in coherent elastic neutrino-nucleus scattering. *Journal of Cosmology and Astroparticle Physics* 04 (2020)044, pp. 1-26
2. R. N. Bernard, N. Pillet, L.M. Robledo, M. Anguiano., Description of the asymmetric to symmetric fission transition in the neutron-deficient thorium isotopes: Role of the tensor force. *Physical Review C* 101 (2020) 044615-1-22.
3. G. Co', M. Anguiano, A.M. Lallena, Shell closure at N=34 and the ^{48}Si nucleus, *Int. Journ. Mod. Phys. E28* (2019) 1950054.
4. M. Anguiano, A.M. Lallena, R. Bernard and G. Co', 2019, *Neutron gas and pairing*. *Phys. Rev. C99*, 034302.
5. F. Martínez-Martí, M.S. Martínez-García, M.A. Carvajal, A.J. Palma, M. Anguiano, A.M. Lallena, Fractal behavior of the trajectories of the foot centers of pressure during pregnancy, *Biomed. Phys. Eng. Express* 5 (2019) 025007.
6. G. Co', M. Anguiano, V. De Donno and A.M. Lallena, 2018, *Matter distribution and spin-orbit force in spherical nuclei*. *Phys. Rev. C97*, 034313.
7. G. Co', V. De Donno, M. Anguiano and A.M. Lallena, 2017, *Pairing in spherical-nuclei: Quasiparticle random-phase approximation calculations with the Gogny interaction*. *Phys. Rev. C95*, 054329.
8. W. González, M. Anguiano and A.M. Lallena, 2017. *Performance of a virtual source model for stereotactic radiosurgery with a dynamic micro-multileaf collimator*. *Biomed. Phys. Eng. Express*. 3, 065008.
9. G. Co', V. De Donno, M. Anguiano and A.M. Lallena, 2016, *Self-consistent continuum random-phase approximation with finite-range interactions for charge-exchange excitations*. *Phys. Rev. C93*, 034320.
10. R.N. Bernard and M. Anguiano, 2016, *Interplay between tensor force and deformation in even-even nuclei*. *Nucl. Phys. A953*, 32.
11. M. Anguiano, R.N. Bernard, A.M. Lallena, G. Co' and V. De Donno 2016, *Interplay between pairing and tensor effects in the N=82 even-even isotone chain*. *Nuc. Phys. A955*, 181.
12. M. Anguiano, A.M. Lallena, G. Co', V. De Donno, M. Grasso, R.N. Bernard, 2016, Gogny interactions with tensor terms. *Eur. Phys. J. A52*, 183.
13. G. Co', V. De Donno, M. Anguiano and A.M. Lallena, 2016, Continuum Random Phase Approximation with finite-range interactions. *Eur. Phys. J. A52*, 145.
14. W. González, M. Anguiano and A.M. Lallena, 2015, A source model for the electron contamination of clinical linac heads in photon mode, *Biomed. Phys. Eng. Express* 1, 025202.
15. W. González, I.-B. García, M. Anguiano and A.M. Lallena, 2015, A general photon source model for clinical linac heads in photon mode. *Radiat. Phys. Chem.* 117, 140.
16. G. Co', V. De Donno, M. Anguiano, R.N. Bernard and A.M. Lallena, 2015, Electric quadrupole and magnetic dipole moments of odd nuclei near the magic ones in a self-consistent approach. *Phys. Rev. C92*, 024314.
17. M. Grasso and M. Anguiano, 2015, Neutron 2p and 1f spin-orbit splittings in ^{40}Ca , ^{36}S and ^{34}Si N=20 isotones, Tensor-induced and pure spin-orbit effects. *Phys. Rev. C92*, 054316 (2015).
18. V. De Donno, G. Co', M. Anguiano and A.M. Lallena, 2014, *Charge-exchange excitations with finite-range interactions including tensor terms*, *Phys. Rev. C90*, 024326-1-14.
19. M. Anguiano, A.M. Lallena, G. Co' and V. De Donno, 2014, *A study of self-consistent Hartree-Fock plus Bardeen-Cooper-Schrieffer calculations with finite-range interactions*. *J. Phys. G: Nucl. Part. Phys.* 41, 025102.
20. U. Chica, M. Anguiano, M. Vilches and A.M. Lallena, 2014, *Quality indexes based on water measurements for low and medium energy x-ray beams: A theoretical study with PENELOPE*. *Med. Phys.* 41 012101.
21. V. De Donno, G. Co', M. Anguiano and A.M. Lallena, 2014, *Coulomb and spin-orbit interactions in random-phase approximation calculations*, *Phys. Rev. C89* 014309-1-11.
22. M. Grasso and M. Anguiano, 2013, *Tensor parameters in Skyrme and Gogny effective interactions: Trends from a ground-state-focused study*, *Phys. Rev. C88*, 054328-1-16.

23. U. Chica, M. Anguiano and A.M. Lallena, 2013, *On the behaviour of f_{cQ} factors with quality indexes for medium energy x-ray beams: A Monte Carlo study with PENELOPE*. Radiat. Phys. Chem. 90 (2013) 73.
24. G. Co', V. De Donno, M. Anguiano and A.M. Lallena, 2013, *Pygmy and giant electric dipole responses of medium-heavy nuclei in a self-consistent random phase approximation approach with finite-range interaction*, Phys. Rev. C87, 034305-1-10.
25. M. Anguiano, M. Grasso, G. Co', V. De Donno and A.M. Lallena, *Tensor and tensor-isospin terms in the effective Gogny interaction*, Phys. Rev. C86 (2012) 054302.
26. G. Co', V. De Donno, M. Anguiano and A.M. Lallena, *Nuclear proton and neutron distributions in the detection of weak interacting massive particles*, Journ. Cosm. Astr.Phys.11 (2012) 10.
27. M.T. Blázquez, M. Anguiano et al., *On the length of stabilograms: A study performed with detrended fluctuation analysis*, Physica A 391 (2012) 4933.
28. G. Co', V. De Donno, M. Anguiano and A.M. Lallena, *Magnetic excitations in nuclei with neutron excess*, Phys. Rev. C85 (2012) 034323.
29. G. Co', V. De Donno, P. Finelli, M. Grasso, M. Anguiano et al., *Mean-field calculations of the ground states of exotic nuclei*, Phys. Rev. C85 (2012) 024322.
30. V. De Donno, M. Anguiano, G. Co' and A.M. Lallena, *Self-consistent continuum random-phase approximation calculations of ^4He electromagnetic responses*, Phys. Rev. C84 (2011) 037306.
31. M. Anguiano, G. Co', V. De Donno and A.M. Lallena, *Tensor effective interaction in self-consistent random-phase approximation calculations*, Phys. Rev. C83 (2011) 064306.
32. V. De Donno, G. Co', M. Anguiano and A.M. Lallena, *Self-consistent continuum random-phase approximation calculations with finite-range interactions*, Phys. Rev. C83 (2011) 044324.
33. U. Chica, G. Flórez, M. Anguiano and A. M. Lallena, *A simple analytical expression to calculate the backscatter factor for low energy X-ray beams*, Physica Medica 27 (2011) 75.
34. M. Moreno-Torres, M. Grasso, H. Liang, V. De Donno, M. Anguiano and N. Van Giai, *Tensor effects in shell evolution at $Z, N=8, 20$ and 28 using nonrelativistic and relativistic mean-field theory*, Phys. Rev. C81 (2010) 064327.
35. M.A. Carvajal, S. García-Pareja, D. Guirado, M. Vilches, M. Anguiano, A.J. Palma and A.M. Lallena, *Phys. Med. Biol.*54 (2009) 6263.
36. G. Co', V. De Donno, C. Maieron, M. Anguiano and A.M. Lallena, *Evolution of the pygmy dipole resonance in nuclei with neutron excess*, Phys. Rev. C80 (2009) 014308.
37. U. Chica, M. Anguiano and M. Anguiano, *Benchmark of PENELOPE for low and medium energy X-rays*, Physica Medica 25 (2009) 51.
38. M.T. Blázquez, M. Anguiano et al., *Study of the human postural control system during quiet standing using detrended fluctuation analysis*, Physica A388 (2009) 1857.
39. V. De Donno, G. Co', C. Maieron, M. Anguiano et al., *Low-lying magnetic excitations of doubly-closed-shell nuclei and nucleon-nucleon effective interactions*, Phys. Rev. C79 (2009) 044311.
40. M. Vilches, S. García-Pareja, R. Guerrero, M. Anguiano and A.M. Lallena, *Multiple scattering of 13 and 20 MeV electrons by thin foils: A Monte Carlo study with GEANT, geant4 and PENELOPE*, Med. Phys. 36 (2009) 3964.

C.2. Proyectos

1. Reference: PID2019-104888GB-I00. Title: Dosimetría física de protones y estructura nuclear. Funding institution: Ministerio de Ciencia e Innovación. Call: Plan Nacional I+D+i 2019. Principal investigator: Dra. Marta Anguiano Millán (IP1) y Dr. Miguel Ángel Carvajal Rodríguez (IP2). Affiliation: Universidad de Granada. From: 01/06/2020 to 31/05/2023. Total quantity: 117370,00 €
2. Reference: P18-RT-2327. Title: Dosimetría física de haces clínicos de protones. Funding institution: Junta de Andalucía. Call: Proyectos I+D+i Junta de Andalucía 2018. Principal investigator: Dra. Marta Anguiano Millán (IP1) y Dr. Miguel Ángel Carvajal Rodríguez (IP2). Affiliation: Universidad de Granada. From: 01/01/2020 to 31/12/2022. Total quantity: 119800,00 €.
3. Reference: FPA2015-67694-P. Title: Desarrollos para Física Nuclear Fundamental y Aplicaciones. Funding institution: Ministerio de Economía y Competitividad (MINECO). Call: Plan Nacional I+D+i 2015. Principal investigator: Dr. Daniel Rodríguez Rubiales (IP1) y Dra. Marta Anguiano Millán (IP2). Affiliation: Universidad de Granada. From: 01/01/2016 to 12/31/2019 Total quantity: 176400,00 €
4. Reference: FPA2012-31993. Title: Dosimetría física y estructura nuclear. Funding institution: Ministerio de Economía y Competitividad (MINECO). Call: Plan Nacional I+D+i 2012. Principal investigator: Dra. Marta Anguiano Millán. Affiliation: Universidad de Granada. From 01/01/2013 to 12/31/2015. Total quantity: 31590,00 €

5. Reference: FPA2009-14091-C02-02. Title: Simulación Monte Carlo del transporte de radiación: Física, métodos numéricos y aplicaciones. Funding institution: Ministerio de Economía y Competitividad (MINECO). Call: Plan Nacional I+D+i 2009. Principal investigator: Dra. Marta Anguiano Millán. Affiliation: Universidad de Granada. From 01/01/2010 to 12/31/2012. Total quantity: 98010,00 €
6. Reference: P09-FQM-5341. Title: Intercomparación de sistemas de dosimetría in vivo en radioterapia. Caracterización y puesta en marcha de un nuevo sistema basado en MOSFET. Funding institution: Consejería de Innovación y Ciencia (Junta de Andalucía). Call: Proyectos de excelencia 2009. Principal investigator: Dr. Antonio M. Lallena Rojo. Affiliation: Universidad de Granada. Participation: Investigator. From 01/01/2010 to 06/30/2014. Total quantity: 510.995,68 €
7. Reference: IPT-300000-2010-3. Title: PRECISION: Investigaciones en tecnologías de tratamiento guiado por imagen y simulación para un práctica en radioterapia segura Entidad financiadora: Ministerio de Ciencia e Innovación. Call: Ayudas al Subprograma INNPACTO 2010. Principal investigator: Mr. Carlos Illana. Afiliación: GMV Aerospace and Defense S.A.. Responsible at University of Granada: Dr. Antonio M. Lallena Rojo. Participation: Investigator. From 07/01/2010 to 12/31/2013. Total quantity: 621.327,00 € (193.127,00 € for University of Granada)
8. ELICSIR - 857558. ELICSIR. Unión Europea H2020. 2019-2022. 791812 EUR. Investigador/a.

C.3. Contratos, méritos tecnológicos o de transferencia

C.4. Patentes

C.5. Congresos

1. EFFECT OF THE MULTIPLE SCATTERING OF ELECTRONS IN REALISTIC MONTE CARLO SIMULATION. 01/01/2010. ESTRO Congress.
2. Invited talk to the “First Gogny Conference”, in Bruyères le Chatel (Paris). Talk title: “Gogny interactions with tensor terms”. 8-11 december 2015.
3. Invited talk to the conference “Landau Fermi liquid theory in nuclear and many body systems”, ECT* Trento (May 2017).

C.6. Tesis Doctorales dirigidas

1. “ESTUDIO DEL FORMALISMO PARA LA DETERMINACION DE LA DOSIS ABSORBIDA EN AGUA PARA HACES DE RAYOS X DE ENERGÍAS BAJAS Y MEDIAS”. Enero 2010. Autor: Uriel Chica Villegas. Directores de tesis: Antonio M. Lallena y M. Anguiano

C.7. Otros méritos

1. Fellowship in the Salvador de Madariaga (Fulbright program) to do a stay in the Massachusetts General Hospital (Harvard Medical School) with Dr. Paganetti. From July 1 to September 30 (2018).
2. Evaluator in the Agencia Nacional de Evaluación y Prospectiva para Proyectos de Investigación: 2014, 2015, y 2016, 2017, 2018 y 2019.
3. Membership of the editor Committee of the “Revista Española de Física Médica”. 2010-2014.
4. Cursos 0 para las titulaciones de la facultad de Ciencias de la UGR. 29/06/2017.
5. Profesora del módulo 1 de los Cursos de Baeza de “Fundamentos de Física Médica” (UNIA). Curso 2020-21.

Part A. Personal Information

DATE	06/04/2021

Surname(s)	AMARO SORIANO	
Forename	JOSE ENRIQUE	
Researcher codes	WoS Researcher ID (*)	K25512012
	SCOPUS Author ID(*)	
	Open Researcher and Contributor ID (ORCID)	0000-0002-3234-9755

(*) At least one of these is mandatory

A.1. Current position

Post/ Professional Category	CATEDRATICO DE UNIVERSIDAD	
UNESCO Code	220717 nuclear reactions and scattering	
Key Words	Physics, nucleus, atom, electron, neutrino, relativity, energy	
Name of the University/Institution	UNIVERSIDAD DE GRANADA	
	Department/Centre	Física Atómica Nuclear Molecular / Facultad Ciencias
	Full Address	Av. Fuentenueva Granada
	Email Address	amaro@ugr.es
	Phone Number	958240021
Start date	2016	

A.2. Education (title, institution, date)

Year	University	Degree	Title
1989	Granada	First degree	Licenciado en Ciencias Físicas
		Masters (if appropriate)	
1993		PhD	Doctor en Ciencias Físicas

A.3. Indicators of Quality in Scientific Production (See the instructions)

<p>a) total number of citations 2726, average number of citations during the last five years 210 b) total number of publications in the first quartile (Q1) 66 c) H-index h = 30 d) thesis supervised: 2 e) 131 publications in Web Of Science. f) Inspire-HEP (High energy physics) database indicators: 142 publications, 3361 citations, 6 very well known papers, 16 well-known papers, 53 known papers. H=32. Google Academic indicators: 4579 citations, h=39.</p>
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Part B. Free Summary of CV (Max. of 3.500 characters, including spaces)

Degree in Physics, U. Granada, 1989. Degree Tesis, 1991. PhD Tesis 1993. PhD Grant F.P.I (MEC 1990—1993). Profesor Asociado 1993--1999. Profesor Titular de Universidad 1999--2016. Catedrático de Universidad (2016--). Member of Instituto Carlos I de Física Teórica y Computacional (2011--). Leader of research group FQM225 Junta de Andalucía (2011--). Secretario of Departamento de Física Atómica, Molecular y Nuclear (2009—2017). 5 sexenios de investigación (research) 1990—2019, 6 quinquenios (teaching).

Researchlines: theoretical nuclear physics, nucleon-nucleon interaction, intermediate energy nuclear reactions, neutrino scattering by nuclei, electron scattering by nuclei, meson exchange currents, relativistic effects, polarization observables, pion production.

Scientific and technical interests and objectives: Relativistic theory and models of nuclear reactions induced by neutrinos and electrons at intermediate energy. Two-body effects in nuclei, nuclear correlations, nucleon-nucleon interaction, meson exchange currents.

Selected scientific and technical goals: Contribution to the most precise determination of the nuclear force [Physical Review C 88 064002 (2013) selected by the editor]. Contribution to a global model of electron and neutrino scattering with nuclei based on the scaling properties of the nuclear response and a microscopic model of meson exchange currents [6,7,10].

Participation in 40 research projects (national and international). Supervisor of 2 PhD Thesis, 4 Master thesis, 1 degree thesis, and 1 Tesi di Laurea (Universidad de Pisa, Italia).

Over 150 scientific publications (131 in WOS). Over 100 papers in journals with referee, in particular: 5 Physical Review Letters (Q1), 1 Physics Reports (Q1), 11 Physics Letters B (Q1), 38 Physical review C (Q1), 10 Physical review D (Q1), 4 Annals of Physics (Q1), 17 Nuclear Physics A (Q2), 7 Journal of Physics G (Q2), 3 European Physical Journal A (Q2).

Over 50 publications in proceedings (29 are indexed in WOK, 28 are book chapters, 11 AIP Conference Proceedings, 1 Progress in Particle and Nuclear Physics, 2 Nuclear Physics A, 2 Nuclear Physics B, 4 Few Body Systems, 2 Acta Physica Polonica B). **23 conference communications** presented by myself (15 invited talks, 3 talks, 8 posters. Plenary speaker in NuInt09).

Research visits and stays in international centers: Dipartimento di fisica, Universidad de Lecce, Lecce (Italia). 3 stays of one month each between 1991--1993.

Massachusetts Institute of Technology (M.I.T.), Center for theoretical Physics, Cambridge (MA). 4 stays: From 12/07 to 10/08, 1994, from 16/07 to 18/12, 1995, from 19/06 to 17/12, 1996, from 3/07 to 3/08, 1998. Institute for Nuclear Theory (I.N.T.), University of Washington, Seattle, from 27/06 to 30/07, 1997. Turin University, 17 one-week stays between 1996 and 2019, More than 20 short visits to Sevilla University

Referee in scientific journals: Physical Review C (30 referrals), Nuclear Physics A (5), European Physical Journal A (2), European Physical Journal plus (1), St Petersburg Polytechnic University Journal (1), Fisika B (1), Acta Physica Polonica B (1).

Part C. Relevant accomplishments

C.1. Publications *relevant 10 publications*

Global analysis of the COVID-19 pandemic using simple epidemiological models, Amaro, Jose Enrique; Dudouet, Jeremie; Orce, Jose Nicolas.

APPLIED MATHEMATICAL MODELLING 90 (2021) 995.

Electron- versus neutrino-nucleus scattering. By Amaro, J. E.; Barbaro, M. B.; Caballero, J. A.; Gonzalez-Jimenez, R; Megias, G.D, Ruiz Simo, I.

JOURNAL OF PHYSICS G-NUCLEAR AND PARTICLE PHYSICS 47 (2020) 124001.

NN Scattering and Nuclear Uncertainties.

Ruiz Arriola, Enrique; J.E. Amaro; Perez, Rodrigo Navarro

FRONTIERS IN PHYSICS 8 (2020) 1.

Realistic spectral function model for charged-current quasielastic-like neutrino and antineutrino scattering cross sections on ^{12}C , M.V. Ivanov, A.N. Antonov, G.D. Megias, J.A. Caballero, M.B. Barbaro, J.E. Amaro, I. Ruiz Simo, T.W. Donnelly, J.M. Udías,

Phys.Rev. C99 (2019) no.1, 014610.

Neutrino-Oxygen $CC0\pi$ scattering in the SuSAv2-MEC model

G.D. Megias, M.B. Barbaro, J.A. Caballero, J.E. Amaro, T.W. Donnelly, I. Ruiz Simo, J.W. Van Orden, **J.Phys. G46 (2019) no.1, 015104**

Global Superscaling Analysis of Quasielastic Electron Scattering with Relativistic Effective Mass, J.E. Amaro, V.L. Martinez-Consentino, E. Ruiz Arriola, I. Ruiz Simo,

Phys.Rev. C98 (2018) no.2, 024627

Quasielastic charged-current neutrino scattering in the scaling model with relativistic effective mass, I. Ruiz Simo, V.L. Martinez-Consentino, J.E. Amaro, E. Ruiz Arriola, **Phys.Rev. D97 (2018) no.11, 116006**

Low energy peripheral scaling in nucleon-nucleon scattering and uncertainty quantification, Ruiz Simo, I.; Amaro, J. E.; Ruiz Arriola, E.; R. Navarro Perez, JOURNAL OF PHYSICS G-NUCLEAR AND PARTICLE PHYSICS 45 (2018), 035107.

Two-nucleon emission in neutrino and electron scattering from nuclei: The modified convolution approximation. Ruiz Simo, I.; Amaro, J. E.; Barbaro, M. B.; et ál., ANNALS OF PHYSICS 388 (2018) 323.

Fermi-momentum dependence of relativistic effective mass below saturation from superscaling of quasielastic electron scattering, Martinez-Consentino, V. L.; Ruiz Simo, I.; Amaro, J. E.; E. Ruiz Arriola. PHYSICAL REVIEW C 96 (2017), 064612

C.2. Research Projects and Grants

Física hadrónica, nuclear y astropartículas, Ministerio de economía y competitividad. Plan Nacional I+D, FIS2017-85053-C2-1-P, E. Ruiz-Arriola, (Univ.Granada). 2018-2021.

Física hadrónica y nuclear. Ministerio de economía y competitividad. Plan Nacional I+D, FIS2014-59386P, E. Ruiz-Arriola, (Univ.Granada). 2015-2017. 84000 EUR. Researcher #2.

Dinámica de sistemas hadrónicos en física nuclear a energías intermedias. Ministerio de Ciencia y tecnología, Plan nacional I+D, FIS2011-24149. E. Ruiz-Arriola (UGR). 2012-2014. 127000 EUR. Researcher.

Dinámica relativista en dispersión de electrones y neutrinos. MINISTERIO DE CIENCIA E INNOVACIÓN. Acción complementaria INFN (Italia) Ref. AIC-D-2011-0704. Caballero-Carretero, Juan Antonio (Universidad de Sevilla). 2011-2013. 2300 EUR. Researcher

Dinámica relativista en dispersión de electrones y neutrinos. AIC10-D-00051. Ministerio de Ciencia e Innovación. Prog. Nac. Internacionalización I+D. Subprog. De actuaciones relativas a infraestructuras científicas internacionales. Modal. D. Caballero-Carretero, Juan Antonio (Universidad de Sevilla). 2011-2012. 3450 EUR. Researcher.

C.3. Contracts

C.4. Patents and other IPR

C.5. PhD Thesis Supervisor

1) Rodrigo Navarro Pérez. Statistical error analysis of the nuclear forces. UGR. 24 february 2015. Sobresaliente. Supervisors: E. Ruiz Arriola and José Enrique Amaro Soriano.

2) Manuel Valverde Hermosilla. Interacción neutrino-núcleo a energías intermedias. UGR, 27 july2007. Sobresaliente cum laude por unanimidad. Supervisors: J. Nieves and J.E. Amaro.

C.5. Talks in conferences (selected over the few last years)

Planck Monte Carlo and Android App Awareness.

NITheP Mini School Mathematical modelling of COVID-19.

Online Lecture at the National Institute of Theoretical Physics, South Africa, 30-3-2021.

Theoretical uncertainty of quasielastic neutrino cross sections from superscaling with relativistic effective mass. Invited talk **NuInt 18 - 12th International Workshop on**

Neutrino-Nucleus Interactions in the Few-GeV Region, Gran Sasso Science Institute (GSSI, L'Aquila Italy) 15-19 october 2018

Fully relativistic treatment of pionic correlations and meson-exchange currents. Invited talk at the workshop **Two-body current contributions in neutrino-nucleus scattering**. CEA Saclay, Francia. 18—22 april 2016.

Inclusion of MEC in the SuSA-based calculations: status and perspectives. Invited talk at: **NuInt14: 9th International Workshop on neutrino-nucleus interactions in the few-GeV region**. Seldsdonpark Hotel, Surrey, UK. 19—24 may 2014.

SuSA-based calculations of multi-nucleon effects in scattering. Invited talk at: **INT workshop on neutrino-nucleus interactions INT13-54W**. Institute for Nuclear Theory, Seattle, USA. 3—11 december 2013.

Error analysis of nuclear matrix elements. Talk at the **22th European Conference on few-body problems in physics EFB22**. Cracovia (Polonia). 9—13 september 2013.

Meson-exchange currents in intermediate energy electron scattering. Invited talk at the **workshop on modeling charge-changing and neutral-current neutrino reactions with nuclei**. ECT*, Trento (Italia). 12—16 december 2011.

C.6. Gestion of scientific activity

1) Head of the research group FQM225: Física Nuclear a energías intermedias. Junta de Andalucía. From february 2011.

C.7. Books

Android: Programación de dispositivos móviles a través de ejemplos segunda edición. José Enrique Amaro Soriano. Editorial Marcombo, Barcelona, 2019. ISBN: 978-84-267-2676-6. 363 pages. Published also in Mexico, editorial Alfaomega.

La posibilidad de viajar en el tiempo: senderos cósmicos al futuro y al pasado (colección un paseo por el cosmos). Author: José Enrique Amaro Soriano. Editorial R.B.A. Barcelona. Publication date: 2016. ISBN: 978-84-473-8385-6. 160 pages. Translated to Italian and french. Published in Spain, Italy, France, Argentina.

Helmholtz: la conservación de la energía. Sin fecha de caducidad (colección Grandes Ideas de la Ciencia). Author: José Enrique Amaro Soriano. Editorial R.B.A., Barcelona 2014. ISBN: 978-84-473-7775-6. 160 pages. Translated to Italian, French and Russian. Published in Spain, Italy, France, Russia, Chile and Peru.

El Gran Libro de Programación Avanzada con Android. Author: José Enrique Amaro Soriano. Editorial Marcombo, Barcelona, 2012. ISBN: 978-84-267-1885-3. 400 pages. Published also in Mexico and e-book. 34 cites in Google academic.

Android: Programación de dispositivos móviles a través de ejemplos. Author: José Enrique Amaro Soriano. Editorial Marcombo, Barcelona, 2012. ISBN: 978-84-267-1767-2. 268 pages. Published also in Mexico and as e-book. 52 cites in Google Academic.

C.8. Other Publications

Hermann von Helmholtz. Mi clásico favorito. Author: José Enrique Amaro Soriano. Revista Española de Física, Vol 30, No. 4 (2011)

Part A. PERSONAL INFORMATION		CV date	17/Febrero/2021
First and Family name	González Férez María Rosario		
ID number		Age	
Researcher codes	WoS Researcher ID (*)	A-2421-2009	
	SCOPUS Author ID(*)		
	Open Researcher and Contributor ID (ORCID) **	0000-0002-8871-116X	

(*) At least one of these is mandatory

(**) Mandatory

A.1. Current position

Name of University	Universidad de Granada		
Department	Atomic, Molecular and Nuclear Physics		
Address and Country	Avda. Fuentenueva SN, Granada, Spain		
Phone number	680601944	E-mail	rogonzal@ugr.es
Current position	Profesor Titular de Universidad	From	2008
Key words	ultracold and cold atoms and molecules, Rydberg atoms and Rydberg molecules		

A.2. Education

PhD	University	Year
Physics	Universidad de Granada	2001

A.3. JCR articles, h Index, thesis supervised

Number of Publications: 63, 17 in D1, 46 in Q1 & 50 in T1 of WOS, 20 in period 2015-2020.
Sum of Citations: 1046 (Web of Science). Average of Citations per year in 2010-2020: 85
Average Citations per Article: 14.9 (Web of Science). H-index: 20 (Web of Science)
Research six-year terms of the Spanish Ministry of Science: 3 (last one 2009-2014)
5 PhD thesis supervised (2008, 2010, 2013, 2018, 2020).

Part B. CV SUMMARY (max. 3500 characters, including spaces)

I am Associate Professor in the Department of Atomic Molecular and Nuclear Physics at the Universidad de Granada (UGR) in Spain since 2008. I did my PhD in Physical Sciences at the UGR in 2001 about the interaction of atoms with strong magnetic fields, obtaining the Award for Excellence in Ph.D. in Physics 2000-2001. After my PhD, I got the prestigious Alexander von Humboldt fellowship to do a post-doctoral stay at the University of Heidelberg within the leading group in theoretical molecular physics of Prof. L. Cederbaum. In 2004, I joined the UGR with a contract of the program "Retorno de investigadores a Centros de Investigación Andaluces".

My research is devoted to theoretically investigate the structure, interactions and dynamics of cold and ultracold atoms and molecules in external fields, highlighting the theoretical interpretation of experimental results and experimental proposal for creating ultracold systems. I have collaborations with experimental groups, and my theoretical studies have explained and interpreted their observations. Due to my contributions in the field of atomic and molecular physics, I have received The Mildred Dresselhaus Award for Young Scientists 2013 from The Hamburg Centre for Ultrafast Imaging (CUI) at the University of Hamburg (Hamburg, Germany). I have done research stays at University of British Columbia, Harvard University (ITAMP), Freie Universität Berlin, University of Connecticut, University of Heidelberg, University of Tübingen, University of Hamburg, and The Kavli Institute for Theoretical Physics at University of California Santa Barbara.

I have over 60 peer-reviewed papers in high-impact journals (Phys. Rev. Let., New J. Phys., J. Chem. Phys., Phys. Chem. Chem. Phys., Phys. Rev. A). My results have been presented in many international workshops and conferences of AMO physics, 38 times as invited speaker. I have given more than 35 invited lectures and seminars at different universities and

research centers around the world. I have supervised 5 PhD theses, 9 Master theses, 4 Bachelor Theses, and currently I am supervising 1 PhD, 4 master and 1 undergraduate students. Regarding outreach, I regularly participate in the programs “Ciencia y Sociedad”, “Semana de la Ciencia”, “Día de puertas abiertas del Parque de las Ciencias de Granada” and “Pint of Science”.

Regarding academic and scientific management, I was the PI at the University of Granada of a Marie Curie Action Initial Training Network of the European Union, and of several Spanish research projects. I have been the academic coordinator of the Master Program in Physics and Mathematics FisyMat of the UGR (November 2012 - May 2017), and I am member of the academic commission of the Doctoral Program in Physics and Mathematics FisyMat. I have been Referee of the ANEP (Ayudas Formación Posdoctoral 2013 and Ramon y Cajal 2014, Plan Nacional), of the German Research Foundation, and of the European Research Council. I am chair of the board of the European Group of Atomic Systems EGAS of the European Physical Society since July 2018, member of the Commission on Atomic, Molecular and Optical Physics (C.15) of the International Union of Pure and Applied Physics (IUPAP) for the term 2018 – 2021, and of the Atomic, Molecular and Optical Physics Division of the European Physical Society since July 2018. I am guest editor in the Journal of Physics B: Atomic, Molecular and Optical Physics, and editor of the *IOP SciNotes*.

Part C. RELEVANT MERITS

C.1. Publications (including books)

A selection of the 36 papers that I have published in peer review journals during 2010-2020:

- **R. González-Férez**, M. Iñarrea, J.P. Salas & P. Schmelcher, *Nonlinear dynamics and energy transfer for two rotating dipoles in an external field: A complete dimensional analysis*, Communications in Nonlinear Science and Numerical Simulation **82**, 105049 (2020)
- A. Crubellier, **R. González-Férez**, C.P. Koch, & E. Luc-Koenig (2019), *Controlling ultracold p-wave collisions with nonresonant light: Predictions of an asymptotic model*, Phys. Rev. A **99**, 032710, (3 citations WOS).
- N. Sandor, **R. González-Férez**, P.S. Julienne, & G. Pupillo, *Rydberg optical Feshbach resonances in cold gases*, Physical Review A **96**, 032719 (2017). (9 citations WOS).
- A. Crubellier, **R. González-Férez**, C.P. Koch, & E. Luc-Koenig, *Controlling the s-wave scattering length with nonresonant light: Predictions of an asymptotic model*, Physical Review A **95**, 023405 (2017). (4 citations WOS).
- S. Trippel, T. Mullins, N.L.M. Müller, J.S. Kienitz, **R. González-Férez** & J. Küpper, *Two-State Wave Packet for Strong Field-Free Molecular Orientation*, Physical Review Letters **114**, 103003 (2015). (24 citations WOS).
- **R. González-Férez**, H.R. Sadeghpour & P. Schmelcher, *Rotational hybridization, and control of alignment and orientation in triatomic ultralong-range Rydberg molecules*, New Journal Physics **17**, 013021 (2015). (9 citations WOS).
- M. Tomza, **R. González-Férez**, C.P. Koch, & R. Moszynski, *Controlling magnetic Feshbach resonances in polar open-shell molecules with non-resonant light*, Physical Review Letters **112**, 113201 (2014). (26 citations WOS).
- S. Trippel, T. Mullins, N.L.M. Müller, J.S. Kienitz, J.J. Omiste, H. Stapelfeldt, **R. González-Férez**, & J. Küpper, *Strongly driven quantum pendulum of the carbonyl sulfide molecule*, Physical Review A **89**, 051401(R) (2014). (26 citations WOS).
- **R. González-Férez** & C.P. Koch, *Enhancing photoassociation rates by nonresonant-light control of shape resonances*, Physical Review A **86**, 063420 (2012) (24 citations WOS).
- J.H. Nielsen, H. Stapelfeldt, J. Küpper, B. Friedrich, J.J. Omiste & **R. González-Férez**, *Making the Best of Mixed-Field Orientation of Polar Molecules: A Recipe for Achieving Adiabatic Dynamics in an Electrostatic Field Combined with Laser Pulses*, Physical Review Letters **108**, 193001 (2012). (44 citations WOS).

C.2. Research projects and grants

- Nolinealidad, Control e Incertidumbre Cuánticas. Project FIS2017-89349-P, Ministerio de Economía y Competitividad (Spain). PI: **Dr. R. González-Férez**. Duration: 2018 – 2020.
- Control de Sistemas Cuánticos. Project FIS2014-54497-P, Ministerio de Economía y Competitividad (Spain). PI: **Dr. R. González-Férez**. Duration: 2015 – 2017.
- Teoría de la Aproximación, Funciones Especiales y Modelos Matemáticos: de la Teoría a las Aplicaciones Oftalmológicas. Excellence Research Project P11-FQM-7276, Junta de Andalucía (Spain). PI: Prof. A. Martínez-Finkelshtein. Duration: 30/04/2013-29/04/2017
- COHERENCE-Cooperativity in Highly Excited Rydberg Ensembles - Control and Entanglement. Project n. 265031 FP7-PEOPLE-2010-ITN, Marie Curie Actions Initial Training Networks, European Union. PI Universidad de Granada: **Dr. R. González-Férez**, PI: Prof. M. Weidemüller (Universität Heidelberg). Duration: 09/1/2011 – 08/31/2015
- Física de la Información, Sistemas Ultrafríos y Nolinealidad. Aplicaciones Multidisciplinares. Project FIS2011-24540, Ministerio de Ciencia e Innovación (Spain). PI: Prof. J. Sánchez-Dehesa. Duration: 2012 - 2014
- Moléculas ultrafrías en campos electromagnéticos externos, Project PYR-2010-16. Campus of International Excellence CEI BioTIC GENIL (CEB09-0010), Universidad de Granada. PI: **Dr. R. González-Férez**. Duration: 01/01/2011 – 12/31/2011

C.3. Contracts

C.4. Patents

C.5 PhD Students

- Pablo Sánchez Moreno (FPU), 2-18-2008, *Medidas de información de funciones especiales y sistemas mecano-cuánticos, y dinámica molecular en campos eléctricos homogéneos dependientes del tiempo*. Supervisors: J. S. Dehesa, **R. González-Férez** and R.J. Yáñez
- Beatriz Olmos Sánchez (FPU), 3-22-2010, *Information measures of quantum system and Collective Rydberg excitations of an atomic gas confined in a ring lattice*. Supervisors: J. S. Dehesa, **R. González-Férez** and I. Lesanovsky
- Juan J. Omiste Romero (FPU), 15-7-2013, *Interaction of rotationally cold molecules with external fields*. Supervisor: **R. González-Férez**
- Javier Aguilera Rodríguez (scholarship EU ITN COHERENCE), 12-1-2018, *Ultralong-range Rydberg Molecules*. Supervisor: **R. González-Férez**
- Linda V. Thesing (University of Hamburg, Hamburg, Germany), 2-21-2020, *Alignment and orientation of complex molecules*. Supervisors: **R. González-Férez** and J. Küpper

C.6 Invited talks and seminars

During the last 10 years, I have given 35 invited talks at international conferences and workshops on AMO physics, and more than 25 seminars at universities and research centers. A selection of my invited talks in the last 10 years:

- International Meeting on Atomic and Molecular Physics and Chemistry 2011, Rennes (France), July 2011.
- The 21st International Conference on Laser Spectroscopy, Berkeley (USA), June 2013.
- European Group on Atomic Systems (EGAS) conference, Lille (France), July 2014.
- Cold and Controlled Molecules and Ions Conference, Monte Verita (Switzerland), Sep. 2014.
- XXIX International Conference on Photonic, Electronic, and Atomic Collisions (ICPEAC), Toledo (Spain), July 2015.
- 47th Annual Meeting of the Division of Atomic, Molecular, and Optical Physics - DAMOP 2016, Providence (USA), June 2016.
- 11th Congress on Electronic Structure: Principles and Applications (ESPA 2018), Toledo (Spain), July 2018.

- 10th International Meeting on Photodynamics and Related Aspects, Cartagena, (Colombia), September 2018.
- 10th Congress of the International Society of Theoretical Chemical Physics (ISTCP-X) Tromsø (Norway), July 2019.
- Discussion Leader, GRC Quantum Control of Light and Matter, Newport (USA), Aug. 2019.

C.7 Organization of Workshops and Conferences

- Special Functions, Information Theory and Mathematical Physics. An interdisciplinary conference in honor of Prof. J. S. Dehesa's 60th birthday 9/17-19/2007, Granada
- Interdisciplinary Workshop on Nonlinear Schrödinger Equations and Applications: Modeling, Mathematical Analysis, Computation & Experiment, 10/8-10/2011, Granada
- Cold and Ultracold Molecules Workshop, 11/4-6/2013, Granada
- YEA meeting and Idea Factory, 9/8-9/2014, Granada
- Ultracold Rydberg Physics Workshop, 9/10-12/2014, Granada
- Third International Workshop on Ultracold Rydberg Physics, Recife, Brazil, 12/02-05/2018.
- Summer School Series on Quantum Matter 2011, 2013, 2015, 2017 and 2019, Granada

C.8 Scientific committees

- Member of the Scientific Panel of the conference series on Cold and Controlled Molecules and Ions 2012, 2014, 2016, 2018, 2020.
- Member of scientific committee the final conference of the ITN COHERENCE, 06/28 to 07/03, 2015, Durham (UK).
- Member of the Ultracold Quantum Matter and Quantum Simulation subcommittee of the CLEO/Europe-EQEC 2017 and 2019.
- Member of the Commission on Atomic, Molecular and Optical Physics (C.15) of the International Union of Pure and Applied Physics (IUPAP) for the term 2018 – 2020.
- Member of the board of the Atomic, Molecular and Optical Physics Division (AMOPD) of the European Physical Society (EPS) since July 2018.
- Member of the board of the European Group of Atomic Systems (EGAS) of the European Physical Society (EPS) since July 2017.
- Chair of the board of European Group of Atomic Systems EGAS since July 2018.

C.9 Institutional responsibilities at the Universidad de Granada

- Academic Coordinator of the Master Program in Physics and Mathematics, 10/25/2012 to 5/29/2017.
- Member of the academic commission of the PhD Program in Physics and Mathematics since 10-1-2013.
- Member of the academic commission of the Physics BsC., since 2018.
- Erasmus Coordinator of the Double Degree in Physics and Mathematics, since 2018.
- Member of Consejo de Dirección, Instituto Carlos I de Física Teórica y Computacional (IC1)
- Coordinator of the research group Física Cuántica y Física Matemática of the IC1

C.10 Editorial Board

- Guest editor in the Journal of Physics B: Atomic, Molecular and Optical Physics, Special Issue on Interacting Rydberg Atoms
- Editor of the *IOP SciNotes*.

C.11 Awards and Honors

- Special Mention with Honors in the studies B. Sc. in Physics, Spain, 1996.
- "Award for Excellence" in Ph.D. in Physics (2000-2001). University of Granada.
- Alexander von Humboldt Foundation Postdoctoral Scholarship 04/2002 to 01/2004.
- Fulbright fellowship at Harvard University, 03/2020 to 07/2020
- The Mildred Dresselhaus Award for Young Scientists 2013 (first recipient) of The Hamburg Center for Ultrafast Imaging, Universität Hamburg, Hamburg (Germany).

Parte A. DATOS PERSONALES		Fecha del CVA	16/10/2019
Nombre y apellidos	Jose Ramón Peláez Sagredo		
DNI/NIE/pasaporte		Edad	
Núm. identificación del investigador	Researcher ID	M-7687-2019	
	Código Orcid	http://orcid.org/0000-0003-0737-4681	

A.1. Situación profesional actual

Organismo	Universidad Complutense		
Dpto./Centro	Departamento de Física Teórica . Facultad de CC. Físicas		
Dirección	Plaza de las Ciencias 1, 28040 Madrid		
Teléfono	913945188	correo electrónico	jrpelaez@fis.ucm.es
Categoría profesional	Catedrático de Universidad	Fecha inicio	22/8/2016
Espec. cód. UNESCO	2212, 221202, 221208, 221212		
Palabras clave	Física Teórica, Física de Partículas, Física Hadrónica		

A.2. Formación académica (título, institución, fecha)

<i>Licenciatura/Grado/Doctorado</i>	<i>Universidad</i>	<i>Año</i>
Doctorado en Física Teórica y Matemática	Complutense de Madrid	1995
Licenciado en Ciencias Físicas	Complutense de Madrid	1991
Licenciado en Matemáticas	Complutense de Madrid	1995

A.3. Indicadores generales de calidad de la producción científica

- **Sexenios reconocidos de investigación: 4** de 4 posibles: 92-97, 98-03, 04-09, 10-15
- Tesis doctorales dirigidas en los 10 últimos años: **5** (todas dirigidas en solitario). Dos de ellas premio Extraordinario y otra a la espera de la resolución.
- Según la base de datos de inSPIRE: Índice **h=36**
<https://inspirehep.net/literature?sort=mostrecent&size=25&page=1&q=find%20a%20pelaez%2C%20j.%20r.&ui-citation-summary=true>
 Más de 185 trabajos (artículos, actas, libros, etc...) que han recibido **más de 6740 citas**. De ellos 87 publicados en revistas internacionales, los cuales han recibido más de 6150 citas. Destacan: uno con más de 500 citas, otros 6 con más de más de 250, otros 9 con más de 100 y otros 15 con más de 50.
- Según la Web of Science (<https://publons.com/researcher/M-7687-2019/>). 140 documentos con más de 4800 citas e índice-h=34
- Publicación en solitario y por invitación de un Physics Reports 658 (2016) 1 -111.

Parte B. RESUMEN LIBRE DEL CURRÍCULUM (máximo 3500 caracteres, incluyendo espacios en blanco)

Intereses y logros Científicos

Principalmente dedicada a la Física Hadrónica, mi investigación cubre también aspectos de QCD, del sector de Higgs, violación de CP, e incluso supergravedad para modelos inflacionarios de Cosmología. Mi actividad principal se centra en los mesones a baja energía, usando Teorías Efectivas y/o técnicas dispersivas. Mis trabajos han sido relevantes para establecer la existencia, propiedades y clasificación de los mesones ligeros a partir de datos, simetría quiral, unitariedad y analiticidad. El conjunto de estas técnicas englobadas en la “Teoría de Perturbaciones Quiral Unitarizada”, recibida con escepticismo, es hoy día una técnica estándar para el estudio de mesones, bariones o incluso Física más allá del Modelo Estándar. Gran atención ha recibido también el estudio de la dependencia de los hadrones con parámetros de QCD como la masa de los quarks o el número de colores. Finalmente, mi grupo ha contribuido decisivamente a la revisión radical en el Review of Particle Properties de las propiedades del mesón σ o $f_0(500)$, responsable en gran medida de la atracción nuclear, y del mesón κ o $K_0^*(700)$, que es su compañero con extrañeza.

Trayectoria Académica

Catedrático en la UCM desde 22/8/2016. (Acreditado en 01/2009). Profesor titular en la UCM desde 03/2003. Director del Depto. de Física Teórica desde 1/2/2018. Director del Depto. de Física Teórica II 11/2015 a 11/2017. Investigador Principal de la Red Nacional de Excelencia “Física Hadrónica”. FIS2014-57026-REDT, vigente en 2015-16.

Beuario Doctoral UCM (4/92-2/93), Profesor Ayudante (UCM 2/93-31/01), Beca postdoctoral “Jaime del Amo” en el Lawrence Berkeley National Laboratory, (10/95-9/96), Beca postdoctoral Ministerio de Educación en el Stanford Linear Accelerator Centre, (2/98-12/98), Profesor Asociado (UCM 1/02-8/03), Marie Curie European Fellow (2/02-2/03) en la Universidad de Florencia e INFN, Italia.

Publicaciones

Según inSPIRE: Más de 185 trabajos (artículos, actas, libros, etc...) que han recibido **más de 6740 citas**. De ellos 87 publicados en revistas internacionales, los cuales han recibido más de 5890 citas. Destacan: uno con más de 500 citas, otros 6 con más de 250, otros 9 con más de 100 y otros 15 con más de 50.

Con A.Dobado, A.Gómez Nicola y A.L.Maroto, coautor del **libro** *Effective Lagrangians for the Standard Model. Texts and Monographs in Physics*, Springer-Verlag, Berlin 1997 (ISBN 3-540-62570-4). Coeditor del **libro**: *The IX International Conference on Quark Confinement and the Hadron Spectrum*. F.J.Llanes Estrada y J.R.Peláez. *American Inst. of Physics Conf. Procs.* 1343, New York 2011 (ISBN 978-0-7354-0899-9).

Autor en solitario y por invitación del *Physics Reports* 658 (2016) 1–111, de 111 páginas. Otro invitado como coautor con A. Rodas, recientemente enviado a *Phys. Rept.*

Conferencias, Congresos

Orador: Más de 90 charlas en conferencias internacionales, 61 de ellas invitadas y de ellas 13 plenarios.

Chairman: *9th Int. Conf. on Quark Confinement and the Hadron Spectrum*, UCM 2010, *Quark Masses and Hadron Physics*, UCM 2009.

Comité organizador: *Chiral10 Workshop*, Valencia 2010, *Jornadas HADRONet Barcelona 2016*, *IVth Int. Conf. on Quark and Nuclear Physics*, UCM 2006. XVII Int.Conf. Hadron Spectroscopy and Structure HADRON2017-Salamanca.

International Advisory Committee: Miembro en 14 conferencias o workshops internacionales. 44 seminarios invitados en Universidades y Laboratorios.

Escuelas de posgrado

Coorganizador del X Taller de Altas Energías (UCM 7/2012). Profesor en: 2017 Int. Summer Workshop on Reaction Theory, U. Indiana, 6-2017, School on Concepts of Modern Amplitude Analysis Techniques (Mainz Helmholtz Institute, 2013), School of the Int. Workshop on Partial Wave Analysis (Institute of High Energy Physics, Pekín, 2012), School on amplitude analysis in modern physics (Physikzentrum Bad Honnef, 2011) y en un Curso sobre Teoría de Perturbaciones Quiral (U. Santiago, 1997).

Docencia: 5 quinquenios. 37,5 grupos en 7 asignaturas de Licenciatura, Grado o Máster y 4 de Doctorado. Puntuación sobre 10 en encuestas Docencia en los últimos 4 años a la pregunta “En mi opinión es un buen profesor”: 10, 8,42, 9.6, 9.32, 9.55, 9.19, 9.52, 8.44 y 9.5. 10 participaciones en programa completo Docencia 5 “positivas” y 5 “muy positivas”

Parte C. MÉRITOS MÁS RELEVANTES (ordenados por tipología)

C.1. Publicaciones: *Usualmente, en mi área el orden de firma es ALFABÉTICO* en publicaciones en revistas y en actas de congresos el orador firma en primer lugar.

Selección de 5 trabajos de los últimos 10 años:

1) J.R. Peláez and A. Rodas, *Determination of the lightest strange resonance $K_0^*(700)$ or κ , from a dispersive data analysis*. *Phys.Rev.Lett.* **124 (2020) 17, 172001**.

Citations WoS: 2. Citations InSPIRE: 12

2) J.R. Peláez, *From controversy to precision on the sigma meson: a review on the status of the non-ordinary $f_0(500)$ resonance*. *Physics Reports* **658 (2016) 1 -111**, e-Print: 1510.00653 [hep-ph] Citations WoS: 137. InSPIRE: 277

- 3) J. C. Berengut, E. Epelbaum, V. V. Flambaum, C. Hanhart, U.-G. Meissner, J. Nebreda y J. R. Pelaez, *Varying the light quark mass: impact on the nuclear force and Big Bang nucleosynthesis*. **Phys.Rev. D87 (2013) no.8, 085018**. Citations WoS: 68. InSPIRE: 72
- 4) R. García- Martin, R.Kaminski, J.R. Peláez, J.Ruiz de Elvira, F.J. Yndurain. *The pion-pion scattering amplitude. IV: Improved analysis with once subtracted Roy-like equations up to 1100 MeV*. **Phys. Rev. D83, 074004 (2011)**. Citations WoS: 236. InSPIRE: 356
- 5) R.Garcia- Martin, R.Kaminski, J.R. Pelaez, J.Ruiz de Elvira. Precise determination of the $f_0(600)$ and $f_0(980)$ pole parameters from a dispersive data analysis. **Phys.Rev.Lett. 107 (2011) 072001**. Citations WoS: 136. InSPIRE: 214

Selección de otros 5 artículos especialmente destacados:

- 6) J.R. Pelaez, G. Ríos. *Nature of the $f_0(600)$ from its $N(c)$ dependence at two loops in unitarized Chiral Perturbation Theory*. **Phys.Rev.Lett.97:242002, 2006**. Citations WoS: 192. InSPIRE: 246
- 7) J.R.Peláez. *Nature of light scalar mesons from their large- N_c behavior* **Phys.Rev.Lett. 92,10, 2004**. Citations WoS: 255. InSPIRE: 320
- 8) J. A. Oller, E. Oset y J. R. Peláez. *Meson-meson interaction in a non-perturbative chiral approach*. **Phys.Rev.D59, 074001, 1999**. Citations WoS: 546. InSPIRE: 693
- 9) J. A. Oller, E. Oset y J. R. Peláez. *Non-perturbative Approach to effective chiral Lagrangians and Meson Interactions*. **Phys. Rev. Lett. 80, 3452-3455, 1998**. Citations WoS: 298. InSPIRE: 366
- 10) A. Dobado y J.R. Peláez. *The inverse amplitude method in Chiral Perturbation Theory*. **Phys. Rev. D56, 3057-3073, 1998**. Citations WoS: 261. InSPIRE: 364

**C.2. Proyectos
Como Investigador Principal**

- 1) TÍTULO DEL PROYECTO: Hadron Physics and Quantum Chromodynamics: From low energies to LHC. PID2019-106080GB-C21
ENTIDAD FINANCIADORA: Ministerio de Ciencia e Innovación.
DURACION DESDE: 01/01/2020 HASTA: 31/12/2020
INVESTIGADORES PRINCIPALES: J.R. Peláez e I. Scimemi CANTIDAD: 107.000 €
- 2) TÍTULO DEL PROYECTO: Hadron Physics and Quantum Chromodynamics: From low energies to LHC. FPA2016-75654-C2-2-P
ENTIDAD FINANCIADORA: Ministerio de Ciencia e Innovación.
DURACION DESDE: 30/12/2016 HASTA: 29/12/2019
INVESTIGADORES PRINCIPALES: J.R. Peláez e I. Scimemi CANTIDAD: 80.000 €
- 2) Hadron Physics and Quantum Chromodynamics: From low energies to LHC. FPA2014-53375-C2-2
ENTIDAD FINANCIADORA: Ministerio de Ciencia e Innovación.
DURACION DESDE: 1/1/2012 HASTA: 30/06/2015
INVESTIGADORES PRINCIPALES: A. Gómez Nicola y J.R. Peláez CANTIDAD: 67.000 €
- 3) Hadron Physics and Quantum Chromodynamics: From low energies to LHC. FPA2011-27853-C02-02
ENTIDAD FINANCIADORA: Ministerio de Ciencia e Innovación.
DURACION DESDE: 1/1/2012 HASTA: 31/12/2014
INVESTIGADOR PRINCIPAL: J.R. Peláez CANTIDAD: 120.000 €
- 4) Red de Excelencia “Física Hadrónica”. FIS2014-57026-REDT

ENTIDAD FINANCIADORA: Ministerio de Economía y Competitividad
DURACION DESDE: 1/12/2014 HASTA: 30/11/2016
INVESTIGADOR PRINCIPAL: J.R. Peláez CANTIDAD: 20.000 €

5) Estudio de los mesones escalares ligeros y sus implicaciones sobre el Principio Antrópico FPA2007-29115-E/
ENTIDAD FINANCIADORA: Ministerio de Educación y Ciencia. Programa EXPLORA
DURACION DESDE: 1/1/2008 HASTA: 30/06/2009
INVESTIGADOR PRINCIPAL: J.R. Peláez CANTIDAD: 21.200 €

De programas de la Unión Europea:

1) J.R.Peláez and I. Scimemi como responsables del nodo UCM de los Working Packages 25-JRA7 y WP22-JRA4 del “Horizon 2020 research and innovation programme: Strong 2020” (Grant Agreement No. 82409) (2019-2023). 27.000 €

2) Responsable del nodo UCM del FP7 Working Packages of the HadronPhysics3 (2012-2014) y HadronPhysics2 (2008-2012) (Grant Agreements 283286 and 227431)

Como miembro investigador de proyectos nacionales de investigación

6) Aplicaciones De Las Teorías Efectivas Modernas. FPA2008-00592/FPA
ENTIDAD FINANCIADORA: CICYT
DURACION DESDE: 01/01/2009 HASTA: 31/12/2011
INVESTIGADOR PRINCIPAL: A. Dobado CANTIDAD: 168.500 €

7) Aplicaciones De Teorías Efectivas En Física De Partículas. FPA2005-02327
ENTIDAD FINANCIADORA: CICYT
DURACION DESDE: 15/10/2005 HASTA: 14/10/2008
INVESTIGADOR PRINCIPAL: A. Dobado CANTIDAD: 90.000 €

8) Física Nuclear y de hadrones a energías intermedias. FIS2006-03438
ENTIDAD FINANCIADORA: Ministerio de Educación y Ciencia
DURACION DESDE: 1/10/2006 HASTA: 30/09/2011
INVESTIGADOR PRINCIPAL: E. Oset CANTIDAD: 422.290 €

C.3. Contratos, méritos tecnológicos o de transferencia C.4. Patentes

C.5. Premios: Premio de doctorado de la Real Academia de Doctores, Sección de Ciencias, año 1995. Premio Extraordinario de Doctorado. Facultad de CC. Físicas. UCM. Año 1996.

C.6. Referee Outstanding referee de la American Physical Society 2015. Certificate of Outstanding Contribution in Reviewing-Phys.Lett.B-11/2017. Miembro del “Editorial Board” de *Scientific Reports (Nature Publishing)*. Revisor de revistas internacionales: Physical Review Letters, Nuclear Phys. A y B, Phys. Rev. D y C, Eur. Phys. Jour. A, C and Special Topics, Phys. Lett. B, Advances in High Energy Physics and SciPost.

C.7. Evaluador de proyectos y programas de investigación.

En España: Para la Agencia Nacional de Evaluación de Proyectos (ANEP, 2009, 2010, 2014 y 2020). Para la ANEP de los programas de contratos posdoctorales “Ramón y Cajal” 2008 y “Juan de la Cierva” 2008, 2010 y 2021.

En otros países: Para la National Science Foundation, USA y la Swiss National Science Foundation. Para la Comisión Nacional de Investigación Científica (CONICYT) de Chile en 2011. Para el banco de evaluadores del FONCyT, convocatorias PICT-2011 y PICT-2013, de la Agencia Nacional de Promoción Científica y Tecnológica del Ministerio de Ciencia, Tecnología e Innovación Productiva de la *República de Argentina*. Para la State University of New York Chancellor Award of Excellence 2008 y la Fonds Wetenschappelijk Onderzoek-Vlaanderen, de Bélgica 2018 y la “Evaluation of the Institutes of the Czech Academy of Sciences (CAS) en 2015.

Part A. PERSONAL INFORMATION

CV date

February 26, 2021

First and Family name	Juan M Nieves Pamplona		
Passport, ID number		Age	
Researcher codes	Open Researcher and Contributor ID (ORCID**)	0000-0002-2518-4606	
	SCOPUS Author ID (*)	15846146700	
	WoS Researcher ID (*)	K-2115-2014	

(*) *Optional*

(**) *Mandatory*

A.1. Current position

University/Institution	Spanish Research Council (CSIC)		
Department	Instituto de Física Corpuscular (IFIC)		
Address and Country	Catedrático José Beltrán, 2 46980 Paterna (Valencia), Spain		
Phone number	+34 963543527	E-mail	jmnieves@ific.uv.es
Current position	Investigador Científico (Senior Researcher)	From	May 19, 2008
Key words	Hadron and nuclear physics at intermediate energies, neutrino-nucleus interactions, chiral and heavy-quark effective theories, low energy QCD, non- perturbative methods, exotic hadrons, etc...		

A.2. Education

PhD, Licensed, Graduate	University	Year
Theoretical Physics	University of Valencia	1988
PhD in Theoretical Physics	University of Valencia	1992

A.3. General indicators of quality of scientific production

FIVE research periods (1989-2018) positively evaluated. NINE PhD theses supervised, FIVE of them since 2010. WoS (Clarivate Analytics): 7565 citations, average of more than 600 citations/year in the last five years and index $h=49$. Around 175 papers in the first quartile (Q1), without considering proceedings. In the basis iNSPIRE (High Energy Physics, <https://inspirehep.net/?ln=en>) the number of citations is higher, above 10300, with index $h= 57$.

Part B. CV SUMMARY (max. 3500 characters, including spaces)

PhD in Theoretical Physics 1989-92 at U. Valencia (excellence award, FPU-fellowship 1989-92), EU postdoctoral grant and contract at U. Southampton (1993-95), Lecturer at U. Granada (1995) and CSIC researcher (IFIC) since 2008.

FIVE research periods (sexenios), DIRECTOR of 9 PhD theses and positively evaluated (ANECA) for Full Professor (2008). Large teaching experience in Degree, Master and PhD courses, including programs granted with the excellence mention. HEAD of IFIC Theory Department (2013-17) and DIRECTOR of the IFIC CSIC group "*EFTs in hadron and nuclear physics*" since 2019. PI of FIVE projects of the Spanish National Plan (2003-05, 2006-08, 2012-15, 2015-17 and 2018-), of ONE excellence project of the Valencian Generalitat (2020-23), and Work-Package co-spokesperson of an EU H2020-INFRAIA-2018 project (2019-23).

Member of the *Theory Advisory Group of the PANDA detector (FAIR)*. Referee for several Research Evaluation Agencies --ANEP (Spain), European Research Council, AGAUR (Catalunya), ACSUCYL (Castilla y León), Deutsche Forschungsgemeinschaft (Germany), Croatian Science Foundation, FONDECYT-CONICYT (Chile), ANPCyT (Argentina) and The Research Foundation--Flanders (Belgium)--, and for several journals (Nucl. Phys. A and B, Phys. Lett. B, JHEP, Phys. Rev. C and D, Phys. Rev. Lett., Annals of Physics, Eur. Phys. Jour. A and C, Jour. Phys. A and G,...).

Organization of 8 International Conferences: *Resonances in QCD* (ECT*, 2005), *Hadron Dynamics* (Almuñecar, 2008), *Chiral 2010* (IFIC), *Nstar 2013* (Peñíscola), *Hadron Spanish*



Network Days and Spanish-Japanese JSPS Workshop (IFIC, 2015), *The Charm and Beauty of Strong Interactions* (ECT*, 2017), *Neutrino and Nuclei, challenges and opportunities for nuclear theory* (ECT*, 2019) and *Theoretical aspects of Hadron Spectroscopy and Phenomenology* (IFIC, 2020). CONVENER of the workshop-series NuFacT (2009, 2010, 2011), Nulnt (2012, 2015) and HADRON (2017).

Research: QCD is adequate to study processes that involve energy-moment transfers much greater than the confinement scale. In this regime, the interactions between quarks and gluons are weak and it is possible to use perturbative techniques. My research focuses on the study of processes at low energies, where perturbative QCD cannot be used. A first objective is to understand how quarks and gluons conspire to produce the great diversity of low energy hadronic processes. The second objective is to describe the interactions between hadrons inside of a nucleus. Both objectives are complementary. Even if QCD were resolved exactly in the vacuum, it would still be necessary to understand how hadronic processes are modified in a nuclear environment. On the other hand, although using phenomenological models in the free space, one would find a satisfactory description of reactions involving nuclei, it would still be necessary to describe these phenomenological interactions in terms of QCD. I have studied properties of different heavy hadrons, including exotic states, using lattice QCD, constituent quark models and effective unitary theories based on heavy-quark flavor and spin symmetries. In the light sector I have worked with unitary extensions of ChPT and studied the limit of large number of colors. I have also studied the pion-nucleus interaction from threshold to the $\Delta(1232)$ resonance and the inclusive and exclusive nuclear responses to electroweak probes, paying special attention to reactions of interest in neutrino-oscillations experiments.

Part C. RELEVANT MERITS

C.1. Publications (10 most cited publications from WoS in the 2011-2021 period)

1. NuSTEC White Paper: Status and challenges of neutrino-nucleus scattering, Alvarez-Ruso, L. et al., PROGRESS IN PARTICLE AND NUCLEAR PHYSICS 100 (2018) pages: 1-68. [93 citations]
2. LHCb pentaquark as a $\bar{D}^* \Sigma_c - \bar{D}^* \Sigma_c^*$ molecular state, Roca, L.; Nieves, J.; Oset, E.; PHYSICAL REVIEW D92 (2015) 094003-6 pages. [156 citations]
3. Progress and open questions in the physics of neutrino cross sections at intermediate energies, Alvarez-Ruso, L.; Hayato, Y.; Nieves, J; NEW JOURNAL OF PHYSICS 16 (2014) 075015-62 pages. [81 citations]
4. Consequences of heavy-quark symmetries for hadronic molecules, Guo, F.-K.; Hidalgo-Duque, C; Nieves, J.; Valderrama-Pavón, M.; PHYSICAL REVIEW D88 (2013) 054007 -5 pages. [152 citations]
5. Combining heavy quark spin and local hidden gauge symmetries in the dynamical generation of hidden charm baryons, Xiao, C.W.; Nieves, J.; Oset, E.; PHYSICAL REVIEW D88 (2013) 056012-20 pages. [113 citations]
6. Neutrino-nucleus quasi-elastic and 2p2h interactions up to 10 GeV, Gran, R.; Nieves, J.; Sanchez, F; Vicente-Vacas, M. J.; PHYSICAL REVIEW D88 (2013) 113007-10 pages. [102 citations]
7. The nucleon axial mass and the MiniBooNE quasielastic neutrino-nucleus scattering problem, Nieves, J.; Ruiz-Simo, I.; Vicente-Vacas, M. J.; PHYSICS LETTERS B707 (2012) pages: 72-75. [156 citations]
8. Neutrino energy reconstruction and the shape of the charged current quasielastic-like total cross section, Nieves, J.; Sanchez, F.; Ruiz-Simo, I; Vicente-Vacas, M.J.; PHYSICAL REVIEW D85 (2012) 113008 -9 pages. [77 citations]



9. Heavy quark spin symmetry partners of the X(3872), Nieves, J.; Valderrama-Pavón, M.; PHYSICAL REVIEW D86 (2012) 056004-18 pages. [107 citations]
10. Inclusive charged-current neutrino-nucleus reactions, Nieves, J.; Ruiz-Simo, I.; Vicente-Vacas, M. J.; PHYSICAL REVIEW C83 (2011) 045501-19 pages. [194 citations]

C.2. Research projects

Title: Effective field theories in hadron and nuclear physics.

Funding Agency: Generalitat Valenciana, PROMETEO/2020/023 (excellence groups)

Period & Centre: January 2020 – December 2023 & IFIC (Universidad de Valencia & CSIC)

Budget: 250363 €. Principal Researcher: J. Nieves

Title: Light-and heavy-quark hadron spectroscopy

Funding Agency: EU H2020-INFRAIA-2018-1. Work Package 25 of project STRONG-2020, proposal number 824093

Period: June 2019 - May 2023

Budget: 429875€. Principal Researchers: J. Nieves & M. Battaglieri (INFN). Coordinator of STRONG-2020: B. Erazmus (CNRS)

Title: Effective Theories in Hadron and Nuclear Physics.

Funding Agency: Spanish Research Agency and FEDER funds, FIS2017-84038-C2-1-P

Period: January 2018 - September 2021

Budget: 85000 € (direct costs) + 1 PhD fellowship

Principal Researcher: J. Nieves (Co-PI L. Alvarez-Ruso)

Title: Effective Theories in Hadron and Nuclear Physics.

Funding Agency: Spanish Research Agency and FEDER funds, FIS2014-51948-C2-1-P

Period: January 2015 - June 2018

Budget: 132000 € (direct costs) + 1 PhD fellowship

Principal Researcher: J. Nieves (Co-PI L. Alvarez-Ruso)

Title: Effective Theories in Hadron and Nuclear Physics.

Funding Agency: Spanish Research Agency, FIS2011-28853-C02-02

Period: January 2012 – December 2015

Budget: 135000 € (direct costs). Principal Researcher: J. Nieves.

Title: Study of Strongly Interacting Matter.

Funding Agency: EU FP7 Programme: European Community-Research Infrastructure Integrating Activity, contracts number 227431 and 283286.

Period: January 2009 – December 2014

Budget: 160000 € (Valencia node)

Principal Researcher: U. Meißner (Bonn–Jülich).

Title: Hadron and Nuclear Physics at Intermediate Energies.

Funding Agency: Generalitat Valenciana, PROMETEO/2009/0090 and PROMETEOII/2014/0068

Period: January 2009 – December 2017

Budget: 465000 €. Principal Researcher: E. Oset (U. Valencia)

Title: Hadron Physics.

Funding Agency: Spanish Research Agency and FEDER funds, FIS2014-57026-REDT (networks of excellence)

Period: January 2015 - December 2016

Budget: 20000 € (direct costs)

Principal Researchers: J.R. Peláez, A. Parreño, J.A. Oller, C. García-Recio, D. Rodríguez Entem, J. Nieves.



C.3. Contracts, technological or transfer merits

C.4. Patents

C.5 TALKS (Last talks given personally at International Conferences). My collaborators and I have given about 250 talks at Int. Conferences, 70 of them given by me.

Light-and heavy-quark hadron spectroscopy, 'STRONG-2020: The strong interaction at the frontier of knowledge: fundamental research and applications, Kick-off meeting', Nantes (France), October 2019 (invited talk).

Open-and hidden-charm meson spectroscopy, 'Implications of LHCb measurements and future prospects', CERN (Switzerland), October 2019 (invited talk).

Weak pion production off nucleons and nuclei, 'Workshop on Neutrino-Nucleus Pion Production in the Resonance Region', Pittsburgh (USA), October 2019 (invited talk).

Theoretical review of heavy-light spectroscopy, '18th International Conference on Hadron Spectroscopy and Structure (HADRON2019)', Guilin (China), August 2019 (invited talk).

Theoretical interpretation of some even parity Quarkonium XYZ states, open heavy flavor mesons and odd parity doubly charmed baryons, 'Workshop on the Physics of HL-LHC and perspectives at HE-LHC', CERN (Switzerland), June 2018 (invited talk).

Neutrino cross sections vs systematics, 'Neutrino Platform Week', CERN (Switzerland), January 2018 (invited talk).

Theory developments in neutrino cross sections, 'NuPhys2017: Prospects in Neutrino Physics', London (UK), December 2017 (invited talk).

Theoretical challenges in neutrino scattering studies: weak pion production off the nucleon, 'Workshop on neutrino-nucleus interactions in the few GeV region', KEK Theory Center, Tokai campus (Japan), November 2017 (invited talk).

Theoretical interpretation of the X, Y, Z states, '3rd Resonance Workshop', Bergamo (Italy), October 2017 (invited talk).

Two pole structure of the $D_0^(2400)$* , 'The Charm and Beauty of Strong Interactions', ECT*, Trento (Italy), July 2017 (invited talk).

Nuclear Effects in Pion Production in the resonance region, 'NuInt17, 11th International Workshop on Neutrino-Nucleus Interaction in the Few GeV Region', Toronto (Canada) June 2017 (invited talk).

Electro-and neutrino-nucleus interactions at intermediate energies, 'IPPP/NuSTECtopical meeting on neutrino-nucleus scattering', Durham (UK), April 2017 (invited talk).

Theory of neutrino cross sections, 'XVII International Workshop on Neutrino Telescopes', Venice (Italy), March 2017 (invited talk).

QE-like scattering and neutrino energy reconstruction, 'NOW 2016, 9th Neutrino Oscillation Workshop', Otranto (Italy), September 2016 (invited talk).

Theoretical challenges in neutrino scattering studies, 'Neutrino 2016: XXVII International Conference on Neutrino Physics and Astrophysics', London (UK), July 2016 (invited talk).



Part A. PERSONAL INFORMATION		CV date		17/01/2021
First and Family name	Blanca Biel Ruiz			
Social Security, Passport, ID number		Age		
Researcher numbers	Researcher ID	C-5296-2009		
	Orcid code	0000-0003-0574-1214		

A.1. Current position

Name of University/Institution	Universidad de Granada		
Department	Física Atómica, Molecular y Nuclear		
Address and Country	Campus de Fuente Nueva, s/n 18071		
Phone number	+34686047639	E-mail	biel@ugr.es
Current position	Profesor Titular de Universidad (Associate Professor)	From	04/10/2019
Espec. cód. UNESCO	220306; 221100; 330000		
Palabras clave	Density Functional Theory; electronic transport; 2D materials; SPM characterization; defects; molecules; biomaterials		

A.2. Education

PhD	University	Year
Bachelor of Science (Physics)	University of Granada	1999
PhD in Physics	Autonomous University of Madrid (Madrid, Spain)	2006

A.3. JCR articles, h Index, thesis supervised...

Journal publications in JCR journals: **27**

Total citations (WoS, January 2021): **1620+**

Average citations per article: **49+**

Average citations per year (last 5 years): **100+**

h-index: **16**

Communications in international conferences: **40+** (approx.). Invited: **5**

Number of citations in last 5 years (2016 - 2020): **600+**

Six-year term research evaluation ('*sexenio*'): **2** (2002-2008; 2009-2014; 2015-2020 under evaluation)

Part B. CV SUMMARY (max. 3500 characters, including spaces)

I graduated in Physics from the University of Granada in 1999. Since the beginning of my scientific career my research has been devoted to the application of *ab initio* methods (based on Density Functional Theory) and other atomic-scale tools to the study of transport properties in nanostructures. I obtained my doctorate from the Autonomous University of Madrid with a thesis on *ab initio* simulations on semiconductor surfaces III-V and charge transport in carbon nanotubes, receiving the Outstanding PhD Award. My thesis work with nanotubes was pioneering in the application of DFT techniques and formalism of Non Equilibrium Green Functions (NEGFs) for the study of electronic transport at the mesoscopic scale. I completed a two-year postdoctoral stay at CEA-LETI, where I collaborated with the experimental groups in the design of a transistor based on doped graphene nanoribbons, developing tight-binding tools based on DFT that allow for a decrease in calculation time with DFT precision. In 2009 I joined the University of Granada within the "Juan de la Cierva" national grant scheme and in 2014 I received a Ramón y Cajal Research Fellowship. Since October 2019 I am an Associated Professor at the Atomic, Molecular and Nuclear Physics department of the University of Granada.

At present, my research focuses mostly on the study of the electronic and transport properties of realistic (i.e., in the presence of strain, defects, or substrates) 2D materials, such as graphene and MoS₂, among others, and their characterization by means of SPM simulations. Effects such as the modification of the electronic properties by defects, molecular adsorption, or interaction with substrates are my main lines of investigation. Recently, I have started working on classical simulations of biomolecules.

My research activity is summarized in 27 international publications indexed in ISI WoS, with a **total of more than 1600 citations**. Among these are **1 Nature Materials** (318 citations), **1 Nano Research** (258 citations) and **3 Physical Review Letters** (totaling 461 citations), as well as other high impact journals such as **1 Nano Letters**, **2 ACS Nano** and **1 Chemical Science**. My h-index is 16, with an average of 49+ citations per article. Additionally, two of my articles are “**highly cited**” papers **according to ISI**. I have been part of, or collaborated with research groups in 3 different countries, participating in 25 international and national research projects, of which I have been **principal investigator in 5**.

I have conducted several research stays in Grenoble (France) and in Perth (Australia), the latter as a result of having received an Endeavor Award Research Fellowship from the Australian Government.

I started my teaching activity in 2001 as a PhD student. Since then, I have taught 800+ hours of official teaching in several degrees (bachelor, engineering, and postgraduate). I am also actively involved in several outreach programs.

Part C. RELEVANT MERITS

C.1. Selected 10 publications

1. Seco, J.M., San Sebastian, E., Cepeda, J., **Biel, B.**, Salinas-Castillo, A., Fernandez, B., Morales, D. P., Bobinger, M., Gomez-Ruiz, S., Loghin, F.C., Rivadeneyra, A., Rodriguez-Diéguez, A.
A Potassium Metal-Organic Framework based on Perylene-3,4,9,10-tetracarboxylate as Sensing Layer for Humidity Actuators
Scientific Reports, **8**, 14414 (2018)
Impact index (2017): **4.122**. Ranking: **12/64** (Q1)
2. Delač Marion, I., Čapeta, D., Pielic, B., Faraguna, F., Gallardo, A., Pou, P., **Biel, B.**, Vujičić, N., Kralj, M.
Atomic-scale defects and electronic properties of transferred synthesized MoS₂ monolayer
Nanotechnology, **29** (30), 305703 (2018)
Impact index (2017): **3.404**. Ranking: **30/146** (Q1)
3. Márquez, I.R., Fuentes, N., Cruz, C.M., Puente-Muñoz, V., Sotorrios, L., Marcos, M.L., Choquesillo-Lazarte, D. **Biel, B.**, Crovetto, L., Gómez-Bengo, E., González, M.T., Martin, R., Cuerva, J.M., Campaña, A.G.
Versatile Synthesis and Enlargement of Functionalized Distorted Heptagon-Containing Nanographenes
Chemical Science **8**, 1068-1074 (2017)
Impact index (publication year): **9.144**. Ranking: **14/163** (Q1) (B. Biel responsible for DFT and quantum transport simulations)
4. González, C., Dappe, Y., **Biel, B.**
Reactivity Enhancement and Fingerprints of Point Defects on a MoS₂ Monolayer Assessed by ab Initio Atomic Force Microscopy
The Journal of Physical Chemistry C **120**, 17115-17126 (2016)
Impact index (publication year): **4.509**. Ranking: **30/144** (Q1)
5. González, C., **Biel, B.**, Dappe, Y.
Theoretical characterisation of point defects on a MoS₂ monolayer by scanning tunnelling microscopy
Nanotechnology **27**, 105702 (1-12) (2016)
Impact index (publication year): **3.573**. Ranking: **16/125** (Q1)
6. Marconcini, P., Cresti, A., Triozon, F., Fiori, G, **Biel, B.**, Niquet, YM, Macucci, M., Roche, S.
Atomistic Boron-Doped Graphene Field-Effect Transistors: A Route toward Unipolar Characteristics
ACS Nano **6**, 7942 (2012)
Impact index (publication year): **12.06**. Ranking: **9/239** (Q1) (B. Biel responsible for DFT simulations)

7. **Biel, B.**, Blase, X., Triozon, F., Roche, S.
Anomalous doping effects on charge transport in graphene nanoribbons
Physical Review Letters **102**, 096803 (1-4) (2009)
Impact index (publication year): **7.33**. Ranking: **6/71** (Q1)
Paper within the 1% of the most cited papers in Physics in the year of their publication. Highly cited paper according to ISI.
8. **Biel, B.**, Triozon, F., Blase, X., Roche, S.
Chemically induced mobility gaps in graphene nanoribbons: a route for upscaling device performance
Nano Letters **9**, 2725-2729 (2009)
Impact index (publication year): 9.99. Ranking: **7/214** (Q1)
9. Cresti, A., Nemeč, N., **Biel, B.**, Niebler, G., Triozon, F., Cuniberti, G., Roche, S.
Charge transport in disordered graphene-based low dimensional materials
Nano Research **1**, 361-394 (2008)
Impact index (2016, no data for publication year): **7.354**. Ranking: **24/275** (Q1)
Paper within the 1% of the most cited papers in Physics in the year of their publication. Highly cited paper according to ISI.
10. Gómez-Navarro, C., De Pablo, P.J., Gómez-Herrero, J., **Biel, B.**, García-Vidal, F. J., Rubio, Ángel., Flores, F.
Tuning the conductance of single-walled carbon nanotubes by ion-irradiation in the Anderson localization regime
Nature Materials **4**, 534-539 (2005)
Impact index (publication year): **15.94**. Ranking: **1/178** (Q1) (B. Biel responsible for DFT and quantum transport simulations)

C.2. Selected research projects and grants (last five years)

- 1. Exploración de Defectos en Nuevos Materiales 2D Mediante Simulaciones Avanzadas a Escala Atómica**
Project sphere: Regional. Funding body: Junta de Andalucía
Funding: 110 k€ Principal investigator: Blanca Biel. Duration: 01/01/2020-30/06/2023
- 2. Two Dimensional Molecular Electronics Spectroscopy for DNA/RNA Mutation Recognition**
Project sphere: International. Funding body: MSCA-IF-2018 (European Commission)
Funding: 173 k€ Supervisor: Blanca Biel. Postdoctoral Researcher: Reza Rezapour. Duration: 01/07/2020-30/06/2022
- 3. Modelización de materiales complejos: biomoléculas y sistemas bidimensionales**
Project sphere: National. Funding body: MINECO
Funding: 121 k€ Principal investigator: José Ortega (IP), Blanca Biel (co-IP) Duration: 01/01/2018-31/12/2021
- 4. Formation of covalent molecular complexes on surfaces driven by light induced chemical reactions**
Project sphere: International. Funding body: University of Granada (Plan Propio de Investigación, Visiting Scholars)
Funding: 10 k€ Principal investigator: Blanca Biel /Pavel Jelínek Duration: 01/09/2017-31/08/2018
- 5. Revolutionary Embedded Memory for Internet of Things Devices and Energy Reduction (REMINDER)-H2020-687931**
Project sphere: International. Funding body: European Commission
Funding: 4500 k€ Coordinator: Francisco Gámiz (Granada) Duration: 02/01/2016-31/12/2020

C.5 Research evaluation:

- 2019 – present: **Spanish Supercomputing Network (RES)**
- 2019 – present: **Croatian Science Foundation**

- 2018 – present: **AEI – Ministerio de Ciencia, Innovación y Universidades (Spain)**
- 2017 – present: **Basic Energy and Science Department (USA)**
- 2013 – 2017: **ANEP – Ministerio de Economía y Empresa (MINECO) (Spain)**

C.6 Journal referee:

- **APS:** Physical Review X, Physical Review Letters and Physical Review B (> 35 since October 2008)
- **IOP:** 2D Materials, Nanotechnology, New Journal of Physics, Journal of Physics D. Applied Physics, Journal of Physics: Condensed Matter (> 15 since 2008)
- **IEEE:** Transactions on Electron Devices
- **ACS:** ACS Nano
- **Elsevier:** Physica E

C.7 Selected presentations in international conferences:

- **Nanospain 2019** (28th – 31st May, 2019), Barcelona (Spain) – **Invited Speaker**
- **Graphene Korea** (27th - 30th March, 2019), Incheon (South Korea) - **Invited speaker**
- **ICON 2DMat - International Conference on 2D Materials and Technologies** (10th -13th December, 2018), Melbourne (Australia) - **Keynote speaker**
- **2DSPM - International conference on Novel 2D materials explored via Scanning Probe Microscopy & Spectroscopy** (25th – 29th June 2018), San Sebastian – **Oral**
- **GRAPHENE2017** (28th – 31st March, 2017), Barcelona – **Oral (Plenary session)**

C.8 Awards:

- **2011 Research group** - University of Granada (Spain)
- **2010 Endeavour Award - Research Fellowship**, Department of Education, Employment and Workplace Relations (Australia)
- **2007 Outstanding PhD Award** - Autonomous University of Madrid (Spain)

C. 9 Conference organization:

- **Spanish Network of 2D Materials (sp2) - 2nd meeting** (4th – 5th April, 2019), Granada (Spain)
- **GRANADA'12 (Graphene Nanoscience: from Dirac Physics to Applications)** (9th – 13th September, 2012), Granada (Spain)

C.10. Institutional responsibilities:

- 2018 – 2019: **Board member – Faculty of Science, University of Granada**
- 2016 – 2017: **Board member - Higher Technical School of Information, Technology and Telecommunications Engineering, University of Granada**
- 2012 – 2017: **Board member - Dep. Electronics and Computer Technology, University of Granada**
- 2012 – 2016: **University Senate, University of Granada**
- 2002 – 2003: **University Senate, Autonomous University of Madrid**