

# CURRICULUM VITAE

## PERSONAL INFORMATION

<b>CV date</b>	12.0962019
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First and Family name	JOSE MANUEL QUESADA MOLINA		
Passport	PAA269692	Age	59

## 1) EDUCATION

Year of completion	Title or activity	Institution
1982	Degree in Physics	University of Sevilla1981
1985	PhD in Physics	University of Sevilla1985
1990	Post-Doctoral	CERN

## 2) CURRENT POSITION

Name of University/Institution	University of Seville		
Department	Atomic, Molecular and Nuclear Physics		
Address and Country	Seville, Andalusia, Spain		
Phone number	954550930	E-mail	<a href="mailto:quesada@us.es">quesada@us.es</a>
Current position	Full Professor	From	March 2012
UNESCO codes	220717 , 220790		
Keywords	Nuclear reactions, optical model, neutron cross sections, radiation transport, medical applications, technological applications		

## 3) 10 MOST RELEVANT PUBLICATIONS

- 1.** Title: Extensive air shower Monte Carlo modeling at flight altitude in the South Atlantic Magnetic Anomaly  
 Journal: Astroparticle physics 88 (2017) 17-29  
 Autores: Pazianotto, M. T.; Cortes-Giraldo, M. A.; Federico, C. A.; Hubert, G.; Gonçalves, O.; **Quesada J.M.**; Carlson, B. V.  
 Impact factor: 3.203 Q2 2 cites
- 2.** Title:: Nucleon scattering on actinides using a dispersive optical model with extended couplings  
 Journal: Physical Review C 94 (2016) 064605, p. 1-25  
 Authors: Soukhovitskii, E. Sh. ; Capote, R.; **Quesada, J. M.**; Chiba, S. ; Martyanov, D.  
 Impact factor: 3.820 Q1 16 cites
- 3.** Title: Recent developments in Geant4  
 Journal: Nuclear Instruments and Methods in Physics Research Section A 835 (2016) p. 186-225  
 Autores: J Allison, Katsuya Amako, J Apostolakis, Pedro Arce, M Asai, T Aso, E Bagli, A Bagulya, S Banerjee, G Barrant, BR Beck, AG Bogdanov, D Brandt, JMC Brown, H Burkhardt, Ph Canal, D Cano-Ott, S Chauvie, K Cho, GAP Cirrone, G Cooperman, MA Cortés-Giraldo, G Cosmo, G Cuttone, G Depaola, L Desorgher, X Dong, A Dotti, VD Elvira, G Folger, Z Francis, A Galoyan, L Garnier, M Gayer, KL Genser, VM Grichine, S Guatelli, P Guèye, P Gumplinger, Alexander S Howard, I Hřivnáčová, S Hwang, S Incerti, A Ivanchenko, VN Ivanchenko, FW Jones, SY Jun, P Kaitaniemi, N Karakatsanis, M Karamitros, M Kelsey, A Kimura, T Koi, H Kurashige, A Lechner, SB Lee, F Longo, M Maire, D Mancusi, A Mantero, E Mendoza, B Morgan, K Murakami, T Nikitina, L Pandola, P Paprocki, J Perl, I Petrović, MG Pia, W Pokorski, **JM Quesada**, M Raine, MA Reis, A Ribon, A Ristić Fira, F Romano, G Russo, G Santin, T Sasaki, D Sawkey, JI Shin, II Strakovsky, A Taborda, S Tanaka, B Tomé, T Toshito, HN Tran, PR Truscott, L Urban, V Uzhinsky, JM Verbeke, M Verderi, BL Wendt, H Wenzel, DH Wright, DM Wright, T Yamashita, J

Yarba, H Yoshida

Impact factor: 1.362 Q1 711 cites

4. Title: Geant4 simulation of the n\_TOF-EAR2 neutron beam: Characteristics and prospects  
Journal: The European Physical Journal A 52:100 (2016), p.1-10  
Authors: J. Lerendegui-Marco, S. LoMeo, C. Guerrero, M.A. Cortés-Giraldo, C. Massimi, **J.M. Quesada**, M. Barbagallo, N. Colonna, D. Mancusi, F. Mingrone, M. Sabate-Gilarte, G. Vannini, V. Vlachoudis, and the nTOF Collaboration  
Impact factor: 2.833 Q2 15 cites
  
5. Title: Geant4 simulations of the n\_TOF spallation source and their benchmarking.  
Journal : European Physical Journal.A 51: 160 (2015) p. 1-10  
Authors: Lo Meo, S.; Cortés-Giraldo, M. A.; Massimi, C. ; Lerendegui-Marco, J. ; Barbagallo, M.; Colonna, N.; Guerrero, C.; Mancusi, D.; Mingrone, F.; **Quesada, J. M.**; Sabaté-Gilarte, M.; Vannini, G.; Vlachoudis, V. ; n\_TOF Collaboration .  
Impact factor: 2.373 Q3 28 cites
  
6. Title: Rotational-vibrational Description of Nucleon Scattering on Actinide Nuclei Using a Dispersive Coupled-channel Optical Model.  
Journal: Nuclear Data Sheets 118: (2014) 270-272.  
Authors: **Quesada, J. M.**; Capote, R.; Shoukhovitskii, E. Sh.; Chiba, S.  
Impact factor: 4.571 Q1 16 cites
  
7. Title: Measurement of the MACS of  $^{181}\text{Ta}(n,\gamma)$  at  $kT=30$  keV as a test of a method for Maxwellian neutron spectra generation.  
Journal: Nuclear Instruments & Methods in Physics Research. Section A 727 (2013) p.1-6.  
Authors: Praena, J.; Mastinu, P. F.; Pignatari, M.; **Quesada, J. M.**; Garcia-Lopez, F. J.; Lozano, M.; Dzysiuk, N.; Capote, R.; Martín-Hernández, G.  
Impact factor: 1.316 Q2 12 cites
  
8. Title: An implementation to read and write IAEA phase-space files in GEANT4-based simulations.  
Journal: International Journal of Radiation Biology 88 (2012) 200-208.  
Authors: Cortes-Giraldo, M. A.; **Quesada, J. M.**; Gallardo, M. I.; Capote, R.  
Impact factor: 1.895 Q1 18 cites
  
9. Title: Geant4 hadronic physics for space radiation environment.  
Journal: International Journal of Radiation Biology. 88 (2012) 171-175.  
Authors: Ivanchenko, A; Ivanchenko, V; **Quesada, J. M.**; Incerti, S.  
Impact factor: 1.895 Q1 42 cites
  
10. Title: Benchmarking nuclear models of FLUKA and GEANT4 for carbon ion therapy.  
Journal: Physics in Medicine and Biology 55 (2010) p. 5833-5847  
**Authors:** Böhlen, T.T.; Donsan, J. M.; Cerutti, F.; Ferrari, A.; Gudowska, I.; Mairani, A.; **Quesada, J. M.**  
Impact factor: 3.057 Q1 131 cites

#### 4) CURRENT FUNDED RESEARCH PROJECTS

1. Title: NEUTRONES, INSTRUMENTACION NUCLEAR E INVESTIGACION RELACIONADA CON TERAPIA CON PROTONES EN EL CNA E INSTALACIONES INTERNACIONALES  
Reference: RTI2018-098117-B-C21 , Spanish Ministry of Science, Innovation and Universities  
Period: 2019-2021  
Funding: 205.700,00 euros  
Project leader: José Manuel Quesada Molina
2. Title: FISICA NUCLEAR Y APLICACIONES MEDICAS EN EL CNA E INSTALACIONES INTERNACIONALES  
Reference: FPA2016-77689-C2-1-R, Spanish Ministry of Science, Innovation and Universities

# CURRICULUM VITAE

Period: 2017-2019

Funding: 433.180,00 euros

Project leader: José Manuel Quesada Molina

**3. Title: NeutAndalus: boosting interdisciplinary neutron science in Spain and Europe.**

Reference: PCIG12-GA-2012-334315 ( dela UE: PEOPLE MARIE CURIE ACTIONS Marie Curie Career Integration Grants. Call: FP7-PEOPLE-2012-CIG.) , European Commission

Period: 2014-2019.

Funding: 100.000,00 EUR.

Project Leader: José Manuel Quesada Molina.

**5) PhD THESES SUPERVISED (LAST 10 YEARS)**

- Co-supervised (together with. Dr. M.I. Gallardo Fuentes). Candidate: Miguel Antonio Cortés Giraldo,"*Developments and applications of Geant4 for radiotherapy and microdosimetry and integrated circuits*", University of Seville, June 2011, marked Apto Cum Laude by unanimity. (European doctorate with international award).
- Co-supervised (together with. Dr. Javier Praena Rodríguez). Candidate: Marta Sabaté Gilarte, "*The n TOF-EAR2 facility at CERN: neutron flux determination and  $^{33}\text{S}(n,\alpha)^{30}\text{Si}$  cross section measurement; implications in BNCT*", University of Seville, May 2017, marked Apto Cum Laude by unanimity . (European doctorate with international award).
- Mentored (supervised by Dr. Javier Praena Rodríguez). Candidate: Pablo Jiménez Bonilla, "*Experiments of activation in nuclear astrophysics for the measurement of stellar cross sections of neutron capture: procedure development and experimental measurement of the stellar cross section of the reaction  $^{197}\text{Au}(n,\gamma)$* ".University of Seville, April 2018, marked Apto Cum Laude by unanimity .

**6) Academic quantitative indicators (as by September 2018)**

- Total number of citations (from WOK): 2251 (Without self citations :1840)
- Total number of citations 2013-2017 (from WOK): 608 (Without self citations: 455)
- Average number of citations (citations/year) 2014-2017 (from WOK): 101.33
- Number of articles 2013-2017(from WOK): 92
- Total number of publications in Q1 : 73
- h-index: 11 (2013-2017, WOK), 24 (Total WOK), 29 (Scopus), 33 (Google Scholar)

**7) Links to the web pages ORCID, MyResearcherID (ISI) or MyCitations (Google Scholar):**

Researcher links	Google Scholar	<a href="https://scholar.google.com/citations?hl=en&amp;user=shhsDWcAAAAJ&amp;view_op=list_works&amp;sortby=pubdate">https://scholar.google.com/citations?hl=en&amp;user=shhsDWcAAAAJ&amp;view_op=list_works&amp;sortby=pubdate</a>
	Researcher ID	<a href="http://www.researcherid.com/rid/K-5267-2014">http://www.researcherid.com/rid/K-5267-2014</a>
	Orcid code	<a href="http://orcid.org/0000-0002-2038-2814">http://orcid.org/0000-0002-2038-2814</a>

**8a) Brief summary**

I am member of the Collaboration n\_TOF for the measurement of nuclear data of neutron-induced reactions since its inception in 1999, having been until present "Team Leader" of the Group of the University of Seville (<http://grupo.us.es/ntof>). As such, I take my share of shifts allotted to our group, participate in our specific experiments (proposed to and accepted by the INTC) and in the meetings of the Collaboration. In particular, I have recently been co-author of the proposal and implementation of the measurement of the cross section of the  $^{33}\text{S}(n,\alpha)$  reaction.

Since 2001, I have participated in the development of a dispersive optical potential for nucleon-nucleus scattering, with symmetry of isospin, valid for coupled channels calculations of and of wide generality. A fundamental aspect was the derivation of the analytical expressions of the polarization contributions to the real part of the potential, which has served as basis for the later developments. The results of these works are included in a doctoral thesis and in several publications. Important milestones in this development were the incorporation of isospin symmetry to formalism and, subsequently, its application to very deformed nuclei (in particular actinides, due to their special

relevance); this application was initially restricted to the case of even-even nuclei, but later it has been extended to the more complex, but greatly relevant, A-odd nuclei.

Since 2006 I work in the field of Monte Carlo simulations of radiation transport in matter, through the collection of open source libraries Geant4, being, since September of 2007, member of its Hadronic Working Group. My contributions have focused on the nuclear preequilibrium and de-excitation models used in Geant4 and, more specifically, in the inclusion of more realistic cross sections for the emission of nucleons and light clusters, as well as on the improvement of the implementation of the models of photon emission, generalized evaporation, breakup and fission. These developments paved the way for Geant4 to participate in the benchmark of the International Atomic Energy Agency (IAEA) of nuclear models for neutron spallation reactions, during which I was his representative in several international meetings.

I was invited to participate in the "Coordinated Research Project" CRP-CHARPAR of the International Atomic Energy Agency with the title "Heavy charged-particle interaction data for radiotherapy", attending its coordination meetings and contributing to the elaboration of the corresponding official documents.

I have worked on the development of Geant4 applications in the domains of neutron spallation reactions (n\_TOF), radiotherapy (electron-photons, protons and heavy ions), microelectronics (effects of radiation on microcircuits) and aerospace technology (calculation of the atmospheric dose of cosmic origin). In relation to this last aspect, I have been Visiting Senior Scientist of the Technological Institute of Aeronautics in Brazil within the *Programa Pesquisador Visitante Especial* CSF-PVE's 766/2014, processo (88881.030403/2013-01, with 1 month visits during the years 2014-2015-2016.

Since 2012, I have participated in the development, commissioning and first experiments of a experimental line for dosimetry with protons of the 3MV Tandem Van de Graaff accelerator of the CNA. I requested and obtained a grant for a research stay (July-December 2012) from a renowned expert in the field, Dr. Dieter Schardt (GSI, Germany), who as been member of our work team in former projects and now keeps collaborating with us (<http://grupo.us.es/geterus>).

I have participated as Spanish representative in the Technical Meeting on Nuclear Data for Medical Applications organized by IAEA in Vienna, Austria 10-13 December 2018

## 8b) Patent

Authors: Gallardo-Fuentes, Maria Isabel; Gonzalez-Alvarez, Marcos Aurelio; **Quesada Molina, Jose Manuel**; Perez-Vega-Leal, Alfredo; Cortes-Giraldo, Miguel Antonio; Espino-Navas, Jose Manuel; Arráns-Lara, Rafael.

Title: Sistema y Método de Verificación de Tratamientos de Radioterapia.

Patent: ES 2409760 B1, Año: 2014.

## 8c) Activity as evaluator

Evaluator of : Nuclear Physics A (since 2006), Physical Review and Physical Review Letters (since 2005), Nuclear Instruments and Methods in Physics Research B (since 2013), Journal of Radiation Research (since 2013), Radiation Physics and Chemistry (since 2011), The European Physical Journal A (since 2008)

I'm also evaluator of the Spanish Agencia Nacional de Evaluación y Prospectiva (ANEP) since May 1, 2006.