Section A. PERSONAL DATA

Name and Surname	Javier Antonio Olmedo Nieto		
DNI/NIE/Passport		Age	
Researcher's identification number	Researcher ID	B-3058-2017	
	Scopus Author ID		
	ORCID	0000-0002-8722-0262	

A.1. Current professional situation

Institution	Universidad de Granada
Dpt. / Centre	Theoretical Physics and Physics of the Cosmos / Facultad de Ciencias
Address	Fuentenueva s/n, 18071, Granada
Phone	Email
Professional category	Postdoctoral Researcher
UNESCO spec. code	221212 - Quantum field theory
Keywords	Primitive universe; Black holes; Quantum field theory in curved spacetime; quantum gravity; Quantum field theory

Phone row detail: Email: jolmedo.ugr@gmail.com

Professional category row: Start date 2020

A.2. Academic education (Degrees, institutions, dates)

Bachelor/Master/PhD	University	Year
Programa Oficial de Doctorado en Ciencias Físicas	Universidad Complutense de Madrid	2012
Master in Physics	Universidad Complutense de Madrid	2009
Graduate in Physics	Universidad Complutense de Madrid	2008

A.3. General quality indicators of scientific production

Statistics from Research ID:

Total Articles in Publication List: 37
Articles With Citation Data: 33
Sum of the Times Cited: 593
Average Citations per Article: 18.0
h-index: 16

Statistics from INSPIRE HEP:

34 papers found (published or arXiv)

Number of citeable papers: 42
Number of citeable published papers: 31
Number of citations of citeable papers: 798
Number of citations of published papers: 786
Citations per citeable paper (average):   19
Citations per published paper (average): 25.4
hHEP index of citeable papers: 18
hHEP index of published papers: 18

Section B. SUMMARY OF THE CURRICULUM

My name is Javier A Olmedo Nieto. I am a senior postdoctoral fellow at Universidad de Granada, Spain. I have focused my research on fundamental aspects of quantum field theories, cosmological settings and black hole spacetimes. On the one hand, I have studied the quantization of different cosmological scenarios, in vacuum and with several types of matter, as well as when they are supplemented with perturbations (linear field theories). Those studies have been performed both analytically and numerically. Moreover, I have developed uniqueness criteria for the Fock quantization of fields in nonstationary settings. They allowed me to propose a vacuum state for perturbations in the early universe. Actually, its predictions are in very good harmony with present observations. On the other hand, I have also investigated the quantization of 3+1 inhomogeneous gravitational scenarios, both in vacuum and in presence of matter. Among them, I have paid especial attention to spherically symmetric gravity, Gowdy cosmologies and axisymmetric gravity. I have shown that, in some of those settings where a quantization has been achieved, the classical singularity is replaced by a high curvature, regular region. Besides, the spatial geometry shows a fundamental discretization that affects the traditional understanding of quantum fields on curved spacetimes. For instance, the typical infinities that require renormalization of the stress-energy tensor turn out to be replaced by finite (but Planck order) contributions.

My research interests are focused not only on the extension of all the previous methods so as to account for more general systems, but also on the development of novel numerical and analytical tools as well as on the discussion of tests to check the validity of these models in realistic situations, eventually comparing their predictions with observational data. In this manner, one would have tools to discriminate the true nature of the gravitational interaction.

I have contributed with 36 manuscripts (out of them two accepted and three recently submitted for publication), one of them a review article on one of the topics where I am an expert, 8 contributions to conference proceedings, as well as I have been Editor of the book proceedings of the Loops11 conference. I have also participated in 28 conferences and workshops, highlighting three plenary talks (Loops15, Erlangen, Germany; QGSCVII, Punta del Este, Uruguay. Loops19, State College, USA) and two invited talk (APS April Meeting 2016, Salt Lake City, US; 2nd workshop on "Singularities of general relativity and their quantum fate", Warsaw, Poland). Presently, I hold a h index of 18 and a total of 798 citations (InspireHep).

Moreover, as a research assistant at University of the Republic (Uruguay), I had the opportunity to teach several subjects for both early and advanced undergraduate students. Concretely, I taught in the Degree of Physics two semesters of Elementary Physics, with large enrollments of early undergraduate students, and one semester of Computational Physics and another one of Quantum Mechanics for advanced undergraduate students. Moreover, I have supervised the undergraduate thesis and co-supervised the master thesis of a student in fundamental physics at the University of the Republic. I am currently co-supervising a PhD student at Universidad Complutense (Madrid). At present, I hold a "profesor contratado doctor" accreditation from ANECA.

Section C. MOST RELEVANT MERITS (ordered by typology)

C.1. Publications
1 **Scientific paper**. Gambini, R.; Olmedo, J.; Pullin, J.2020. Spherically symmetric loop quantum gravity: analysis of improved dynamics arxiv:2006.01513.
2 **Scientific paper**. Ashtekar, A.; Olmedo, J.2020. Properties of a recent quantum extension of the Kruskal geometry arxiv:2005.02309.
3 **Scientific paper**. Ashtekar, A.; Olmedo, J.; Singh, P.2018. Quantum Transfiguration of Kruskal Black Holes Physical Review Letters. 121-241301.
4 **Scientific paper**. Campiglia, M.; et al. 2016. Quantum self-gravitating collapsing matter in a quantum geometry Classical and quantum gravity. 33 no. 18-18LT01.

5 **Scientific paper**. Martín-de Blas, D.; Olmedo, J.2016. Primordial power spectra for scalar perturbations in loop quantum cosmology Journal of Cosmology and Astroparticle Physics. 2016-06, pp.029.

6 **Scientific paper**. Gambini, R.; Olmedo, J.; Pullin, J.2014. Quantum black holes in loop quantum gravity Classical and quantum gravity. 31-095009.

7 **Scientific paper**. Fernández-Méndez, M.; Mena Marugán, G. A.; Olmedo, J.2012. Hybrid quantization of an inflationary universe Physical Review D. 86-024003.

8 **Scientific paper**. Cortez, J.; et al. 2011. A uniqueness criterion for the Fock quantization of scalar fields with time-dependent mass Classical and quantum gravity. 28-172001.

9 **Scientific paper**. Agullo, I.; Olmedo, J.; Sreenath, V.2020. Observational consequences of Bianchi I spacetimes in loop quantum cosmology arxiv:2006.01883.

10 **Scientific paper**. Agullo, I.; Olmedo, J.; Sreenath, V.2020. Hamiltonian theory of classical and quantum gauge invariant perturbations in Bianchi I spacetimes Physical Review D (accepted).

11 **Scientific paper**. Agullo, I.; Olmedo, J.; Sreenath, V.2020. Predictions for the CMB from an anisotropic quantum bounce Physical Review Letters (accepted).

12 **Scientific paper**. Agullo, I.; Olmedo, J.; Sreenath, V.2020. xAct implementation of the theory of cosmological perturbation in Bianchi I spacetimes Mathematics. MDPI. 8(2)-290.

13 **Scientific paper**. Gambini, R.; et al. 2018. Classical axisymmetric gravity in real Ashtekar variables Classical and Quantum Gravity. 36-125009.

14 **Scientific paper**. Ashtekar, A.; Olmedo, J.; Singh, P.2018. Quantum Extension of the Kruskal Space-time Physical Review D. 98-126003.

15 **Scientific paper**. Olmedo, J.; Alesci, E.2018. Power spectrum of primordial perturbations for an emergent universe in quantum reduced loop gravity Journal of Cosmology and Astroparticle Physics. 1904-030.

16 **Scientific paper**. Martín de Blas, D.; Olmedo, J.; Pawlowski, T.2017. Loop quantization of the Gowdy model with local rotational symmetry Physical Review D. 96-106016.

17 **Scientific paper**. Castelló Gomar, L.; et al. 2017. Hybrid loop quantum cosmology and predictions for the cosmic microwave background Physical Review D. 96-103528.

18 **Scientific paper**. Olmedo, J.; Saini, S.; Singh, P.2017. From black holes to white holes: a quantum gravitational, symmetric bounce Classical and Quantum Gravity. 34-225011.

19 **Scientific paper**. Olmedo, J.; Martín de Blas, D.; Pawlowski, T.2017. Local rotational symmetry Gowdy model in loop quantum gravity The Fourteenth Marcel Grossmann Meeting. pp.4043-4047.

20 **Scientific paper**. Cortez, J.; et al. 2016. Uniqueness of the Fock quantization of scalar fields in a Bianchi I cosmology with unitary dynamics Physical Review D. 84-105019.

21 **Scientific paper**. Corichi, A.; Olmedo, J.; Rastgoo, S.2016. Callan-Giddings-Harvey-Strominger vacuum in loop quantum gravity and singularity resolution Physical Review D. 94-084050.

22 **Scientific paper**. Olmedo, J.2016. Brief review on black hole loop quantization Universe. 2-(2) 12.

23 **Scientific paper**. Olmedo, J.2016. Evolution in totally constrained models: Schrodinger vs. Heisenberg pictures International Journal of Modern Physics D. 25-8, pp.1642004.

24 **Scientific paper**. Gambini, R.; Olmedo, J.; Pullin, J.2016. Schrodinger-like quantum dynamics in loop quantized black holes International Journal of Modern Physics D. 25-8, pp.1642006.

25 **Scientific paper**. Benítez-Martínez, F.; Olmedo, J.2016. Primordial tensor modes of the early universe in the hybrid quantization Physical Review D. 93-124008.

26 **Scientific paper**. Gambini, R.; Olmedo, J.; Pullin, J.2015. Casimir effect in a quantum space-time Classical and quantum gravity. 32-11, pp.115002.

27 **Scientific paper**. Castello-Gomar, L.; et al. 2014. Cosmological perturbations in Hybrid Loop Quantum Cosmology: Mukhanov-Sasaki variables Physical Review D. 90-064015.

28 **Scientific paper**. Gambini, R.; Olmedo, J.2014. The SL(2,R) totally constrained model: three quantization approaches General Relativity and Gravitation. 46-1768.

29 **Scientific paper**. Fernández-Méndez, M.; Mena Marugán, G. A.; Olmedo, J.2014. Effective dynamics of scalar perturbations in a flat Friedmann-Robertson-Walker spacetime in loop quantum cosmology Physical Review D. 89-044041.

30 **Scientific paper**. Fernández-Méndez, M.; Mena Marugán, G. A.; Olmedo, J.2013. Hybrid quantization of an inflationary model: The flat case Physical Review D. 88-044013.

31 **Scientific paper**. Cortez, J.; et al. 2012. Criteria for the determination of time dependent scalings in the Fock quantization of scalar fields with a time dependent mass in ultrastatic spacetimes Physical Review D. 86-104003.

32 **Scientific paper**. Fernández-Méndez, M.; et al. 2012. Unique Fock quantization of scalar cosmological perturbations Physical Review D. 85-103525.

33 **Scientific paper**. Mena Marugán, G. A.; Olmedo, J.; Pawlowski, T.2011. Prescriptions in loop quantum cosmology: A comparative analysis Physical Review D. 84-064012.

34 **Scientific paper**. Cortez, J.; et al. 2011. Uniqueness of the Fock quantization of fields with unitary dynamics in nonstationary spacetimes Physical Review D. 83-025002.

35 **Scientific paper**. Cortez, J.; et al. 2010. A unique Fock quantization for fields in non-stationary spacetimes Journal of Cosmology and Astroparticle Physics. 2010-10.

36 **Scientific paper**. Martín-Benito, M.; Mena Marugán, G. A.; Olmedo, J.2009. Further improvements in the understanding of isotropic loop quantum cosmology Physical Review D. 80-104015.

C.2. Participation in R&D and Innovation projects

1 Theoretical Investigations in Classical and Quantum Gravity National Science Foundation. Abhay Ashtekar. (Pennsylvania State University). 01/08/2015-31/07/2018. 622.386 €.

2 Gravedad y universo cuántico: cosmología de lazos, agujeros negros y fractales Ministerio de Economía y Competitividad. Guillermo Antonio Mena Marugán. (Consejo Superior de Investigaciones Científicas). 01/01/2015-31/12/2017. 38.720 €.

3 Agujeros negros cuánticos Agencia Nacional de Investigación e Innovación. Rodolfo Gambini Italiano. (Universidad de la República). 18/11/2014-19/11/2017. 21.000 €.

4 The dynamics of quantum gravity: symmetry reduced models National Science Foundation. Jorge Pullin. (Louisiana State University). 24/07/2013-31/07/2017. 325.200 €.

5 Cosmología de lazos, gravedad análoga y física de agujeros negros Ministerio de Ciencia e Innovación. Guillermo Antonio Mena Marugán. (Consejo Superior de Investigaciones Científicas). 01/01/2012-31/12/2014. 43.560 €.

6 Cosmología Cuántica de Lazos, agujeros negros y relatividad numérica Ministerio de Ciencia e Innovación. Guillermo Antonio Mena Marugán. (Consejo Superior de Investigaciones Científicas). 01/01/2009-31/12/2011. 81.070 €.

C.3. Participation in R&D and Innovation contracts

C.4. Patents