

Héctor Ramírez, Ph.D.

Curriculum vitae

Present Position	Research fellow in Theoretical Physics Instituto de Física Corpuscular (IFIC) & Department of Theoretical Physics University of Valencia Parque Científico, C/Catedrático José Beltrán, 2. Paterna, 46980; Spain. (+34)693012381 — vanhramirez@gmail.com — https://hectoramirez.github.io
Nationality	Mexican — Current residence: Spain
Research Interests	Cosmology: Inflation, Dark Energy, Modified Gravity, Scalar-Tensor Theories of Gravity, Primordial Black-Holes, Gravitational Waves

Education

PhD in Physics 2015-2019	University of Valencia , Spain. Supervisor: Dr. Olga Mena Dissertation: <i>'Noncanonical Approaches to Inflation'</i>
MA in Advanced Physics 2013-2014	University of Valencia , Spain. Supervisor: Dr. Olga Mena Dissertation: <i>'The Hu-Sawicki Model of Modified Gravity'</i>
BA in Physics 2008-2013	University of Veracruz , Mexico. Supervisor: Dr. Sergio Lerma Dissertation: <i>'Quantum Chaos in the Dicke Model'</i>
2012	University of Valencia (Academic exchange semester), Spain.

Professional Experience

Long Research Stays

Apr - Jun, 2018	Institute of Cosmology and Gravitation, University of Portsmouth Studied general phenomenological implications of general scalar-tensor theories for inflation.
Jan - Mar, 2018	Kavli IPMU, The University of Tokyo Developed inflationary models from scalar-vector-tensor theories of gravity.
May - Aug, 2017	Fermi National Accelerator Laboratory (Fermilab) & Kavli Institute for Cosmological Physics – The University of Chicago Developed inflationary models from Horndeski Gravity.
Apr - Jun, 2015	Abdus Salam International Center for Theoretical Physics (ICTP) Carried out a forecast of CORE and for selected inflationary models.
Mar - May, 2014	NEXT Experiment, Instituto de Física Corpuscular (IFIC) Carried out a gamma particle production simulation for the NEXT experiment.

Teaching

I have taught undergraduate courses managed by the Department of Theoretical Physics at the University of Valencia during the last four academic years—about 45 hours in the classroom (groups of around 15 students) + class preparation, per academic year.

Classical Mechanics	Teaching Assistant (2017-2019): Resolution of problems, examinations, evaluation of teaching contents and elaboration of teaching material.
Introductory Physics	Teaching Assistant (2015-2018): Resolution of problems, occasional lectures, examinations and grading.

Journal referee

2017 -	Referee for <i>Physical Review Letters</i> , American Physical Society (USA).
2016 -	Referee for <i>Physical Review D</i> , American Physical Society (USA).

Publications

2018	<p>L. Heisenberg, H. Ramírez, S. Tsujikawa, <i>“Inflation with mixed helicities and its observational imprint on CMB”</i>, Phys. Rev. D 99 (2019) no.2, 023505. arXiv:1812.03340 [gr-qc]</p> <p>H. Ramírez, S. Passaglia, H. Motohashi, W. Hu and O. Mena, <i>“Reconciling tensor and scalar observables in G-inflation”</i>, JCAP 1804 (2018) no.04, 039 arXiv:1802.04290 [astro-ph.CO].</p>
2017	<p>S. Gariazzo, O. Mena, V. Miralles, H. Ramírez and L. Boubekeur, <i>“The running of featureful primordial power spectra”</i>, Phys. Rev. D 95 (2017) no.12, 123534 arXiv:1701.08977 [astro-ph.CO].</p>
2016	<p>S. Gariazzo, O. Mena, H. Ramírez and L. Boubekeur, <i>“Primordial power spectrum features in phenomenological descriptions of inflation”</i>, Phys. Dark Univ. 17 (2017) 38 arXiv:1606.00842 [astro-ph.CO].</p>
2015	<p>M. Escudero, H. Ramírez, L. Boubekeur, E. Giusarma and O. Mena, <i>“The present and future of the most favoured inflationary models after Planck 2015”</i>, JCAP 1602 (2016) no.02, 020 arXiv:1509.05419 [astro-ph.CO].</p> <p>L. Boubekeur, E. Giusarma, O. Mena and H. Ramírez, <i>“Do Current Data Prefer a Non-minimally Coupled Inflaton?”</i>, Phys. Rev. D 91 (2015) 103004 arXiv:1502.05193 [astro-ph.CO].</p>
2014	<p>L. Boubekeur, E. Giusarma, O. Mena and H. Ramírez, <i>“Phenomenological approaches of inflation and their equivalence”</i>, Phys. Rev. D 91 (2015) 8, 083006 arXiv:1411.7237 [astro-ph.CO].</p> <p>L. Boubekeur, E. Giusarma, O. Mena and H. Ramírez, <i>“On the current status of Modified Gravity”</i>, Phys. Rev. D 90, no. 10, 103512 (2014) arXiv:1407.6837 [astro-ph.CO].</p>

Awards and Fellowships

2015 - 2019	<p>FPI Research fellow by the <i>Ministry of Economy, Industry and Competitiveness</i> (MINECO) Spanish Government</p>
Jul - Sep, 2014	<p>Research scholarship granted by the University of Valencia Valencia, Spain.</p>
Jan - Jul, 2012	<p>Grant for an abroad academic exchange semester by the University of Veracruz Carried out at the Faculty of Physics, <i>University of Valencia</i>.</p>
2009 - 2011	<p>Faculty award due to academic excellence (received twice) <i>University of Veracruz</i></p>

Talks

Conference talks

2018	Apr 18	<p>Computing inflationary predictions in general scalar-tensor theories [Link] BritGrav18 meeting, <i>Institute of Cosmology and Gravitation, University of Portsmouth</i>.</p> <p>Generalized slow-roll approach for Horndeski inflation [Link] Gravity and Cosmology 2018, <i>Yukawa Institute for Theoretical Physics, Kyoto University</i>.</p>
2017	Sep 13	<p>Meeting on Fundamental Cosmology, <i>Centro de Estudios de Física del Cosmos de Aragón</i>.</p>
	Aug 30	<p>COSMO-17, <i>Paris Diderot University</i>.</p>

2016	May 25	Do current data prefer a nonminimally coupled inflaton? [Link] <i>Planck 2016, University of Valencia.</i>
Seminars		
2018	Dec 12	Inflation beyond GR [Link] 2nd <i>Valencia Winter Workshop</i> on Theoretical Physics, <i>University of Valencia.</i>
	Oct 16	<i>Theoretical seminar</i> , Theory Group (hosted by Vincent Vennin). <i>APC – Paris Diderot University</i>
	Mar 26	Computing inflationary predictions in general scalar-tensor theories Webinar for the <i>Elusives</i> Network
	Mar 6	Astro Lunch Seminar, <i>Kavli Institute for the Physics and Mathematics of the Universe (IPMU), The University of Tokyo.</i>
2017	Nov 2	Generalized slow-roll approach for Horndeski inflation Journal club seminar, Astrophysics group (hosted by Bruno Moraes and Will Hartley). <i>University College London</i>
	Nov 1	<i>Theoretical Cosmology Meeting</i> , <i>Institute for Cosmology and Gravitation</i> (hosted by David Wands). <i>University of Portsmouth</i>
	Sep 6	<i>Group seminar</i> , <i>Institute de Physique Théorique</i> (hosted by Filippo Vernizzi). <i>CNRS, Saclay</i>
	Aug 9	<i>Group seminar</i> , <i>Center for Computational Astrophysics (CCA)</i> (hosted by Francisco Villaescusa). <i>Flatiron Institute, New York.</i>
	Jun 8	<i>Special seminar</i> , <i>Lawrence Berkeley National Laboratory</i> (hosted by Shirley Ho). <i>University of California at Berkeley</i>
	Jul 27	Revisiting slow-roll inflation (Blackboard talk) <i>Chalk talk series</i> , <i>Fermilab Center for Particle Astrophysics.</i>
2016	Feb 24	Do current data prefer a nonminimally coupled inflaton? <i>54th Schladming Winter School of Theoretical Physics</i>
	Feb 9	Single-Field Slow-Roll Inflation: a review and some particular aspects [Link] <i>Students Seminar series, (IFIC) – University of Valencia.</i>
2013	May 7	Quantum Chaos in the Dicke Model <i>Special seminar, Faculty of Physics – University of Veracruz.</i>

Participations at Workshops and Schools

Workshops

2015	Jun 22-26	Invisibles '15 workshop Institute of Theoretical Physics, <i>Autonomous University of Madrid (UAM).</i>
	Apr 13-17	Workshop on ‘Off-the-Beaten-Track Dark Matter and Astrophysical Probes of Fundamental Physics Abdus Salam International Center for Theoretical Physics (ICTP)

Schools

2016	Feb 21-26	54th Schladming Winter School of Theoretical Physics: ‘New Trends in Particle Physics, Quantum Gravity and Cosmology’
2015	May 18-29	First ICTP Advanced School on Cosmology Abdus Salam International Center for Theoretical Physics (ICTP)
2014	Oct 6-10	Tools for Cosmology: Class and Monte Python Codes Course taught by Prof. Julien Lesgourgues <i>et al.</i> at ICC, Barcelona.
2013	Jul 22-2	Latin American School of Physics, Marcos Moshinsky: ‘Non-Linear Dynamics in Hamiltonian Systems’

2011 Jun 20-28 | **VII National School on Nuclear and Particle Physics**
 Institute of Physics and Nuclear Sciences, National Autonomous University of Mexico
 (UNAM)

As well as special [courses](#) on **Inflation**, **Group Theory**, **Supersymmetry**, **Black Holes** and **Holography**.

Skills

Computer

Programming	Python (NumPy, Matplotlib, pandas, SciPy, GetDist, etc.), Mathematica.
Database	SQL (DataCamp certification).
Web	HTML, CSS.
Office suits	L ^A T _E X, Apple iWork, Microsoft Office, OpenOffice.
Other	Git, Bash scripting.

Languages

Spanish: Native; **English:** Fluent; **French:** B2 level. I have also taken **German** and **Italian** courses.

Sports

Highly active in organizing, managing and participating in sport teams, mainly on **football soccer**—I have joined and organized football teams in every place I have done a research stay.

References

Dr. Olga Mena Requejo

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Prof. Nick E. Mavromatos

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Prof. Wayne Hu

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Prof. David Wands

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 University of Portsmouth
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Prof. Shinji Tsujikawa

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 Tokyo University of Science
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Teaching References:

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Prof. José Peñarrocha

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