

# CURRICULUM VITAE

July 6, 2023

## Personal Data

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**Name:** Francisco Villaescusa-Navarro  
**Title:** Ph.D. in physics  
**Nationality:** Spanish  
**Employment:** Research Scientist  
**Work address:** Simons Foundation, 160 5th Avenue, New York, NY, 10010, USA  
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**Phone:** [+1] 718-414-7853

## Education

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<b>Ph.D.</b>	Physics	07/2008 - 05/2012	Valencia University, Spain
<b>M.Sc.</b>	Physics	09/2007 - 07/2008	Valencia University, Spain
<b>B.Sc.</b>	Physics	09/2002 - 07/2007	Valencia University, Spain Granted with Excellent prize

## Academic and Professional Positions

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<b>Research Scientist</b>	Simons Foundation, New York, USA	09/2021 - present
<b>Visiting Research Scholar</b>	Princeton University, Princeton, USA	10/2021 - present
<b>Associate Research Scholar</b>	Princeton University, Princeton, USA	09/2019 - 09/2021
<b>Flatiron Research Fellow</b>	CCA, Flatiron Institute, New York, USA	09/2016 - 09/2019
<b>CosmoIGM Postdoctoral Fellow</b>	INAF/INFN, Trieste, Italy	07/2012 - 08/2016
<b>JAE Predoctoral Fellow</b>	IFIC/Valencia University, Spain	01/2008 - 06/2012
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<b>Visiting graduate student</b>	ITC, Harvard University, USA	07/2010 - 08/2011
<b>Visiting graduate student</b>	CITA, Toronto, Canada	09/2009 - 12/2009
<b>Undergraduate research fellow</b>	IFIC/Valencia University, Spain	09/2007 - 12/2007
<b>Undergraduate research fellow</b>	Valencia University, Spain	01/2007 - 06/2007
<b>Undergraduate summer fellow</b>	Institut fur Kernphysik, Mainz, Germany	08/2006 - 09/2006

## Major Fields of Research

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I am a computational cosmologist working on developing the theoretical framework needed to answer fundamental questions through data from cosmological surveys in the most precise way.

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Machine Learning	Massive neutrinos cosmology	21cm cosmology	Numerical simulations
Large-scale structure	Information content	Galaxy clusters	Cosmic voids
Baryonic acoustic oscillations	Redshift-space distortions	Analytics methods	Modified Gravity
$\text{Ly}\alpha$ -forest	Galaxy formation and evolution	Dark matter	Software development

## Professional activities

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<b>Referee</b>	Monthly Notices of the Royal Astronomical Society	2012-
	Physical Review D	2013-
	Physical Review Letters	2015-
	Journal of Cosmology and Astroparticle Physics	2015-
	The Astrophysical Journal	2015-
	Revista Metode	2016-
	The American Astronomical Society Journal	2016-
	Nature	2017-
	Physical Review E	2019-
	European Physical Journal C	2020-
	Publications of the Astronomical Society of Japan	2020-
	Nature Artificial Intelligence	2021-
	Nature Astronomy	2021-
	Physics of the Dark Universe	2021-
	Machine Learning: Science and Technology	2022-
Journal of the Franklin Institute	2022-	
RAS Techniques and Instruments	2022-	
<b>Reviewer</b>	DIRAC High Performance Computing (UK)	2018-
	National Science Centre (Poland)	2018-
	Dutch Research Council (Netherlands)	2019-
	Science and Technology Facilities Council (UK)	2020-
	German Academic Exchange Service (DAAD) (Germany)	2021-
National Program Office (Canada)	2022-	
<b>Editor</b>	Universe	2020-

## Organization of Scientific meetings

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<b>Building a Physical Understanding of Galaxy Evolution with Data-driven Astronomy</b>	KITP, Santa Barbara, USA	Jan. 17 - Mar. 24, 2023
<b>Machine learning for astrophysics workshop</b>	ICML 2022, Baltimore	July 22 2022
<b>Intensity mapping workshop</b>	CCA, NY, USA	Feb. 20 - 22, 2018
<b>CCA cosmology group meeting</b>	CCA, NY, USA	Jul. 2017 - Jul. 2018
<b>The non-linear Universe workshop</b>	Smartno, Slovenia	Jul. 16 - 22, 2017
<b>Workshop on neutrino physics</b>	CCA, NY, USA	Apr. 6, 2017
<b>Cosmology with 21cm workshop</b>	CCA, NY, USA	Dec. 20, 2016

## Teaching experience

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<b>Lectures on numerical cosmology</b>	Trieste Observatory, Italy	February 2015
<b>Lectures on Machine learning</b>	IRFU, Trieste, Italy	March-April 2021
<b>Lectures on Machine Learning</b>	Vatican Observatory, Vatican	June 2023

## Scientific collaborations

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<b>CAMELS</b>	Cosmology and Astrophysics with Machine Learning Simulations	core team
<b>Euclid</b>	OU-LE3 validation & verification	member
	Cosmological simulations	member
	Machine Learning for CosmoSims	co-leader
<b>PFS</b>	Cosmology working group	member
<b>SMAUG*</b>	Cosmological probes working group	co-leader
<b>SKA</b>	Cosmological simulations working group	co-leader
	21cm intensity mapping working group	member
	HI galaxy surveys working group	member
	Synergies working group	member
	Cosmology with SKA1-LOW working group	member
<b>WFIRST</b>	Science working group	member

\*<https://www.simonsfoundation.org/flatiron/center-for-computational-astrophysics/smaug>

## Software & simulations

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I am the author of the following software and simulations:

- Pylians** Python libraries designed to efficiently analyze the output of numerical simulations. Written in Python/Cython/C and publicly available.  
<https://github.com/franciscovillaescusa/Pylians3>
- HADES** Set of more than 1,000 state-of-the-art N-body and hydrodynamic simulations with massive and massless neutrinos. 6 million CPU hours. More than 200 Tb of data. Publicly available.  
<https://franciscovillaescusa.github.io/hades.html>
- Quijote** Suite of 44,100 N-body simulations designed to quantify the information content on cosmological observables and to provide enough data to train machine learning algorithms. The largest set of N-body simulations to-date. Trillions of particles, billions of halos, billions of voids, millions of summary statistics. 35 Million CPU hours. 1 Petabyte of data. Publicly available.  
<https://github.com/franciscovillaescusa/Quijote-simulations>
- CAMELS** Suite of more than 4,000 N-body and hydrodynamic simulations designed to study cosmology and astrophysics using machine learning tools. About 10 Million CPU hours. 250 Terabytes of data. In collaboration with Daniel Angles-Alcazar and Shy Genel.  
<http://camel-simulations.org/>

## Student supervision

<b>Elena Massara</b>	Graduate student (w/ Prof. Matteo Viel)	SISSA, Trieste, Italy	2013-2016
<b>Isabella Carucci</b>	Graduate student (w/ Prof. Matteo Viel)	SISSA, Trieste, Italy	2014-2016
<b>Andrej Obuljen</b>	Graduate student (w/ Prof. Matteo Viel)	SISSA, Trieste, Italy	2015-2016
<b>David Valcin</b>	Graduate student (w/ Prof. Licia Verde)	ICC, Barcelona, Spain	2017-
<b>Travis Court</b>	Undergraduate student	Allegheny college, USA	summer 2017
<b>Helen Shao</b>	High-school student	Bronx high-school of Science, USA	2018-
<b>Seda Bilaloglu Asena Derin Cengiz Atakan Okan Juan Zamudio</b>	CDS master students (with Prof. Shirley Ho)	NYU, New York, USA	2018-2019
<b>Ana Maria Delgado</b>	Undergraduate student	CUNY, New York, USA	2019-2020
<b>Sudat Khan</b>	High-school student	Stuyvesant high-school, USA	2019-
<b>Valentina La Torre</b>	Undergraduate student	CCA, New York, USA	2019-
<b>Pablo Villanueva</b>	Graduate student	IFIC, Valencia, Spain	2019-
<b>Jay Wadekar</b>	Graduate student (with Prof. Shirley Ho)	NYU, New York, USA	2019-
<b>Andrew Wu</b>	Undergraduate student (with Prof. David Spergel)	Princeton University, USA	2019-
<b>Yu Cao Elaine Cui Yuanxi Sun Kaitai Zhang</b>	CDS master students (with Prof. Shirley Ho)	NYU, New York, USA	2019-
<b>Noah Kasmanoff</b>	CDS master student (with Prof. Shirley Ho Prof. Jeremy Tinker)	NYU, New York, USA	2019-
<b>Leander Thiele</b>	Graduate student (with Prof. David Spergel)	Princeton University, USA	2019-
<b>Oliver Philcox</b>	Graduate student (with Prof. David Spergel)	Princeton University, USA	2019-
<b>Jalen Salmon</b>	Undergraduate student	Princeton University, USA	2020
<b>Jupiter Ding</b>	Undergraduate student	Princeton University, USA	2020
<b>Arnab Lahiry</b>	Undergraduate student	IISER, Tirupati, India	2022-
<b>Chaitanya Chawak</b>	Undergraduate student	IISER, Tirupati, India	2022-
<b>TonyLouis Verberi</b>	Undergraduate student	University of Toronto, Canada	2022
<b>Nicolas Echeverri</b>	Undergraduate student	University of Antioquia, Colombia	2022-
<b>Natali de Santi</b>	Graduate student	University of Sao Paulo, Brazil	2022-

<b>Subhraj Praharaj</b>	Undergraduate student	BITS, Pilani, India	2022-
<b>Avery Kim</b>	Graduate student	Columbia University, USA	2022-
<b>Nathaniel Oyeka</b>	Undergraduate student	NSBP fellow, USA	2023-
<b>Fedir Boreiko</b>	Undergraduate student	Columbia University, USA	2023-
<b>Shurui Lin</b>	Undergraduate student	University of Science and Technology, China	2023-
<b>Divij Sharma</b>	Undergraduate student	UC Berkeley, USA	2023-
<b>Oriol Castander</b>	Undergraduate student	University of Barcelona, Spain	2023-

## Invited talks

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1. **The CAMELS project** 05/02/2023  
SIMBA workshop CCA, New York, USA
2. **Learning fundamental physics with machine learning and virtual universes** 04/28/2023  
SPS colloquium University of Connecticut
3. **Simulation-based inference for cosmology** 02/14/2023  
IAU-IAA seminar Remote
4. **Unveiling the nature of dark matter with deep learning** 11/29/2022  
Dark cosmos seminar Princeton University
5. **Cosmology in the machine learning era** 11/18/2022  
IID 2022; workshop and winter school Lake Guntersville, Alabama
6. **Cosmology in the machine learning era** 11/01/2022  
Department of theoretical physics colloquium, TIFR, Mumbai, India remote
7. **The CAMELS project** 10/19/2022  
UPenn seminar University of Pennsylvania
8. **Machine learning in astrophysics and cosmology** 09/21/2022  
Nature Review Physics, The Alan Turing Institute remote
9. **Towards optimal likelihood-free inference for cosmology with deep learning** 06/27/2022  
Interpretable and higher-order statistics for late time cosmology workshop, IFPU, Trieste remote
10. **Cosmology in the machine learning era** 05/06/2022  
IberICOS 2022 ICE, Barcelona
11. **Cosmology in the machine learning era** 04/13/2022  
TH Cosmo Coffee, CERN Remote
12. **The CAMELS project** 04/12/2022  
BCCP cosmology seminar, Berkeley Remote
13. **The CAMELS project** 04/12/2022  
Data-Science Astro seminar, Yale Remote
14. **The dawn of cosmology's AI revolution** 03/24/2022  
AI For Good Remote
15. **The CAMELS project** 03/02/2022  
Penn State University Colloquium Remote

16. <b>Cosmology with one galaxy</b> Bahcall lunch	03/01/2022 Princeton University
17. <b>The role of super-resolution in cosmology and astrophysics</b> AISR2022 conference	02/23/2022 Carnegie Mellon University
18. <b>Cosmology in the machine learning era</b> Missouri S&T colloquium	02/03/2022 Remote
19. <b>The role of simulations and machine learning in astrophysics</b> Sazerac conference	02/03/2022 Remote
20. <b>The Cosmology and Astrophysics with MachinE Learning Simulations project</b> Minerva seminar, Paris	02/01/2022 Remote
21. <b>Cosmology at different scales</b> Cambridge University, LSS discussion group	01/27/2022 Remote
22. <b>The Cosmology and Astrophysics with MachinE Learning Simulations project</b> IAC Canary Island seminar	12/16/2021 Remote
23. <b>The Cosmology and Astrophysics with MachinE Learning Simulations project</b> IPMU APEC seminar	12/15/2021 Remote
24. <b>The Cosmology and Astrophysics with MachinE Learning Simulations project</b> Fermilab CPC seminar	11/29/2021 Remote
25. <b>The Cosmology and Astrophysics with MachinE Learning Simulations project</b> UConn colloquium	11/12/2021 Remote
26. <b>Cosmology in the machine learning era</b> First MODE Workshop on Differentiable Programming	09/07/2021 Remote
27. <b>Can we trust predictions from super-intelligent machines?</b> Philosophical Aspects of Simulations in Cosmology	08/10/2021 Remote
28. <b>Cosmology in the Machine Learning Era</b> APS 2021	04/18/2021 Remote
29. <b>Building the cosmological rosetta stone</b> ITC Harvard, colloquium	01/07/2021 Remote
30. <b>Cosmology in the Machine Learning Era</b> UC Santa Cruz colloquium	01/20/2021 Remote
31. <b>Cosmology in the Machine Learning Era</b> CTAC, Zurich	01/07/2021 Remote
32. <b>Cosmology in the Machine Learning Era</b> University of British Columbia colloquium	12/07/2020 Remote
33. <b>Cosmology in the Machine Learning Era</b> Theory seminar, University of Geneva	12/04/2020 Remote
34. <b>CAMELS: Cosmology and Astrophysics with MachinE Learning Simulations</b> Harvard group meeting	11/02/2020 Remote
35. <b>Cosmology in the Machine Learning Era</b> Waterloo Center for Astrophysics seminar	10/21/2020 Remote
36. <b>Cosmology in the Machine Learning Era</b> Theory seminar	11/12/2019 Madison, USA
37. <b>Cosmology in the Machine Learning Era</b> Michigan Tech Physics colloquium	10/24/2019 Houghton, USA

38. **The Universe: the most sensitive neutrino mass detector** 05/11/2019  
Invisibles 2019 conference Valencia, Spain
39. **Weighing neutrinos on the sky** 04/19/2019  
Sun Yat-Sen University seminar Zhuhai, China
40. **Weighing neutrinos on the sky** 04/16/2019  
SJTU seminar Shanghai, China
41. **Quantifying the information content on high-order statistics** 04/11/2019  
PTChat@Kyoto Kyoto, Japan
42. **Towards a  $5\sigma$  detection on the sum of the neutrino masses** 04/08/2019  
CEA Saclay seminar Saclay, Paris, France
43. **Towards a  $5\sigma$  constraint on the sum of the neutrino masses** 03/19/2019  
ITC seminar Harvard University, USA
44. **Cosmology with 21cm intensity mapping** 03/07/2019  
Cosmology on Safari 2019 Hluhluwe, South Africa
45. **Towards a  $5\sigma$  detection on the sum of the neutrino masses** 02/25/2019  
IPMU seminar Tokyo, Japan
46. **Towards a  $5\sigma$  constraint on the sum of the neutrino masses** 01/29/2019  
Cosmology seminar UC Berkeley, USA
47. **Cosmology and astrophysics with cosmic neutral hydrogen** 01/18/2019  
Tsinghua University colloquium Beijing, China
48. **Constraining neutrino masses with a single Universe** 10/23/2018  
Methods for statistical inference conference IHP, Paris, France
49. **Weighing neutrinos with  $\text{Ly}\alpha$ -forest voids** 09/25/2018  
Cosmology with cosmic voids workshop CCA, New York, USA
50. **Ingredients for 21cm intensity mapping** 09/18/2018  
21cm cosmology workshop Pingtang, China
51. **Weighing neutrinos with cosmological observables** 09/06/2018  
Cosmology seminar Perimeter Institute, Canada
52. **Weighing neutrinos with cosmological observables** 08/08/2018  
Fermilab colloquium Fermilab, USA
53. **Hydrodynamic simulations of neutral hydrogen** 07/31/2018  
Tremendous radio-arrays workshop BNL, USA
54. **Ingredients for 21cm intensity mapping** 07/15/2018  
The non-linear Universe 2018 workshop Smartno, Slovenia
55. **Weighing neutrinos with cosmic HI** 06/07/2018  
PASCOS 2018 conference Case Western Reserve University, USA
56. **Cosmology with neutral hydrogen** 04/18/2018  
CITA seminar CITA, Toronto, Canada
57. **Cosmology with neutral hydrogen** 02/16/2018  
BNL seminar BNL, USA
58. **The impact of massive neutrinos of cosmological observables** 02/09/2018  
KICP seminar KICP, Chicago, USA
59. **Weighing neutrinos with cosmic HI** 11/07/2017  
The SKA radio-telescope workshop IFIC, Valencia, Spain



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| 60. <b>The imprint of neutrinos on clustering in redshift-space</b> ( <i>organizer</i> ) | 07/21/2017                      |
| The non-linear Universe 2017 workshop  | Smartno, Slovenia               |
| 61. <b>21cm cosmology</b>  | 04/20/2017                      |
| Cosmology seminar  | Brown University, USA           |
| 62. <b>Neutrino masses in cosmology</b>  | 04/10/2017                      |
| Princeton Cosmology lunch  | Princeton University, USA       |
| 63. <b>Weighing neutrinos with cosmological observables</b>                              | 03/23/2017                      |
| YITP seminar   | Stony Brook University, USA     |
| 64. <b>Massive neutrinos and large-scale structure: forecasts for SKA</b>                | 02/01/2017                      |
| Upenn seminar  | Upenn, USA                      |
| 65. <b>Neutrinos, intensity mapping and LSS</b>  | 01/27/2017                      |
| CCA Flatiron symposium   | CCA, New York, USA              |
| 66. <b>Simulating HI: WDM, neutrinos and BAO</b>   | 01/11/2017                      |
| Cosmology with neutral hydrogen workshop   | Berkeley University, USA        |
| 67. <b>Impact of neutrino masses on the Universe's large scale-structure</b>             | 11/15/2016                      |
| Cosmology seminar  | Johns Hopkins University, USA   |
| 68. <b>Impact of neutrino masses on the Universe LSS</b>                                 | 07/12/2016                      |
| Theoretical challenges for precision galaxy clustering workshop                          | Sesto, Italy                    |
| 69. <b>Precision cosmology with radial BAO from intensity mapping</b>                    | 07/04/2016                      |
| BAO & RSD: dark light on obscure acronyms workshop                                       | Sesto, Italy                    |
| 70. <b>Impact of neutrino masses on the Universe's large-scale structure</b>             | 06/22/2016                      |
| Neutrino and light particles in cosmology workshop                                       | Berkeley University, USA        |
| 71. <b>Cosmological constraints on neutrino properties</b>                               | 05/31/2016                      |
| PhyStat- $\nu$ workshop  | IPMU, Tokio, Japan              |
| 72. <b>Massive neutrino signatures on the Universe's large-scale structure</b>           | 02/24/2016                      |
| Cosmology seminar  | Helsinki, Finland               |
| 73. <b>The effect of massive neutrinos on the Universe's large-scale structure</b>       | 12/15/2015                      |
| 28th Texas Symposium on Relativistic Astrophysics  | Geneva, Switzerland             |
| 74. <b>Massive neutrinos signatures on the Universe's large-scale structure</b>          | 09/18/2015                      |
| Cosmology and particle physics seminar   | Geneva University, Switzerland  |
| 75. <b>Precision cosmology with 21cm intensity mapping</b>                               | 08/31/2015                      |
| From inflation to galaxies workshop  | Castiglioncello, Italy          |
| 76. <b>Weighing neutrinos with cosmology</b>   | 07/07/2015                      |
| Galaxy Clustering within Euclid OULE3 workshop   | Sesto, Italy                    |
| 77. <b>21cm cosmology</b>  | 02/18/2015                      |
| Cosmology seminar  | Brera Observatory, Milan, Italy |
| 78. <b>Cosmology with neutral hydrogen</b>   | 02/03/2015                      |
| 5th Hydrosim workshop  | Trieste Observatory, Italy      |
| 79. <b>Small scale structures and neutrino masses</b>                                    | 09/10/2014                      |
| Neutrino Oscillation Workshop  | Otranto, Lecce, Italy           |
| 80. <b>The impact of massive neutrinos on halo bias</b>                                  | 09/24/2013                      |
| 4th Hydrosim meeting   | OATS, Trieste, Italy            |
| 81. <b>Massive neutrinos simulations</b>   | 01/11/2013                      |
| 3rd Hydrosim meeting   | OATS, Trieste, Italy            |

82. **The Non-linear evolution of the neutrino cosmic background**  
ICTP seminar
83. **The impact of neutrino masses on cosmology**  
Cosmology seminar

12/04/2012  
ICTP, Trieste, Italy

04/18/2012  
OATS, Trieste, Italy

## References

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<b>Prof. Stefano Borgani</b>	Trieste Observatory, Italy	<a href="mailto:borgani@oats.inaf.it">borgani@oats.inaf.it</a>
<b>Prof. Neal Dalal</b>	Perimeter Institute, Canada	<a href="mailto:ndalal@perimeterinstitute.ca">ndalal@perimeterinstitute.ca</a>
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<b>Dr. Emiliano Sefusatti</b>	Trieste Observatory, Italy	<a href="mailto:sefusatti@oats.inaf.it">sefusatti@oats.inaf.it</a>
<b>Prof. David N. Spergel</b>	CCA/Princeton University, USA	<a href="mailto:dspergel@flatironinstitute.org">dspergel@flatironinstitute.org</a>
<b>Prof. Licia Verde</b>	ICC, Barcelona, Spain	<a href="mailto:liciaverde@icc.ub.edu">liciaverde@icc.ub.edu</a>
<b>Prof. Matteo Viel</b>	SISSA, Italy	<a href="mailto:viel@sissa.it">viel@sissa.it</a>

# PUBLICATIONS

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- 1. Signatures of a Parity-Violating Universe**  
William R. Coulton, Oliver H. E. Philcox, Francisco Villaescusa-Navarro  
June 2023 [[astro-ph/2306.11782](#)]
- 2. Quijote-PNG: The Information Content of the Halo Mass Function**  
Gabriel Jung, Andrea Ravenni, Marco Baldi, William R. Coulton, Drew Jamieson, Dionysios Karagiannis, Michele Liguori, Helen Shao, Licia Verde, Francisco Villaescusa-Navarro, Benjamin D. Wandelt  
May 2023 [[astro-ph/2305.10597](#)]
- 3. Inferring Warm Dark Matter Masses with Deep Learning**  
Jonah C. Rose, Paul Torrey, Francisco Villaescusa-Navarro, Mark Vogelsberger, Stephanie O'Neil, Mikhail V. Medvedev, Ryan Low, Rakshak Adhikari, Daniel Angles-Alcazar  
April 2023 [[astro-ph/2304.14432](#)]
- 4. Cosmology with one galaxy? – The ASTRID model and robustness**  
Nicolas Echeverri, Francisco Villaescusa-Navarro, Chaitanya Chawak, Yueying Ni, ChangHoon Hahn, Elena Hernandez-Martinez, Romain Teyssier, Daniel Angles-Alcazar, Klaus Dolag, Tiago Castro  
April 2023 [[astro-ph/2304.06084](#)]
- 5. The CAMELS project: Expanding the galaxy formation model space with new ASTRID and 28-parameter TNG and SIMBA suites**  
Yueying Ni, Shy Genel, Daniel Angles-Alcazar, Francisco Villaescusa-Navarro, Yongseok Jo, Simeon Bird, Tiziana Di Matteo, Rupert Croft, Nianyi Chen, Natal  S. M. de Santi, Matthew Gebhardt, Helen Shao, Shivam Pandey, Lars Hernquist, Romeel Dave  
April 2023 [[astro-ph/2304.02096](#)]
- 6. Invertible mapping between fields in CAMELS**  
Sambatra Andrianomena, Sultan Hassan, Francisco Villaescusa-Navarro  
March 2023 [[astro-ph/2303.07473](#)]
- 7. A universal equation to predict  $\Omega_m$  from halo and galaxy catalogues**  
Helen Shao, Natal  S. M. de Santi, Francisco Villaescusa-Navarro, Romain Teyssier, Yueying Ni, Daniel Angles-Alcazar, Shy Genel, Lars Hernquist, Ulrich P. Steinwandel, Tiago Castro, Elena Hernandez-Martinez, Klaus Dolag, Christopher C. Lovell, Eli Visbal, Lehman H. Garrison, Mihir Kulkarni  
February 2023 [[astro-ph/2302.14591](#)]
- 8. Robust field-level likelihood-free inference with galaxies**  
Natal  S. M. de Santi, Helen Shao, Francisco Villaescusa-Navarro, L. Raul Abramo, Romain Teyssier, Pablo Villanueva-Domingo, Yueying Ni, Daniel Angles-Alcazar, Shy Genel, Elena Hernandez-Martinez, Ulrich P. Steinwandel, Christopher C. Lovell, Klaus Dolag, Tiago Castro, Mark Vogelsberger  
February 2023 [[astro-ph/2302.14101](#)]
- 9. Predicting the impact of feedback on matter clustering with machine learning in CAMELS**  
Ana Maria Delgado, Daniel Angles-Alcazar, Leander Thiele, Michelle Ntampaka, Shivam Pandey, Kai Lehman, Rachel S. Somerville, Shy Genel, Francisco Villaescusa-Navarro  
January 2023 [[astro-ph/2301.02231](#)]
- 10. Inferring the impact of feedback on the matter distribution using the Sunyaev Zel'dovich effect: Insights from CAMELS simulations and ACT+DES data**

Shivam Pandey, Kai Lehman, Eric J. Baxter, Yueying Ni, Daniel Angles-Alcazar, Shy Genel, Francisco Villaescusa-Navarro, Ana Maria Delgado, Tiziana di Matteo  
January 2023 [[astro-ph/2301.02186](#)]

11. **Machine learning cosmology from void properties**  
Bonny Y. Wang, Alice Pisani, Francisco Villaescusa-Navarro, Benjamin D. Wandelt  
December 2022 [[astro-ph/2212.06860](#)]
12. **Calibrating cosmological simulations with implicit likelihood inference using galaxy growth observables**  
Yongseok Jo, Shy Genel, Benjamin Wandelt, Rachel Somerville, Francisco Villaescusa-Navarro, Greg L. Bryan, Daniel Angles-Alcazar, Daniel Foreman-Mackey, Dylan Nelson, Ji-hoon Kim  
November 2022 [[astro-ph/2211.16461](#)]
13. **Euclid: Modelling massive neutrinos in cosmology – a code comparison**  
Julian Adamek et al.  
November 2022 [[astro-ph/2211.12457](#)]
14. **Quijote-PNG: Quasi-maximum likelihood estimation of Primordial Non-Gaussianity in the non-linear halo density field**  
Gabriel Jung, Dionysios Karagiannis, Michele Liguori, Marco Baldi, William R Coulton, Drew Jamieson, Licia Verde, Francisco Villaescusa-Navarro, Benjamin D. Wandelt  
November 2022 [[astro-ph/2211.07565](#)]
15. **Emulating cosmological multifields with generative adversarial networks**  
Sambatra Andrianomena, Francisco Villaescusa-Navarro, Sultan Hassan  
November 2022 [[astro-ph/2211.05000](#)]
16. **Robust field-level inference with dark matter halos**  
Helen Shao, Francisco Villaescusa-Navarro, Pablo Villanueva-Domingo, Romain Teyssier, Lehman H. Garrison, Marco Gatti, Derek Inman, Yueying Ni, Ulrich P. Steinwandel, Mihir Kulkarni, Eli Visbal, Greg L. Bryan, Daniel Angles-Alcazar, Tiago Castro, Elena Hernandez-Martinez, Klaus Dolag  
September 2022 [[astro-ph/2209.06843](#)]
17. **The SZ flux-mass (Y-M) relation at low halo masses: improvements with symbolic regression and strong constraints on baryonic feedback**  
Digvijay Wadekar, Leander Thiele, J. Colin Hill, Shivam Pandey, Francisco Villaescusa-Navarro, David N. Spergel, Miles Cranmer, Daisuke Nagai, Daniel Angles-Alcazar, Shirley Ho, Lars Hernquist  
September 2022 [[astro-ph/2209.02075](#)]
18. **Studying the Warm Hot Intergalactic Medium in emission: a reprise**  
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PRL, 127, 13, (2021) DOI: 10.1103/PhysRevLett.127.131102

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ApJ, 919, 1, (2021) DOI: 10.3847/1538-4357/ac0e91

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MNRAS, 505, 1, (2021)  
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ApJ, 928, 44, (2022)  
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ApJS, 915, 1, (2021)  
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MNRAS, 503, 2, (2021)  
DOI: 10.1093/mnras/stab430
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DOI: 10.1088/1475-7516/2021/03/022
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July 2020, 27 pp. [[astro-ph/2007.10345](#)]  
JCAP, 01, 009, (2021)  
DOI: 10.1088/1475-7516/2021/01/009



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ApJ, 907, 1, (2021)  
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PRD 102, 103506 (2020)  
DOI: 10.1103/PhysRevD.102.103506
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PRD 101, 123520 (2020)  
DOI: 10.1103/PhysRevD.101.123520
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Elena Massara, [Francisco Villaescusa-Navarro](#), Shirley Ho, Neal Dalal, David N. Spergel  
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PRL, 126, 1, (2021)  
DOI: 10.1103/PhysRevLett.126.011301
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MNRAS, 495, 4, (2020)  
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MNRAS, 498, 1, (2020)  
DOI: 10.1093/mnras/staa2160
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MNRAS, 495, 4, (2020)  
DOI: 10.1093/mnras/staa1155
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JCAP, 03, 040, (2020)  
DOI: 10.1088/1475-7516/2020/03/040
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September 2019, 19 pp. [[astro-ph/1909.05273](#)]  
ApJS, 250, 1, (2020)  
DOI: 10.3847/1538-4365/ab9d82
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White paper for Astro2020 decadal survey
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Arka Banerjee, Emanuele Castorina, [Francisco Villaescusa-Navarro](#), Travis Court, Matteo Viel  
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JCAP, 06, 032, (2020)  
DOI: 10.1088/1475-7516/2020/06/032
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ApJ submitted
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NeurIPS 2019 Machine Learning and the Physical Science Workshop accepted
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Weygaert, Francisco Villaescusa-Navarro, Benjamin D. Wandelt, Yun Wang  
March 2019, 5 pp. [[astro-ph/1903.05161](#)]  
White paper for Astro2020 decadal survey

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Cora Dvorkin, Martina Gerbino, David Alonso, Nicholas Battaglia, Simeon Bird, Ana Diaz Rivero, Andreu Font-Ribera, George Fuller, Massimiliano Lattanzi, Marilena Loverde, Julian B. Munoz, Blake Sherwin, Anze Slosar, Francisco Villaescusa-Navarro  
March 2019, 5 pp. [[astro-ph/1903.03689](#)]  
White paper for Astro2020 decadal survey

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Feb 2019, 22 pp. [[astro-ph/1902.10714](#)]  
MNRAS, 487, 2, (2019)  
DOI: 10.1093/mnras/stz1323

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David Valcin, Francisco Villaescusa-Navarro, Licia Verde, Alvise Raccanelli  
January 2019, 33 pp. [[astro-ph/1901.06045](#)]  
JCAP, 12, 57, (2019)  
DOI: 10.1088/1475-7516/2019/12/057

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Derek Inman, Ue-Li Pen, Francisco Villaescusa-Navarro  
November 2018, 10 pp. [[astro-ph/1812.02148](#)]  
MNRAS, 487, 3, (2019)  
DOI: 10.1093/mnras/stz1542

**87. First detection of scale-dependent linear halo bias in N-body simulations with massive neutrinos**

Chi-Ting Chiang, Marilena LoVerde, Francisco Villaescusa-Navarro  
November 2018, 4 pp. [[astro-ph/1811.12412](#)]  
PRL, 122, 041302, (2019)  
DOI: 10.1103/PhysRevLett.122.041302

**88. Measuring the EoR Power Spectrum Without Measuring the EoR Power Spectrum**

Angus Beane, Francisco Villaescusa-Navarro, Adam Lidz  
November 2018, 9 pp. [[astro-ph/1811.10609](#)]  
ApJ, 874, 2, (2019)  
DOI: 10.3847/1538-4357/ab0a08

**89. Cosmology with Phase 1 of the Square Kilometre Array**

Square Kilometre Array Cosmology Science Working Group: David J. Bacon, Richard A. Battye, Philip Bull, Stefano Camera, Pedro G. Ferreira, Ian Harrison, David Parkinson, Alkistis Pourtsidou, Mario G. Santos, Laura Wolz, Filipe Abdalla, Yashar Akrami, David Alonso, Sambatra Andrianomena, Mario Ballardini, Jose Luis Bernal, Daniele Bertacca, Carlos A.P. Bengaly, Anna Bonaldi, Camille Bonvin, Michael L. Brown, Emma Chapman, Song Chen, Xuelei Chen, Steven Cunnington, Tamara M. Davis, Clive Dickinson, Jose Fonseca, Keith Grainge, Stuart Harper, Matt J. Jarvis, Roy Maartens, Natasha Maddox, Hamsa Padmanabhan, Jonathan R. Pritchard, Alvise Raccanelli, Marzia Rivi, Sambit Roychowdhury, Martin Sahlen, Dominik J. Schwarz, Thilo M. Siewert, Matteo Viel, Francisco Villaescusa-Navarro, Yidong Xu, Daisuke Yamauchi, Joe Zuntz  
November 2018, 35 pp. [[astro-ph/1811.02743](#)]  
Submitted to Publications of the Astronomical Society of Australia

**90. Suppressed Variance in Ly $\alpha$  Forest Simulations**

Lauren Anderson, Andrew Pontzen, Andreu Font-Ribera, Francisco Villaescusa-Navarro, Keir K. Rogers, Shy Genel  
November 2018, 15 pp. [[astro-ph/1811.00043](#)]  
ApJ, 871, 2, (2019)  
DOI: 10.3847/1538-4357/aaf576

91. **Inflation and Early Dark Energy with a Stage II Hydrogen Intensity Mapping experiment**  
Reza Ansari, Evan J. Arena, Kevin Bandura, Philip Bull, Emanuele Castorina, Tzu-Ching Chang, Simon Foreman, Josef Frisch, Daniel Green, Dionysios Karagiannis, Adrian Liu, Kiyoshi W. Masui, P. Daniel Meerburg, Laura B. Newburgh, Andrej Obuljen, Paul O'Connor, J. Richard Shaw, Christopher Sheehy, Anze Slosar, Kendrick Smith, Paul Stankus, Albert Stebbins, Peter Timbie, [Francisco Villaescusa-Navarro](#), Martin White  
October 2018, 73 pp. [[astro-ph/1810.09572](#)]  
Submitted to Physics Reports
92. **Fundamental Physics with the Square Kilometre Array**  
P. Bull, Stefano Camera, K. Kelley, H. Padmanabhan, J. Pritchard, A. Racanelli, S. Riemer-Sorensen, L. Shao, S. Andrianomena, E. Athanassoula, D. Bacon, R. Barkana, G. Bertone, C. Bonvin, A. Bosma, M. Bruggen, C. Burigana, C. Boehm, F. Calore, J. A. R. Cembranos, C. Clarkson, R. M. T. Connors, A. de la Cruz-Dombriz, P. K. S. Dunsby, N. Fornengo, D. Gaggero, I. Harrison, J. Larena, Y.-Z. Ma, R. Maartens, M. Mendez-Isla, S. D. Mohanty, S. G. Murray, D. Parkinson, A. Pourtsidou, P. J. Quinn, M. Regis, P. Saha, M. Sahlen, M. Sakellariadou, J. Silk, T. Trombetti, F. Vazza, T. Venumadhav, F. Vidotto, [F. Villaescusa-Navarro](#), Y. Wang, C. Weniger, L. Wolz, F. Zhang, B. M. Gaensler, A. Weltman  
October 2018, 70 pp. [[astro-ph/1810.02680](#)]  
Publications of the Astronomical Society of Australia, 37, e002, (2020)
93. **Extreme Spheres: Counts-in-cells for 21cm intensity mapping**  
Oliver Leicht, Cora Uhlemann, [Francisco Villaescusa-Navarro](#), Sandrine Codis, Lars Hernquist, Shy Genel  
August 2018, 12 pp. [[astro-ph/1808.09968](#)]  
MNRAS, 484, 1, (2019)  
DOI: 10.3847/1538-4357/aaf576
94. **Modeling the atomic-to-molecular transition in cosmological simulations of galaxy formation**  
Benedikt Diemer, Adam R. H. Stevens, John C. Forbes, Federico Marinacci, Lars Hernquist, Claudia del P. Lagos, Amiel Sternberg, Annalisa Pillepich, Dylan Nelson, Gergo Popping, [Francisco Villaescusa-Navarro](#), Paul Torrey, Mark Vogelsberger  
June 2018, 21 pp. [[astro-ph/1806.02341](#)]  
ApJS, 238, 2, (2018)  
DOI: 10.3847/1538-4365/aae387
95. **Statistical properties of paired fixed fields**  
[Francisco Villaescusa-Navarro](#), Sigurd Naess, Shy Genel, Andrew Pontzen, Benjamin Wandelt, Lauren Anderson, Andreu Font-Ribera, Nicholas Battaglia, David N. Spergel  
June 2018, 24 pp. [[astro-ph/1806.01871](#)]  
ApJ 867, 2, (2018)  
DOI: 10.3847/1538-4357/aae52b
96. **The kinematic Sunyaev-Zel'dovich effect of the large-scale structure (II): the effect of modified gravity**  
Mauro Roncarelli, Marco Baldi, [Francisco Villaescusa-Navarro](#)  
May 2018, 11 pp. [[astro-ph/1805.11607](#)]  
MNRAS 481, 2, (2018)  
DOI: 10.1093/mnras/sty2225
97. **The HI content of dark matter halos at  $z \approx 0$  from ALFALFA**  
Andrej Obuljen, David Alonso, [Francisco Villaescusa-Navarro](#), Ilsang Yoon, Michael Jones  
May 2018, 17 pp. [[astro-ph/1805.00934](#)]  
MNRAS, 486, 4, (2019)  
DOI: 10.1093/mnras/stz1118
98. **Ingredients for 21cm intensity mapping**  
[Francisco Villaescusa-Navarro](#), Shy Genel, Emanuele Castorina, Andrej Obuljen, David N. Spergel, Lars Hernquist, Dylan Nelson, Isabella P. Carucci, Annalisa Pillepich, Federico Marinacci, Benedikt Diemer, Mark Vogelsberger, Rainer Weinberger, Rudiger Pakmor  
April 2018, 41 pp. [[astro-ph/1804.09180](#)]  
ApJ 866, 2, (2018)  
DOI: 10.3847/1538-4357/aadba0
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Emanuele Castorina, Yu Feng, Uros Seljak, [Francisco Villaescusa-Navarro](#)  
March 2018, 6 pp. [[astro-ph/1803.11539](#)]  
PRL, 121, 10, (2018)  
DOI: 10.1103/PhysRevLett.121.101301

100. **Reducing Noise in Cosmological N-body Simulations with Neutrinos**  
Arka Banerjee, Devon Powell, Tom Abel, [Francisco Villaescusa-Navarro](#)  
January 2018, 26 pp. [[astro-ph/1801.03906](#)]  
JCAP, 09, 028, (2018)  
DOI: 10.1088/1475-7516/2018/09/028
101. **Line-Intensity Mapping: 2017 Status Report**  
Ely D. Kovetz, Marco P. Viero, Adam Lidz, Laura Newburgh, Mubdi Rahman, Eric Switzer, Marc Kamionkowski, James Aguirre, Marcelo Alvarez, James Bock, J. Richard Bond, Geoffry Bower, C. Matt Bradford, Patrick C. Breyse, Philip Bull, Tzu-Ching Chang, Yun-Ting Cheng, Dongwoo Chung, Kieran Cleary, Asantha Corray, Abigail Crites, Rupert Croft, Olivier Dore, Michael Eastwood, Andrea Ferrara, Jose Fonseca, Daniel Jacobs, Garrett K. Keating, Guilaine Lagache, Gunjan Lakhani, Adrian Liu, Kavilan Moodley, Norm Murray, Aurelie Penin, Gergo Popping, Anthony Pullen, Dominik Reichers, Shun Saito, Ben Saliwanchik, Mario Santos, Rachel Somerville, Gordon Stacey, George Stein, [Francisco Villaescusa-Navarro](#), Eli Visbal, Amanda Weltman, Laura Wolz, Micheal Zemcov  
September 2017, 99 pp. [[astro-ph/1709.09066](#)]
102. **High-redshift post-reionisation cosmology with 21cm intensity mapping**  
Andrej Obuljen, Emanuele Castorina, [Francisco Villaescusa-Navarro](#), Matteo Viel  
September 2017, 37 pp. [[astro-ph/1709.07893](#)]  
JCAP, 05, 004, (2018)  
DOI: 10.1088/1475-7516/2018/05/004
103. **The imprint of neutrinos on clustering in redshift-space**  
[Francisco Villaescusa-Navarro](#), Arka Banerjee, Neal Dalal, Emanuele Castorina, Roman Scoccimarro, Raul Angulo, David N. Spergel  
August 2017, 19 pp. [[astro-ph/1708.01154](#)]  
ApJ, 861, 1 (2018)  
DOI: 10.3847/1538-4357/aac6bf
104. **Biases from neutrino bias: to worry or not to worry?**  
Alvise Raccanelli, Licia Verde, [Francisco Villaescusa-Navarro](#)  
April 2017, 11pp. [[astro-ph/1704.07837](#)]  
MNRAS 483, 1, (2019)  
DOI: 10.1093/mnras/sty2162
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Mauro Roncarelli, [Francisco Villaescusa-Navarro](#), Marco Baldi  
February 2017, 11 pp. [[astro-ph/1702.00676](#)]  
MNRAS, 467, 985, (2017)  
DOI: 10.1093/mnras/stx170
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Alexie Leauthaud, Shun Saito, Stefan Hilbert, Alexandre Barreira, Surhud More, Martin White, Shadab Alam, Peter Behroozi, Kevin Bundy, Jean Coupon, Thomas Erben, Catherine Heymans, Hendrik Hildebrandt, Rachel Mandelbaum, Lance Miller, Bruno Moraes, Maria E. S. Pereira, Sergio A. Rodriguez-Torres, Fabian Schmidt, Huan-Yuan Shan, Matteo Viel, [Francisco Villaescusa-Navarro](#)  
November 2016, 26 pp. [[astro-ph/1611.08606](#)]  
MNRAS, 467, 3024, (2017)  
DOI: 10.1093/mnras/stx258
107. **The cross-correlation between 21cm intensity mapping maps and the Lyman-alpha forest in the post-reionization era**  
Isabella P. Carucci, [Francisco Villaescusa-Navarro](#), Matteo Viel  
November 2016, 31 pp. [[astro-ph/1611.07527](#)]  
JCAP, 04, 001, (2017)  
DOI: 10.1088/1475-7516/2017/04/001
108. **Accurate initial conditions in mixed Dark Matter–Baryon simulations**  
Wessel Valkenburg, [Francisco Villaescusa-Navarro](#)  
October 2016, 10 pp. [[astro-ph/1610.08501](#)]  
MNRAS, 467, 4401, (2017)  
DOI: 10.1093/mnras/stx376

109. **Baryon Acoustic Oscillations reconstruction with pixels**  
Andrej Obuljen, [Francisco Villaescusa-Navarro](#), Emanuele Castorina, Matteo Viel  
October 2016, 30 pp. [[astro-ph/1610.05768](#)]  
JCAP, 09, 012, (2017)  
DOI: 10.1088/1475-7516/2017/09/012
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Emanuele Castorina, [Francisco Villaescusa-Navarro](#)  
September 2016, 10 pp. [[astro-ph/1609.05157](#)]  
MNRAS, 471, 1788, (2017)  
DOI: 10.1093/mnras/stx1599
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[Francisco Villaescusa-Navarro](#), David Alonso, Matteo Viel  
September 2016, 17 pp. [[astro-ph/1609.00019](#)]  
MNRAS, 466, 2736, (2017)  
DOI: 10.1093/mnras/stw3224
112. **Cosmic degeneracies II: Structure formation in joint simulations of Warm Dark Matter and f(R) gravity**  
Marco Baldi, [Francisco Villaescusa-Navarro](#)  
August 2016, 14 pp. [[astro-ph/1608.08057](#)]  
MNRAS, 473, 3226, (2018)  
DOI: 10.1093/mnras/stx2594
113. **Initial Conditions for Accurate N-Body Simulations of Massive Neutrino Cosmologies**  
Matteo Zennaro, Julien Bel, [Francisco Villaescusa-Navarro](#), Carmelita Carbone, Emiliano Sefusatti, Luigi Guzzo  
May 2016, 15 pp. [[astro-ph/1605.05283](#)]  
MNRAS, 466, 3244, (2017)  
DOI: 10.1093/mnras/stw3340
114. **Simulating cosmologies beyond  $\Lambda$ CDM with PINOCCHIO**  
Luca A. Rizzo, [Francisco Villaescusa-Navarro](#), Pierluigi Monaco, Emiliano Munari, Stefano Borgani, Emanuele Castorina, Emiliano Sefusatti  
February 2016, 23 pp. [[astro-ph/1610.07624](#)]  
JCAP, 01, 008, (2017)  
DOI: 10.1088/1475-7516/2017/01/008
115. **Beyond  $\Lambda$ CDM: Problems, solutions, and the road ahead**  
Philip Bull, Yashar Akrami, Julian Adamek, Tessa Baker, Emilio Bellini, Jose Beltran Jimenez, Eloisa Bentivegna, Stefano Camera, Sebastien Clesse, Jonathan H. Davis, Enea Di Dio, Jonas Enander, Fabio Finelli, Alan Heavens, Lavinia Heisenberg, Bin Hu, Claudio Llinares, Roy Maartens, Edvard Mörtsell, Seshadri Nadathur, Johannes Noller, Roman Pasechnik, Marcel S. Pawlowski, Thiago S. Pereira, Miguel Quartin, Angelo Ricciardone, Signe Riemer-Sørensen, Massimiliano Rinaldi, Jeremy Sakstein, Ippocratis D. Saltas, Vincenzo Salzano, Ignacy Sawicki, Adam R. Solomon, Douglas Spolyar, Glenn D. Starkman, Daniele Steer, Ismael Tereno, Licia Verde, [Francisco Villaescusa-Navarro](#), Mikael von Strauss, Hans A. Winther  
December 2015, 97 pp. [[astro-ph/1512.05356](#)]  
Physics of the Dark Universe 12 (2016) 56-99  
DOI: 10.1016/j.dark.2016.02.001
116. **Neutral hydrogen in galaxy clusters: impact of AGN feedback and implications for intensity mapping**  
[Francisco Villaescusa-Navarro](#), Susana Planelles, Stefano Borgani, Matteo Viel, Elena Rasia, Giuseppe Murante, Klaus Dolag, Lisa K. Steinborn, Veronica Biffi, Alexander M. Beck, Cinthia Ragone-Figueroa  
October 2015, 19 pp. [[astro-ph/1510.04277](#)]  
MNRAS, 456, 3553, (2016)  
DOI: 10.1093/mnras/stv2904
117. **Weighing neutrinos with cosmic neutral hydrogen**  
[Francisco Villaescusa-Navarro](#), Philip Bull, Matteo Viel  
July 2015, 20 pp. [[astro-ph/1507.05102](#)]  
ApJ, 814, 146, (2015)  
DOI: 10.1088/0004-637X/814/2/146

118. **Voids in massive neutrino cosmologies**  
Elena Massara, [Francisco Villaescusa-Navarro](#), Matteo Viel, Paul M. Sutter  
June 2015, 31 pp. [[astro-ph/1506.03088](#)]  
JCAP, 11, 018, (2015)  
DOI: 10.1088/1475-7516/2015/11/018
119. **The effect of massive neutrinos on the BAO peak**  
Marco Peloso, Massimo Pietroni, Matteo Viel, [Francisco Villaescusa-Navarro](#)  
May 2015, 26 pp. [[astro-ph/1505.07477](#)]  
JCAP, 07, 01, (2015)  
DOI: 10.1088/1475-7516/2015/07/001
120. **Warm dark matter signatures on the 21cm power spectrum: Intensity mapping forecasts for SKA**  
Isabella P. Carucci, [Francisco Villaescusa-Navarro](#), Matteo Viel, Andrea Lapi  
February 2015, 25 pp. [[astro-ph/1502.06961](#)]  
JCAP, 07, 47, (2015)  
DOI: 10.1088/1475-7516/2015/07/047
121. **Small scales structures and neutrino masses**  
[Francisco Villaescusa-Navarro](#)  
January 2015, 4 pp. [[astro-ph/1501.04546](#)]  
Nuclear and Particle Physics Proceedings, 56, 2015  
DOI: 10.1016/j.nuclphysbps.2015.06.015
122. **Cosmology with a SKA HI intensity mapping survey**  
Mario G. Santos, Philip Bull, David Alonso, Stefano Camera, Pedro G. Ferreira, Gianni Bernardi, Roy Maartens, Matteo Viel, [Francisco Villaescusa-Navarro](#), Filipe B. Abdalla, Matt Jarvis, R. Benton Metcalf, A. Pourtsidou, Laura Wolz  
January 2015, 27 pp. [[astro-ph/1501.03989](#)]  
Proceedings of Advancing Astrophysics with the Square Kilometre Array (AASKA14)  
DOI: 10.22323/1.215.0019
123. **Cross-correlating 21cm intensity maps with Lyman Break Galaxies in the post-reionization era**  
[Francisco Villaescusa-Navarro](#), Matteo Viel, David Alonso, Kanan K. Datta, Philip Bull, Mario G. Santos  
October 2014, 23 pp. [[astro-ph/1410.7393](#)]  
JCAP, 03, 34, (2015)  
DOI: 10.1088/1475-7516/2015/03/034
124. **The halo model in a massive neutrino cosmology**  
Elena Massara, [Francisco Villaescusa-Navarro](#), Matteo Viel  
October 2014, 28 pp. [[astro-ph/1410.6813](#)]  
JCAP, 12, 53, (2014)  
DOI: 10.1088/1475-7516/2014/12/053
125. **Semi-Analytic Galaxy Formation in Massive Neutrinos Cosmologies**  
Fabio Fontanot, [Francisco Villaescusa-Navarro](#), Davide Bianchi, Matteo Viel  
September 2014, 8 pp. [[astro-ph/1409.6309](#)]  
MNRAS, 447, 3361, (2015)  
DOI: 10.1093/mnras/stu2705
126. **A coarse grained perturbation theory for the Large Scale Structure, with cosmology and time independence in the UV**  
Alessandro Manzotti, Marco Peloso, Massimo Pietroni, Matteo Viel, [Francisco Villaescusa-Navarro](#)  
July 2014, 37 pp. [[astro-ph/1407.1342](#)]  
JCAP, 09, 47, (2014)  
DOI: 10.1088/1475-7516/2014/09/047
127. **VIDE: The Void IDentification and Examination toolkit**  
Paul M. Sutter, Guilhem Lavaux, Nico Hamaus, Alice Pisani, Benjamin D. Wandelt, Michael S. Warren, [Francisco Villaescusa-Navarro](#), Paul Zivick, Qingqing Mao, Benjamin B. Thompson  
June 2014. 9 pp. [[astro-ph/1406.1191](#)]  
Astronomy & Computing, 9, 1, (2015)  
DOI: 10.1016/j.ascom.2014.10.002

128. **Modeling the neutral hydrogen distribution in the post-reionization universe: intensity mapping**  
Francisco Villaescusa-Navarro, Matteo Viel, Kanan K. Datta and T. Roy Choudhury  
May 2014. 45 pp. [[astro-ph/1405.6713](#)]  
JCAP, 09, 50, (2014)  
DOI: 10.1088/1475-7516/2014/09/050
129. **Constraining Warm Dark Matter with high-z supernova lensing**  
Stefania Pandolfi, Carmelo Evoli, Andrea Ferrara and [Francisco Villaescusa-Navarro](#)  
Mar 2014. 7 pp. [[astro-ph/1403.2185](#)]  
MNRAS, 442, 13, (2014)  
DOI: 10.1093/mnras/stu785
130. **Cosmic Degeneracies I: Joint N-body Simulations of Modified Gravity and Massive Neutrinos**  
Marco Baldi, [Francisco Villaescusa-Navarro](#), Matteo Viel, Ewald Puchwein, Volker Springel and Lauro Moscardini  
Nov 2013. 14 pp. [[astro-ph/1311.2588](#)]  
MNRAS, 440, 75, (2014)  
DOI: 10.1093/mnras/stu259
131. **Cosmology with massive neutrinos III: the halo mass function and an application to galaxy clusters**  
Matteo Costanzi, [Francisco Villaescusa-Navarro](#), Matteo Viel, Jun-Qing Xia, Stefano Borgani, Emanuele Castorina and Emiliano Sefusatti.  
Nov 2013. 20 pp. [[astro-ph/1311.1514](#)]  
JCAP, 12, 012, (2013)  
DOI: 10.1088/1475-7516/2013/12/012
132. **Cosmology with massive neutrinos II: on the universality of the halo mass function and bias**  
Emanuele Castorina, Emiliano Sefusatti, Ravi K. Sheth, [Francisco Villaescusa-Navarro](#) and Matteo Viel.  
Nov 2013. 21 pp. [[astro-ph/1311.1212](#)]  
JCAP, 02, 049, (2014)  
DOI: 10.1088/1475-7516/2014/02/049
133. **Cosmology with massive neutrinos I: towards a realistic modeling of the relation between matter, haloes and galaxies**  
[Francisco Villaescusa-Navarro](#), Federico Marulli, Matteo Viel, Enzo Branchini, Emanuele Castorina, Emiliano Sefusatti and Shun Saito.  
Nov 2013. 35 pp. [[astro-ph/1311.0866](#)]  
JCAP, 03, 011, (2014)  
DOI: 10.1088/1475-7516/2014/03/011
134. **Non-linear evolution of the cosmic neutrino background**  
[Francisco Villaescusa-Navarro](#), Simeon Bird, Carlos Peña-Garay and Matteo Viel.  
Dec 2012. 24 pp. [[astro-ph/1212.4855](#)]  
JCAP, 03, 019, (2013)  
DOI: 10.1088/1475-7516/2013/03/019
135. **Neutrino Signatures on the High Transmission Regions of the Lyman-alpha Forest**  
[Francisco Villaescusa-Navarro](#), Mark Vogelsberger, Matteo Viel and Abraham Loeb.  
Jun 2011. 9 pp. [[astro-ph/1106.2543](#)]  
MNRAS, 431, 3670, (2013)  
DOI: 10.1093/mnras/stt452
136. **Neutrino Halos in Clusters of Galaxies and their Weak Lensing Signature**  
[Francisco Villaescusa-Navarro](#), Jordi Miralda-Escudé, Carlos Peña-Garay and Vicent Quilis.  
Apr 2011. 13 pp. [[astro-ph/1104.4770](#)]  
JCAP, 06, 027, (2011)  
DOI: 10.1088/1475-7516/2011/06/027
137. **Signatures of photon and axion-like particle mixing in the gamma-ray burst jet**  
Olga Mena, Soebur Razzaque and [Francisco Villaescusa-Navarro](#).  
Jan 2011. 16 pp. [[astro-ph/1101.190](#)]  
JCAP, 02, 030, (2011)  
DOI: 10.1088/1475-7516/2011/02/030



138. **Cores and cusps in warm dark matter halos**

Francisco Villaescusa-Navarro and Neal Dalal.

Oct 2010. 16 pp. [[astro-ph/1010.3008](#)]

JCAP, 03, 024, (2011)

DOI: 10.1088/1475-7516/2011/03/024