Francisco Villaescusa-Navarro
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162 5th Avenue, 10010, New York, NY, USA

New York, October 13, 2017

CURRICULUM VITAE

Personal Data

Name: Francisco Villaescusa-Navarro
Title: Ph.D. in physics.
Born: 7 August 1984, Albacete, Spain
Nationality: Spanish
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Education

Jul. 08 - May. 12	Ph.D. in Physics, Valencia University, Spain.
Sep. 07 - Jul. 08	Master in advanced physics, Valencia University, Spain.
Sep. 02 - Jul. 07	Bachelor's Degree in Physics, Valencia University, Spain. Granted with Excellence Prize in 2007

Academic and Professional Positions

Sep. 16 - present	Research fellow. Center for Computational Astrophysics. (New York, USA). Supervisor: Prof. David Spergel
Jul. 12 - Aug. 16	CosmoIGM postdoctoral fellow. (Trieste, Italy). Supervisor: Prof. Matteo Viel
Jan. 08 - Jun. 12	Ph.D. student. JAE predoctoral fellow.(Valencia, Spain). Supervisor: Dr. Carlos Peña-Garay
Jul. 10 - Aug 11	Visiting Graduate Student at Institute for Theory and Computation, Harvard-Smithsonian center for Astrophysics (Cambridge, USA). Supervisor: Prof. Abraham Loeb
Sep. 09 - Dec 09	Visiting Graduate Student at Canadian Institute for Theoretical Astrophysics (Toronto, Canada). Supervisor: Prof. Neal Dalal
Sep. 07 - Dec. 07	Research Collaborator of the CSIC, Consejo Superior de Investigaciones Cientificas, IFIC, Valencia. Supervisors: Prof. Jose Navarro-Salas & Dr. Carlos Peña-Garay
Jan. 07 - Jun. 07	Research Collaborator for the Spanish Department of Education and Science, Valencia, Spain.
Aug. 06 - Sep. 06	Summer training in Kaon experiment (Mainz, Germany). Supervisors: Dr. Salvador Sanchez & Prof. Patrick-Achenbach

Major Fields of Research

Cosmology & Astrophysics	Massive neutrinos cosmology
	21cm cosmology
	The Large Scale Structure of the Universe
	The InterGalactic Medium
	Galaxy formation and evolution
	Modified gravity

Professional activities

Referee	Monthly Notices of the Royal Astronomical Society
	Physical Review D, Physical Review Letters
	Journal of Cosmology and Astroparticle physics
	The Astrophysical Journal, Nature
	The American Astronomical Society Journal
Euclid	Member of OU-LE3 Galaxy clustering validation WP
SKA	Co-leader (with David Alonso) of the Square Kilometer Array simulations group
SMAUG	Co-leader (with Nick Battaglia) of the cosmological tests group in the Simulating Multi-scale Astrophysics to Understand Galaxies Consortium
Organizer	The non-linear Universe workshop, Smartno, Slovenia with Emanuele Castorina, Uros Seljak and Zvonimir Vlah
	Workshop on massive neutrinos, CCA, New York, USA with David Spergel
	Workshop on 21cm, CCA, New York, USA with Eli Visbal and Amanda Weltman

Student supervision

2013-2016	Elena Massara (SISSA graduate student).
2014-2016	Isabella Carucci (SISSA graduate student).
2015-present	Andrej Obuljen (SISSA graduate student).
Jun-Aug 2017	Travis Court (Allegheny college, CCA summer undergraduate student).

Computational skills

Programming	Fortran, C/C++, IDL, MPI, OpenMP, bash.
	Python: numpy, scipy, mpi4py, weave, PyCUDA, Cython
Plotting	GNUPlot, matplotlib.
Cosmological Codes	CAMB, GADGET, N-GenIC.
Fcodes	Set of python/cython libraries to analyze numerical simulations. (author)
HADES	Set of more than 1000 N-body and hydrodynamic publicly available simulations with massive/massless neutrinos. (author)

Talks

date	place		date	place
21/Jul/2017	Smartno, Slovenia		31/Aug/2015	Castiglioncello, Italy*
05/May/2017	Flic en Flac, Mauritius		07/Jul/2015	Sesto, Italy
20/Apr/2017	Brown, USA*		18/May/2015	Paralia Katerini, Greece
10/Apr/2017	Princeton, USA*		13/May/2015	Trieste, Italy
23/Mar/2017	Stony Brook, USA*		18/Feb/2015	Merate, Italy*
01/Feb/2017	Upenn, USA*		03/Feb/2015	Trieste, Italy
27/Jan/2017	CCA, NY, USA		16/Jan/2015	Oslo, Norway
11/Jan/2017	Berkeley, USA*		08/Dec/2014	Paris, France
15/Nov/2016	Johns Hopkins, USA*		10/Sep/2014	Otranto, Italy
12/Jul/2016	Sesto, Italy*		20/Aug/2014	Trieste, Italy
04/Jul/2016	Sesto, Italy*		27/Jun/2014	Arecibo, Puerto Rico, USA
22/Jun/2016	Berkeley, USA*		10/Jan/2014	Valencia, Spain
07/Jun/2016	IPMU, Tokyo, Japan		14/Oct/2013	Trieste, Italy
31/May/2016	IPMU, Tokyo, Japan*		11/Oct/2013	Trieste, Italy
24/Feb/2016	Helsinki, Finland*		24/Sep/2013	Trieste, Italy*
11/Feb/2016	Pune, India		11/Jan/2013	Trieste, Italy
21/Dec/2015	Valencia, Spain*		04/Dec/2012	Trieste, Italy
15/Dec/2015	Geneva, Switzerland*		18/Apr/2012	Trieste, Italy*
12/Nov/2015	Columbus, USA		27/Jan/2011	Valencia, Spain
10/Nov/2015	Caltech, USA		04/Feb/2010	Valencia, Spain
06/Nov/2015	Berkeley, USA		08/Apr/2009	Valencia, Spain
02/Nov/2015	Fermilab, USA		25/Sep/2006	Mainz, Germany
18/Sep/2015	Geneva, Switzerland*			

*invited

References

1) **Prof. Stefano Borgani**. Osservatorio Astronomico di Trieste, Trieste, Italy (borgani@oats.inaf.it)

2) **Prof. Neal Dalal**. University of Illinois at Urbana-Champaign, Urbana, IL, USA (dalaln@illinois.edu)

3) **Prof. Abraham Loeb**. Institute for Theory and Computation, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA (aloeb@cfa.harvard.edu)

4) **Dr. Carlos Peña-Garay**. Instituto de Fisica Corpuscular, Valencia, Spain (penya@ific.uv.es)

5) **Dr. Emiliano Sefusatti**. Osservatorio Astronomico di Trieste, Trieste, Italy (sefusatti@oats.inaf.it)

6) **Prof. David N. Spergel**. Center for Computational Astrophysics/Princeton University, New York/Princeton, USA (dspergel@flatironinstitute.org)

7) **Prof. Licia Verde**. Institute of Cosmological Sciences (ICC) UB-IEEC, Barcelona, Spain (liciaverde@icc.ub.edu)

8) **Prof. Matteo Viel**. Scuola Internazionale Superiore di Studi Avanzati (SISSA), Trieste, Italy (viel@sissa.it)

PUBLICATIONS

1. **High-redshift post-reionisation cosmology with 21cm intensity mapping**
   Andrej Obuljen, Emanuele Castorina, Francisco Villaescusa-Navarro, Matteo Viel
   September 2017, 37 pp. [e-Print Archive: astro-ph/1709.07893]
   JCAP submitted

2. **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. [e-Print Archive: astro-ph/1708.01154]
   ApJ submitted

3. **Biases from neutrino bias: to worry or not to worry?**
   Alvise Raccanelli, Licia Verde, Francisco Villaescusa-Navarro
   April 2017, 11pp. [e-Print Archive: astro-ph/1704.07837]
   MNRAS submitted

4. **The kinematic Sunyaev-Zel'dovich effect of the large-scale structure (I): dependence on neutrino mass**
   Mauro Roncarelli, Francisco Villaescusa-Navarro, Marco Baldi
   February 2017, 11 pp. [e-Print Archive: astro-ph/1702.00676]
   Published on MNRAS, 467, 985, (2017)

5. **Lensing is Low: Cosmology, Galaxy Formation, or New Physics?**
   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. [e-Print Archive: astro-ph/1611.08606]
   Published on MNRAS, 467, 3024, (2017)

6. **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. [e-Print Archive: astro-ph/1611.07527]
   Published on JCAP, 04, 001, (2017)

7. **Accurate initial conditions in mixed Dark Matter–Baryon simulations**
   Wessel Valkenburg, Francisco Villaescusa-Navarro
   October 2016, 10 pp. [e-Print Archive: astro-ph/1610.08501]
   Published on MNRAS, 467, 4401, (2017)

8. **Baryon Acoustic Oscillations reconstruction with pixels**
   Andrej Obuljen, Francisco Villaescusa-Navarro, Emanuele Castorina, Matteo Viel
   October 2016, 30 pp. [e-Print Archive: astro-ph/1610.05768]
   Published on JCAP, 09, 012, (2017)

9. **On the spatial distribution of neutral hydrogen in the Universe: bias and shot-noise of the HI Power Spectrum**
   Emanuele Castorina, Francisco Villaescusa-Navarro
   September 2016, 10 pp. [e-Print Archive: astro-ph/1609.05157]
   Published on MNRAS, 471, 1788, (2017)

10. **Baryonic acoustic oscillations from 21cm intensity mapping: the Square Kilometre Array case**
    Francisco Villaescusa-Navarro, David Alonso, Matteo Viel
    September 2016, 17 pp. [e-Print Archive: astro-ph/1609.00019]
    Published on MNRAS, 466, 2736, (2017)

11. **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. [e-Print Archive: astro-ph/1608.08057]
    MNRAS accepted

12. **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. [e-Print Archive: astro-ph/1605.05283]
Published on MNRAS, 466, 3244, (2017)

13. **Simulating cosmologies beyond ΛCDM with PINOCCHIO**
Luca A. Rizzo, Francisco Villaescusa-Navarro, Pierluigi Monaco, Emiliano Munari, Stefano Borgani, Emanuele Castorina, Emiliano Sefusatti
February 2016, 23 pp. [e-Print Archive: astro-ph/1610.07624]
Published on JCAP, 01, 008, (2017)

14. **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. [e-Print Archive: astro-ph/1510.04277]
Published on MNRAS, 456, 3553, (2016)

15. **Weighing neutrinos with cosmic neutral hydrogen**
Francisco Villaescusa-Navarro, Philip Bull, Matteo Viel
July 2015, 20 pp. [e-Print Archive: astro-ph/1507.05102]
Published on ApJ, 814, 146, (2015)

16. **Voids in massive neutrino cosmologies**
Elena Massara, Francisco Villaescusa-Navarro, Matteo Viel, Paul M. Sutter
June 2015, 31 pp. [e-Print Archive: astro-ph/1506.03088]
Published on JCAP, 11, 018, (2015)

17. **The effect of massive neutrinos on the BAO peak**
By Marco Peloso, Massimo Pietroni, Matteo Viel, Francisco Villaescusa-Navarro
May 2015, 26 pp. [e-Print Archive: astro-ph/1505.07477]
Published on JCAP, 07, 01, (2015)

18. **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. [e-Print Archive: astro-ph/1502.06961]
Published on JCAP, 07, 47, (2015)

19. **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. [e-Print Archive: astro-ph/1410.7393]
Published on JCAP, 03, 34, (2015)

20. **The halo model in a massive neutrino cosmology**
Elena Massara, Francisco Villaescusa-Navarro, Matteo Viel
October 2014, 28 pp. [e-Print Archive: astro-ph/1410.6813]
Published on JCAP, 12, 53, (2014)

21. **Semi-Analytic Galaxy Formation in Massive Neutrinos Cosmologies**
Fabio Fontanot, Francisco Villaescusa-Navarro, Davide Bianchi, Matteo Viel
September 2014, 8 pp. [e-Print Archive: astro-ph/1409.6309]
Published on MNRAS, 447, 3361, (2015)

22. **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. [e-Print Archive: astro-ph/1407.1342]
Published on JCAP, 09, 47, (2014)

23. **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. [e-Print Archive: astro-ph/1406.1191]
Published on Astronomy & Computing, 9, 1, (2015)

24. **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. [e-Print Archive: astro-ph/1405.6713]
Published on JCAP, 09, 50, (2014)

25. **Constraining Warm Dark Matter with high-z supernova lensing**
Stefania Pandolfi, Carmelo Evoli, Andrea Ferrara and Francisco Villaescusa-Navarro
Mar 2014. 7 pp. [e-Print Archive: astro-ph/1403.2185]
Published on MNRAS, 442, 13, (2014)

26. **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. [e-Print Archive: astro-ph/1311.2588]
Published on MNRAS, 440, 75, (2014)

27. **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. [e-Print Archive: astro-ph/1311.1514]
Published on JCAP, 12, 012, (2013)

28. **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. [e-Print Archive: astro-ph/1311.1212]
Published on JCAP, 02, 049, (2014)

29. **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. [e-Print Archive: astro-ph/1311.0866]
Published on JCAP, 03, 011, (2014)

30. **Non-linear evolution of the cosmic neutrino background**
Francisco Villaescusa-Navarro, Simeon Bird, Carlos Peña-Garay and Matteo Viel.
Dec 2012. 24 pp. [e-Print Archive: astro-ph/1212.4855]
Published on JCAP, 03, 019, (2013)

31. **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. [e-Print Archive: astro-ph/1106.2543]
Published on MNRAS, 431, 3670, (2013)

32. **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. [e-Print Archive: astro-ph/1104.4770]
Published on JCAP, 06, 027, (2011)

33. **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. [e-Print Archive: astro-ph/1101.1903]
Published on JCAP, 02, 030, (2011)

34. **Cores and cusps in warm dark matter halos**
Francisco Villaescusa-Navarro and Neal Dalal.
Oct 2010. 16 pp. [e-Print Archive: astro-ph/1010.3008]
Published on JCAP, 03, 024, (2011)

CONFERENCE PROCEEDINGS AND OTHERS

1. **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, Goeffry Bower, C. Matt Bradford, Patrick C. Breysse, Philip Bull, Tzu-Ching Chang, Yun-Ting Cheng, Dongwoo Chung, Kieran Cleary, Asantha Corray, Abigail Crites, Rupert Croft, Olivier Doré, Michael Eastwood, Andrea Ferrara, José Fonseca, Daniel Jacobs, Garrett K. Keating, Guilaine Lagache, Gunjan Lakhlani, Adrian Liu, Kavilan Moodley, Norm Murray, Aurélie Pénin, Gergö 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. [e-Print Archive: astro-ph/1709.09066]

2. **Beyond ΛCDM: 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. [e-Print Archive: astro-ph/1512.05356]
   Published on Physics of the Dark Universe 12 (2016) 56-99

3. **Small scales structures and neutrino masses**
   Francisco Villaescusa-Navarro
   January 2015, 4 pp. [e-Print Archive: astro-ph/1501.04546]
   Published on Nuclear and Particle Physics Proceedings, 56, 2015

4. **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. [e-Print Archive: astro-ph/1501.03989]
   Published on Proceedings of Advancing Astrophysics with the Square Kilometre Array (AASKA14)