

CURRICULUM VITAE

Personal & Contact Information

Family name : **Oñorbe Bernis**
First name : **Jose**
Nationality : Spanish
email : jonorbe@us.es
ORCID : 0000-0002-8723-1180
URL for web site : <http://www.joseonorbe.com/>

Education

2003. Graduate Studies in Physics: Theoretical Physics, at the Universidad Autónoma de Madrid (UAM, Madrid, Spain).

2005. Master in Advanced Studies on Astrophysics at the Universidad Autónoma de Madrid. Spain.

2009. Ph.D. in AstroPhysics. Diploma Title.: *Structure, Kinematics and Evolution of Elliptical Galaxies from Hydrodynamical Simulation*. Universidad Autónoma de Madrid. Spain. Supervisor: Prof. R. Domínguez-Tenreiro.

Current Position

2019 – present. Beatriz Galindo Research Fellow, Physics Department, University of Seville, Spain.

2018 – present. Affiliate, Computational Cosmology Center. Lawrence Berkeley National Laboratory, United States.

Past Positions

2005 – 2009. Ph.D. student Universidad Autónoma de Madrid, Spain.

2009 – 2010. Postdoctoral Fellow at the Universidad Autónoma de Madrid, Spain.

2010 – 2013. Fulbright Postdoctoral Fellow, University of California, Irvine, United States.

2013 – 2017. Postdoctoral Fellow, Max Planck Institute for Astronomy, Heidelberg, Germany

2017 – 2019. Research Associate, Institute for Astronomy, University of Edinburgh, United Kingdom.

2019 – 2019. "Atracción de Talento" Senior Research Fellow, Astronomy Department, Universidad Complutense de Madrid, Spain.

Fellowships/Awards

2005 – 2009. Ph.D. Research Fellowship: Formación de Personal Investigador, from Spanish Ministry of Education and Science.

2010 – 2012. Fulbright Postdoctoral Fellowship.

2013. University of California-HiPACC's Small Grants Program

2019. "Atraccion de Talento" Senior Research Fellowship from Madrid regional Government.

2019. Beatriz Galindo Senior Research Fellowship from Spanish Ministry of Science.

Computational Projects

- Large experience in competitive regime applications for computational time projects in High Performance Computing facilities and its use: XSEDE, NAS, PRACE, NERSC, MPCDF (RZG), RES.

- 2018-2019: PI of the project MENHIRS that was awarded with 18 million hours in the 16th Call for PRACE (European Supercomputing Network) Project Access. PI of the project "Impact of Reionization of the Intergalactic Medium" that has been awarded with 1.25 million hours in 10th Call for DiRAC (UK Supercomputing Network) Project Access.

- 2020: co-I of the project "Decoding the physics of the Intergalactic Medium" that has been awarded the INCITE allocation on Summit supercomputer with 500.000 node hours.

Teaching and Outreach Experience

2004. Master for High School Teaching at the Universidad Complutense de Madrid. Practice at I.E. Cervantes High School (Madrid).

2009 - 2010. Lecture on Computational Astrophysics in the POPIA Master and PhD Degree Program of Universidad Autonoma de Madrid and Universidad Complutense de Madrid Universities.

- *Why do we say that the space is cold?*, J. Oñorbe. Chapter in the outreach book: "Science, and I also understand it!". Publication scheduled for November 2016.

<http://divulgacioncientificadecientificos.blogspot.de/p/capitulos-c.html>.

- *arc2parc* online calculator. An online calculator to convert between angular size and linear size. <http://arcsec2parsec.joseonorbe.com/>.

- *September 2017. Galaxies Inside Computers*, Outreach talk during Open Days of the Royal Observatory of Edinburgh.

- *Meet the Astronomer*, short Q&A sessions with primary age groups at the Royal Observatory of Edinburgh.

- *September 2019 - November 2019*. Lecture on Stellar Atmospheres in the Astrophysics Master of the Universidad Complutense de Madrid.

- *December 2019. Physics Nobel Prize 2019*, Outreach talk on the 2019 Physics Nobel Prize done at the University of Seville.

- *2019 - present*. Lecture on Astrophysics and Quantum Physics Laboratory in the Physics Degree Program at the University of Seville.

Mentoring Summary

2010-2013. At the University of Irvine I co-supervised with Prof. J. Bullock the following PhD students: S. Garrison-Kimmel, C. Schultz, O. Elbert and C. Wheeler. The Schultz et al. (2014), Wheeler et al. (2015) projects, published in peer-review journals, have been fully supervised by me.

2013-2017. At the Max Planck Institute for Astronomy, I have also been heavily involved co-supervising or fully supervising several Master and PhD students in the

ENIGMA group lead by J. Hennawi. I fully supervised D. Sorini (PhD) and A. Singh (Master) and co-supervised M. Walther (PhD), H. Hiss (PhD), T. Heilker (Master) and C. Rodriguez (Master). The Sorini et al. (2016, 2017) are published projects which I fully supervised.

2017-2019. At the the University of Edinburgh, I have also been tutoring Summer project students, Master and PhD students. In particular I have fully supervised the summer project of T, Solsntinsky (2018) and the Master project of J. Vyse (2018/2019). I co-supervised Master projects of J. Cruz Guerra (2017/2018; with C. Della-Vecchia) and A. Mobberley (2018/2019; with S. Khochfar). I also co-supervised three PhD students, together with S. Khochfar: B. Morton, A. Incatasciato and M. Kalomenopoulos.

2020-present Since my arrival to the University of Sevilla I have been tutoring several last year research projects of Physics Degree students. In particular: J. Pimentel (2020), I. Bejarano (2020).

Organisation of International Conferences

- Durham-Edinburgh eXtragalactic Workshop, Edinburgh, 7-8 January 2018 (chair).
- Durham-Edinburgh eXtragalactic Workshop, Durham, 8-9 January 2018.
- From Wall to Web. Berlin, Germany, 24-29 July 2016.
- MPA-MPIA Joint Workshop. Heidelberg, Germany, 23-27 June 2014.
- Intergalactic Matters. Heidelberg, Germany 16-20 June 2014.
- H-Metal Workshop. El Escorial, Madrid, Spain, 16-18 October 2010.

Professional Memberships, Service

-*2017 - present* Member of the Astronomy, Space and Earth Sciences panel of the Spanish Supercomputing Network (RES). Evaluations every 3 months.

- Reviewer of proposals for the SuperMuc Petascale System (Leibniz Supercomputing Centre, Germany) and ISCRA (Italian SuperComputing Resource Allocation).

- Referee for Astrophysical Journal, Astrophysical Journal Letters, Monthly Notices of the Royal Astronomy Society.

- SEA (Spanish Astronomy Association).

PUBLICATION LIST

Publications in Refereed Journals

As in May 2020, I have 39 refereed publications and 3546 citations. First author paper (bold numbers): 9. First author citations: 389. Second author papers: 7. Current h-index: 25.

1. Clues on the Physical Origin of the Fundamental Plane from Self-Consistent Hydrodynamical Simulations. **J. Oñorbe**, R. Domínguez-Tenreiro, A. Sáiz, A. Serna and H. Artal. 2005, The Astrophysical Journal, Volume 632, Issue 2, pp. L57-L60. [astro-ph/0511533](#).
2. The Lack of Structural and Dynamical Evolution of Elliptical Galaxies since $z \sim 1.5$: Clues from Self-Consistent Hydrodynamical Simulations. R. Domínguez-Tenreiro, **J. Oñorbe**, A. Sáiz, H. Artal and A. Serna. 2006, The Astrophysical Journal, Volume 636, Issue 2, pp. L77-L80. [astro-ph/0511556](#).
3. Clues on the Regularity in the Structure and Kinematics of Elliptical Galaxies from Self-Consistent Hydrodynamical Simulations. **J. Oñorbe**, R. Domínguez-Tenreiro, A. Sáiz and A. Serna. 2006, Monthly Notices of the Royal Astronomy Society, Volume 373, pp. 503-520. [astro-ph/0609499](#).
4. Bright and Dark Matter in Elliptical Galaxies: Mass and Velocity Distributions from Self-consistent Hydrodynamical Simulations. **J. Oñorbe**, R. Domínguez-Tenreiro, A. Sáiz, A. Serna and H. Artal. 2007, Monthly Notices of the Royal Astronomy Society, Volume 376, pp. 39-60. [astro-ph/0612732](#).
5. Shape and kinematics of elliptical galaxies: evolution due to merging at $z < 1.5$. A.C. González-García, **J. Oñorbe**, R. Domínguez-Tenreiro and M.A. Gómez-Flechoso. 2009, Astronomy & Astrophysics, Volume 497, Issue 1, pp.35-40. [astro-ph/0812.4306](#).
6. Large-Scale Gas Dynamics in the Adhesion Model: Implications for the Two-Phase Massive Galaxy Formation Scenario. R. Domínguez-Tenreiro, **J. Oñorbe**, F. Martínez-Serrano and A. Serna. 2011, Monthly Notices of the Royal Astronomy Society, Volume 413, pp. 3022-3038. [astro-ph/1010.6294](#).
7. Massive Galaxies at High- z : Assembly Patterns, Structure & Dynamics in the Fast Phase of Galaxy Formation. **J. Oñorbe**, F. Martínez-Serrano, R. Domínguez-Tenreiro, A. Knebe and A. Serna. 2011, The Astrophysical Journal, Volume 732, Issue 2, pp. L32. [astro-ph/1103.4214](#).
8. Cosmological Simulations with Self-Interacting Dark Matter I: Constant Density Cores and Substructure. M. Rocha, A.H. Peter, J.S. Bullock, M. Kaplinghat, S. Garrison-Kimmel, **J. Oñorbe** and L.A. Moustakas. 2013, Monthly Notices of the Royal Astronomy Society, Volume 430, pp. 81. [astro-ph/1208.3025](#).
9. The AGORA High-resolution Galaxy Simulations Comparison Project. J. Kim, and the AGORA collaboration. 2014, The Astrophysical Journal Supplement, Volume 210, Issue 1, 20 pp. [astro-ph/1308.2669](#).
10. How to zoom: Lagrange volume and the multimass technique. **J. Oñorbe**, A. Maller, J.S. Bullock, S. Garrison-Kimmel and O. Hahn. 2014, Monthly Notices of the Royal Astronomy Society, Volume 437, pp. 1894. [astro-ph/1208.3025](#).
11. Sterile neutrino dark matter bounds from galaxies of the Local Group. S. Horiuchi, P. Humphrey, **J. Oñorbe**, K. Abazajian, M. Kaplinghat, S. Garrison-Kimmel. 2014, Phys. Rev. D., Volume 89, 025017. [astrp-ph/1311.0282](#).
12. The high- z universe confronts warm dark matter: Galaxy counts, reionization and the nature of dark matter. C. Schultz, **J. Oñorbe**, K. Abazajian, J. Bullock. 2014, Monthly Notices of the Royal Astronomy Society, Volume 442, pp. 1597. [astro-ph/1401.3769](#).
13. Galaxies on FIRE (Feedback In Realistic Environments): stellar feedback explains cosmologically inefficient star formation. P. Hopkins, D. Keres, **J. Oñorbe**, C.A. Faucher-Giguère, E. Quataert, N. Murray, J. Bullock. 2014, Monthly Notices of the Royal Astronomy Society, Volume 445, pp. 581. [astro-ph/1311.2073](#)

14. Core Formation in Dwarf Halos with Self Interacting Dark Matter: No Fine-Tuning Necessary.
O. Elbert, J. Bullock, S. Garrison-Kimmel, M. Rocha, **J. Oñorbe**, A. Peter. 2014, Monthly Notices of the Royal Astronomy Society, Volume 453, pp. 29. [astro-ph/1412.1477](#).
15. Lagrangian Volume Deformations around Simulated Galaxies.
S. Robles, R. Domínguez-Tenreiro, **J. Oñorbe**, F. Martínez-Serrano. 2015, Monthly Notices of the Royal Astronomy Society, Volume 451, pp. 486. [astro-ph/1504.06297](#).
16. Forged in FIRE: cusps, cores, and baryons in low-mass dwarf galaxies.
J. Oñorbe, M. Boylan-Kolchin, J. Bullock, P. Hopkins, D. Keres, C.A. Faucher-Giguère, E. Quataert, N. Murray. 2015, Monthly Notices of the Royal Astronomy Society, accepted. [astro-ph/1502.02036](#).
17. Sweating the small stuff: simulating dwarf galaxies, ultra-faint dwarf galaxies, and their own tiny satellites.
C. Wheeler, **J. Oñorbe**, J.S. Bullock, M. Boylan-Kolchin, O.D. Elbert, S. Garrison-Kimmel, P.F. Hopkins, D. Keres. 2015, Monthly Notices of the Royal Astronomy Society, Volume 453, p.1305. [astro-ph/1504.02466](#).
18. Characterizing the Jeans Filtering Scale of the Intergalactic Medium.
G. Kulkarni, J. F. Hennawi, **J. Oñorbe**, A. Rorai, V. Springel. 2015, Monthly Notices of the Royal Astronomy Society, accepted. [astro-ph/1504.00366](#).
19. Effects of Coupled Dark Energy on the Milky Way and its Satellites.
C. Penzo, A. V. Macciò, M. Baldi, L. Casarini, **J. Oñorbe**. 2015, Monthly Notices of the Royal Astronomy Society, 461, 2490. [astro-ph/1504.07243](#).
20. The Impact of Baryonic Physics on the Structure of Dark Matter Halos: the View from the FIRE Cosmological Simulations.
T. K. Chan, D. Keres, **J. Oñorbe**, P. F. Hopkins, A. L. Muratov, C. A. Faucher-Giguère, E. Quataert. 2015, Monthly Notices of the Royal Astronomy Society, 454, 2981. [astro-ph/1507.02282](#).
21. Properties of resonantly produced sterile neutrino dark matter subhaloes.
S. Horiuchi, B. Bozek, K. Abazajian, M. Boylan-Kolchin, J.S. Bullock, S. Garrison-Kimmel, **J. Oñorbe**. 2016, Monthly Notices of the Royal Astronomy Society, Volume 456, p. 4346. [astro-ph/1512.04548](#).
22. Modeling the Lyman- α Forest in Collisionless Simulations.
D. Sorini, **J. Oñorbe**, J. F. Hennawi. 2016, The Astrophysical Journal, Volume 827, Issue 2, 23 pp. [astro-ph/1602.08099](#).
23. High Angular Momentum Halo Gas: a Feedback and Code-Independent Prediction of LCDM.
K. Stewart, A. Maller, **J. Oñorbe**, J. Bullock, M.R. Joung, J. Devriendt, D. Ceverino, D. Keres; P.F. Hopkins, C.A. Faucher-Giguère. 2016, The Astrophysical Journal, 843, 47. [astro-ph/1606.08542](#)
24. FIRE in the Field: Simulating the Threshold of Galaxy Formation.
A. Fitts, B. K. Boylan-Kolchin, O. Elbert, J. Bullock, P. Hopkins, **J. Oñorbe**, et al. 2017, Monthly Notices of the Royal Astronomy Society, 471, 3547 [astro-ph/1611.02281](#).
25. Self-Consistent Modeling of Reionization in Cosmological Hydrodynamical Simulations.
J. Oñorbe, J.F. Hennawi, Z. Lukić. 2017, The Astrophysical Journal, Volume 837, Issue 1060, 23 pp [astro-ph/1607.04218](#).
26. The no-spin zone: rotation vs dispersion support in observed and simulated dwarf galaxies.
C. Wheeler, A. Pace, J.S. Bullock, M. Boylan-Kolchin, **J. Oñorbe**, A. Fitts, P.F. Hopkins, D. Keres. 2017, Monthly Notices of the Royal Astronomy Society, Volume 465, p. 2420. [astro-ph/1511.01095](#).
27. Measurement of the small-scale structure of the intergalactic medium using close quasar pairs
A. Rorai, J.F. Hennawi, **J. Oñorbe**, M. White, J.X. Prochaska, G. Kulkarni, M. Walther, K.G. Lee, Z. Lukić. 2017, Science, 356, 418. [astro-ph/1607.04218](#).
28. Constraining Reionization with the $z \sim 5 - 6$ Lyman- α Forest Power Spectrum: the Outlook after Planck.
J. Oñorbe, J.F. Hennawi, Z. Lukić, M. Walther 2017, The Astrophysical Journal, 847, 63. [astro-ph/1703.08633](#).
29. A New Precision Measurement of the Small-Scale Line-of-Sight Power Spectrum of the Ly- α Forest.
M. Walther, J.F. Hennawi, H. Hiss, **J. Oñorbe** et al. 2018, The Astrophysical Journal, 852, 22. [astro-ph/1709.07354](#).

30. A Fundamental Test for Galaxy Formation Models: Matching the Lyman- α Absorption Profiles of Galactic Halos over Three Decades in Distance.
D. Sorini, **J. Oñorbe**, J.F. Hennawi, Z. Lukić
2017, The Astrophysical Journal, 859, 125. [astro-ph/1709.03988](#).
31. A New Measurement of the Temperature Density Relation of the IGM From Voigt Profile Fitting.
H. Hiss, M. Walther, J.F. Hennawi, **J. Oñorbe**, J. O'Meara, A. Rorai 2018, The Astrophysical Journal, 865, 42. [astro-ph/1710.00700](#).
32. Modeling the HeII Transverse Proximity Effect: Constraints on Quasar Lifetime and Obscuration.
T. Schmidt, J.F. Hennawi, G. Worseck, F. Davies, Z. Lukić, **J. Oñorbe** 2018, The Astrophysical Journal, 861, 122. [astro-ph/1710.04527](#).
33. Mapping quasar light echoes in 3D with Ly α forest tomography
T. Schmidt, J.F. Hennawi, K.G. Lee, Z. Lukić, **J. Oñorbe**, M. White
2018, The Astrophysical Journal, 882, 165. [astro-ph/1810.05156](#).
34. New Constraints on IGM Thermal Evolution from the Lyman- α Forest Power Spectrum.
M. Walther, **J. Oñorbe**, J.F. Hennawi, Z. Lukić.
2019, The Astrophysical Journal, 872, 13. [astro-ph/1808.04367](#).
35. The Power Spectrum of the Lyman- α Forest at $z < 0.5$.
V. Khaire, M. Walther, J. F. Hennawi, **J. Oñorbe**, Z. Lukić, J. X. Prochaska, T. M. Tripp, J. N. Burchett, C. Rodriguez.
2019, The Astrophysical Journal, 486, 769. [astro-ph/1808.05605](#).
36. QSO MUSEUM I: A sample of 61 extended Ly α -emission nebulae surrounding $z \sim 3$ quasars.
F. Arrigoni Battaia, J.F. Hennawi, J. X. Prochaska, **J. Oñorbe**, E. P. Farina, S. Cantalupo, E. Lusso.
2019, MNRAS, 482, 3. [astro-ph/1808.10857](#).
37. Inhomogeneous Reionization Models in Cosmological Hydrodynamical Simulations.
J. Oñorbe, F. Davies, Z. Lukić, J.F. Hennawi, D. Sorini.
2019, Monthly Notices of the Royal Astronomy Society, 486, 4075. [astro-ph/1810.05156](#).
38. A Novel Statistical Method for Measuring the Temperature-Density Relation in the IGM Using the b-NHI Distribution of Absorbers in the Ly α Forest.
H. Hiss, M. Walther, **J. Oñorbe**, J.F. Hennawi.
2019, The Astrophysical Journal, submitted. [astro-ph/1903.11940](#).
39. Anomaly in the Opacity of the Post-reionization Intergalactic Medium in the Ly α and Ly β Forest.
A.C. Eilers, J.F. Hennawi, F.B. Davies, **J. Oñorbe**
2019, The Astrophysical Journal, 881, 23. [astro-ph/1906.05874](#).

Selected International Conference and Seminar Talks

(just oral contributions during the last 5 year)

- *CATARSIS: high-z observations and synergies.*
Public Surveys and new instrumentation for Calar Alto Observatory, Calar Alto Observatory, virtual workshop, March 2020.
- *What do we know about HI Reionization? New Constraints from the high-z Lyman- α Forest.*
UCL Astronomy Seminar, UCL, London, United Kingdom, October 2018.
- *New Reionization Constraints from the high-z Lyman- α Forest.*
Spanish Astronomical Society Meeting, Salamanca, Spain, July 2018.
- *New Reionization Constraints from the high-z Lyman- α Forest.*
Intergalactic Interconnections, Marseille, France, June 2018.
- *New Reionization Constraints from the high-z Lyman- α Forest.*
Rise and Shine: galaxies in the epoch of reionization, Strasbourg, France, June 2018.
- *What do we know about HI Reionization? New Constraints from the high-z Lyman- α Forest.*
IPMU APEC Seminar, IPMU, Tokyo, Japan, May 2018.

- *What do we know about HI Reionization? New Constraints from the high-z Lyman- α Forest.*
Colloquium Seminar, Geneva Observatory, Switzerland, April 2018.
- *Reionization Constraints from the high-z Lyman- α Forest.*
New frontiers in galaxy-evolution modelling, London, United Kingdom, October 2017.
- *What do we know about HI Reionization? New Constraints from the high-z Lyman- α Forest.*
Königstuhl Colloquium, Heidelberg, Germany, August 2017.
- *UV Background Models in Hydrodynamical Simulations.*
The Dawn of Galaxies, Obergulg, Austria, January 2017.
- *Modeling gas flows in galaxies* (invited review talk).
Annual Meeting German Astrophysical Society, Bochum, Germany, September 2016.
- *Direct Constraints of HI Cosmic Reionization from Lyman- α observations at $z\sim 5-6$.*
From Wall to Web, Berlin, Germany, July 2016.
- *New Models of the UV-Background in Cosmological Hydrodynamical Simulations.*
High-z, Malta, July 2016.
- *Galaxies on FIRE (Feedback in Realistic Environments): The Role of Stellar Feedback in Dwarf Galaxy Formation.*
Dark Matter 2016, Santander, Spain, June 2016.
- *New Models of the UV-Background in Cosmological Hydrodynamical Simulations: Implications for IGM and galaxy formation observations.*
Dark Ages 2016, Heidelberg, Germany, June 2016.
- *Direct Constraints of HI Cosmic Reionization from Lyman- α observations at $z\sim 5-6$.*
Cosmology 2016, Barcelona, June 2016.
- *Future simulations and astronomical data* (invited review talk).
Dark Matter in the Milky Way, Mainz, Germany, May 2016.
- *Building Consistent UVB Models in Hydrodynamical Simulations.*
IMPS Winter Retreat, Esalen, California, USA, February 2016.