

# LUCA VISINELLI

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## Previous research experience

- 2020 – 2021 **Marie Curie “Fellini” fellow**, INFN Frascati National Laboratories (Italy)
- 2019 – 2020 **GRAPPA fellow**, GRAPPA, University of Amsterdam (Netherlands)  
*Principal investigator*: Prof. Christopher Weniger (GRAPPA, Amsterdam)
- 2016 – 2019 **Postdoctoral researcher**, NORDITA, Stockholm (Sweden)  
*Principal investigator*: Prof. Katherine Freese (UT Austin & Stockholm U.)
- 2013 – 2015 **Postdoctoral fellow**, Mediterranean Center on Climate Changes (CMCC), Bologna (Italy)  
*Principal investigators*: Prof. Simona Masina (CMCC)
- 2007 – 2011 **Research assistant**, The University of Utah (USA)

## Education

- December 16, 2011 **Ph.D. in Physics**, The University of Utah, Salt Lake City, USA.  
Advisor: Prof. Paolo Gondolo. Thesis: *Axions in CDM and inflation models*
- August 5, 2011 **M.Sc. in Physics**, The University of Utah, Salt Lake City, USA.  
Advisor: Prof. Paolo Gondolo. GPA: 3.982/4.000
- June 22, 2007 **M.Sc. in Physics**, University of Bologna, Italy.  
Advisor: Prof. Fiorenzo Bastianelli. Grade: 110/110 *cum Laude*
- October 14, 2005 **B.Sc. in Physics**, University of Bologna, Italy.  
Advisor: Prof. Giovanni Carlo Bonsignori. Grade: 110/110 *cum Laude*
- July 4, 2002 **High School Diploma**, High School “E. Fermi”, Bologna, Italy. Grade: 100/100.

## Certifications

- 2020-2029 **National Scientific Qualification** for the role of Associate Professor in Italy.  
Sector of competence: “02/A2 - Theoretical Physics of Fundamental Interactions”

## Publications

Full list of publications provided below, see also my [INSPIRE](#), [ADS](#), and [Google Scholar](#); **h-index=36**; 70 papers (60 published/accepted on top-tier JCR journals); 5000+ total citations, 13 (23) papers with 100+ (50+) citations; 82.9 average citations per refereed paper (INSPIRE statistics as of March 17, 2023)

- ORCID** [0000-0001-7958-8940](https://orcid.org/0000-0001-7958-8940)
- ResearcherID** [J-5573-2015](https://www.researcherid.org/profile/J-5573-2015)
- Scopus** [34168444500](https://www.scopus.com/authid/detail.uri?authorid=34168444500)
- ArXiv** [My article list on https://arxiv.org](https://arxiv.org)
- Sciprofiles** <https://sciprofiles.com/profile/lucavisinelli>
- GIT Repository** <https://github.com/lucavisinelli>

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## Participation in Research and Development Contracts

- 2020-2021 Horizon 2020 research and innovation programme, issued by the European Union under the Marie Skłodowska-Curie grant agreement No. 754496 (H2020-MSCA-COFUND-2016 FELLINI) “Tools for Axions, Leptogenesis, and Neutrino Theories”.  
Principal Investigator: **Luca Visinelli**. 2020-2023. 50.520,00 EUR/year.
- 2019-2020 Dutch Research Council, contract No. 680.92.18.03 “The Hidden Universe of Weakly Interacting Particles”, Principal Investigator: Prof. Paul De Jong (University of Amsterdam), 2018-2023. I took part as GRAPPA Fellow at University of Amsterdam.
- 2016-2019 Swedish Research Council, contract No. 638-2013-8993, Principal Investigator Prof. Katherine Freese (U. of Texas Austin and Stockholm University), 2014-2024. Approximately 10.000.000,00 EUR. I took part at Stockholm University and Uppsala University.
- 2015 EU FP7-SPACE “MyOcean followup”, Principal Investigator Prof. Simona Masina (Research division director, Euro-Mediterranean Centre on Climate Changes), 2014-2015. 99.244,19 EUR. I participated as a post-doctoral researcher at CMCC.
- 2013-2014 EU FP7-SPACE “MyOcean2”, Principal Investigator Prof. Simona Masina (Research division director, Euro-Mediterranean Centre on Climate Changes), 2012-2014. 464.980,00 EUR. I participated as a post-doctoral researcher at CMCC.
- 2013-2014 EU FP7-ENV “GEOCARBON”, Principal Investigator Prof. Simona Masina (Research division director, Euro-Mediterranean Centre on Climate Changes), 2012-2014. 95.000,00 EUR. I participated as a post-doctoral researcher at CMCC.

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## Individual Grants, Fellowships, and Prizes Awarded

- January 2022 [2021 Buchalter Cosmology Prize \(Third Prize\)](#) for the paper “Direct detection of dark energy: the XENON1T excess and future prospects” [[hep-ph/2103.15834](#)].  
Co-recipients: S. Vagnozzi, P. Brax, A.C. Davis, J. Sakstein.  
Also announced by the [American Astronomical Society](#).
- December 2021 **High-level overseas talent**, Shanghai municipality.
- November 2020 **Tenure-track position** offered as Associate Professor, Shanghai Jiao Tong University, with joint Fellowship at the [Tsung-Dao Lee Institute](#). Startup fund: approx. 210 k USD.
- November 2020 [Fellini Fellowship under Marie Skłodowska-Curie COFUND Action](#), 2020-2023.  
Project: “Tools for Axions, Leptogenesis and Neutrino Theories (TALeNT)”.  
Approximately 52.000 EUR/year, to be spent at INFN Frascati.
- 2007-2008 [Award for PhD students abroad](#) (26.318,70 EUR), University of Bologna
- Fall 2006 Undergraduate Student Award (approx. 2.000 EUR), University of Bologna

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## Group Grants and Fellowships Awarded

- November 2022 [Green Bank Telescope Proposal: “Continuing the Search for Axion Dark Matter in Andromeda with VEGAS”](#), Accepted (GBT/23A-245). Data to be taken in 2023.
- Spring 2022 [COST Action Proposal OC-2019-1-23688 “COSMIC WISPerS in the Dark Universe: Theory, astrophysics and experiments”](#), Approved. Principal investigator: Prof. Alessandro Mirizzi.
- August 2021 [Green Bank Telescope Proposal: “Searching for Axion Dark Matter in Andromeda Using an X-band Receiver”](#), Accepted (GBT/22A-067). Data have been taken during 2022.

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## Other Awards

- Fall 2019 [Tax Relief Award “Rientro dei Cervelli” \(Brain Gain\) issued by the Italian Government](#)
- Fall 2019 [Tax Relief Award for highly skilled immigrants in the Netherlands](#)
- Fall 2016 [Tax Relief Award for foreign key personnel in Sweden](#)
- Spring 2011 Outstanding Teaching Assistantship Award, The University of Utah.
- 2001-2002 Honorable Mention at the Italian Physics Olympiads.

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## Service in Editorial Boards

- 2022-2023 Guest editor for the Special Issue of the journal Symmetry: “*Asymmetric and Symmetric Dark Matter*”, to be published in 2023.  
Link: [https://www.mdpi.com/journal/symmetry/special\\_issues](https://www.mdpi.com/journal/symmetry/special_issues).
- 2020-2022 Guest editor for the Special Issue of the journal Universe: “*Dark Matter and Dark Energy: Particle Physics, Cosmology, & Experimental Searches*”, to appear in 2023.  
Link: [www.mdpi.com/journal/universe/special\\_issues/DM\\_DE](http://www.mdpi.com/journal/universe/special_issues/DM_DE).

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## Teaching Experience

- 2017 Lecturer for FK5024 “Nuclear physics”, Stockholm University, Stockholm (Sweden)
- 2015-2016 Lecturer for “Introductory Mathematics”, Department of Political Sciences, University of Bologna (Italy)
- 2015 Teaching assistant in Mathematics for International Markets, Department of Economics, University of Bologna. Supervisor: Prof. Sabrina Mulinacci
- 2015 Teaching assistant for “Mathematics for Economics and Finance”, Department of Economics, University of Bologna. Supervisor: Prof. Alessandra Giovagnoli
- 2010-2011 Teaching assistant for Physics 3740, “Special relativity and quantum mechanics”, The University of Utah. Supervisors: Prof. Kyle Dawson and Prof. Jordan Gerton
- 2009 Teaching assistant for Physics 5020, “Electromagnetism”, The University of Utah. Supervisor: Prof. Mikhail Raikh
- 2008 Teaching assistant for Physics 5010, “Classical and Quantum Mechanics”, The University of Utah. Supervisor: Prof. Mikhail Raikh

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## Supervision and Mentoring

- 2022–today I am **supervising** M.Sc. student Kratika Mazde (Indian Institute of Science Education and Research); [kratikamazde18@iisertvm.ac.in](mailto:kratikamazde18@iisertvm.ac.in). Topics: Cosmology and astroparticles.
- 2019–2020 I **supervised** M.Sc. student Nicklas Ramberg (Uppsala University, now at Mainz University); [nramberg@uni-mainz.de](mailto:nramberg@uni-mainz.de). [\[LINK TO THE MASTER THESIS\]](#)
- 2021–today I am mentoring M.Sc. student Rittick Roy (Fudan University); [rittickrr@gmail.com](mailto:rittickrr@gmail.com). Topics: Black hole superradiance.
- 2019–2022 I have mentored Ph.D. student Youjia Wu (University of Michigan); [youjiawu@umich.edu](mailto:youjiawu@umich.edu). Advisor: Katherine Freese. Topics: Dark matter physics and stellar formation.
- 2017 I have mentored Ph.D. student Janina Renk (Stockholm University). Advisors: Katherine Freese, Joakim Edsjö. Topics: stellar evolution with [MESA](#).

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## Research in Physics

**Topics** Theoretical physics, astroparticle physics, and cosmology.

**Sample talk:** my presentation in Georgetown University (Washington D.C.) for the Vera Rubin Symposium, link: <https://www.youtube.com/watch?v=iazE3tBg2cw>

**Interests** Phenomenology of the physics beyond the Standard Model of particle physics

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## Academic Service

2017-2018 Nordita Postdoc Representative (Administrative position), Stockholm (Sweden).

2017-2018 Organising the bi-weekly “Beyond the Standard Model” Workgroup at Oskar Klein Centre, Stockholm (Sweden).

2016-Today Regular refereeing for Physical Review Letters (PRL), Physical Review D (PRD), Physics Letters B (PLB), Journal of Cosmology & Astroparticle Physics (JCAP), Modern Physics Letters A (MPLA), Universe.

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## Programming skills

Systems Linux, UNIX, Mac OS, Microsoft.

Programming Python, Fortran, C/C++, Visual Basic, Pascal, parallel computing with MPI.

Calculus Mathematica, Matlab, R.

Databases Maintenance of numerical codes using the GIT repository

Datasets Manipulating large datasets in different format: NetCDF, ASCII, NCO, CDO.

Supercomputer High performance computing (IBM iDataplex cluster “Athena”, 7712 cores).

Text editor Microsoft Office,  $\LaTeX$ , Vi.

Software used GALPROP, DarkSUSY, Gadget2, MESA, NEMO, BFM.

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## Languages

English Writing, Speaking, Listening. 2007- TOEFL English Certification.  
2002 - University of Cambridge FCE, Bologna.

Italian Mother tongue

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## Press coverage and media appearance

October 2021 “[Signal From The XENON1T Experiment May Be A Hallmark Of Dark Energy](#)”, **Forbes**

September 2021 “[Have we detected dark energy?](#)”, **[www.cam.ac.uk](http://www.cam.ac.uk)**

June 2021 “[Can we see dark energy from Earth? New experiments offer hope](#)”, **Space.com**

January 2021 “[Black holes could reach 'stupendously large' sizes](#)”, **Queen Mary University of London**

November 2020 “[Top ArXiv papers from week 48 2020, entry #2](#)”, **Sunny Vagnozzi's blog**

November 2020 “[Top ArXiv papers from week 46 2020, entry #2](#)”, **Sunny Vagnozzi's blog**

September 2020 “[‘Stupendously large’ black holes could grow to truly monstrous sizes](#)”, **Space.com**

September 2020 “[Black holes - Do they grow stupendously large?](#)”, **Astrobit.es.org**

April 2020 “[Interview with Luca Visinelli on “Il Messaggero” \(In Italian\)](#)”, **ilmessaggero.it**

September 2018 “[Hunting for extra dimensions with gravitational waves](#)”, **Oskar Klein Centre blog**

August 2018 “[Zoos, Swamplands and Cosmology](#)”, **Astrobit.es.org**

September 2017 “[Interview with Luca Visinelli](#)”, **Oskar Klein Centre blog**

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## Articles published in peer-reviewed international journals

A complete list of my publications can be found at: <http://inspirehep.net/author/profile/L.Visinelli.1>

60. G. Montefalcone, V. Aragam, **L. Visinelli**, and K. Freese, *Observational constraints on warm natural inflation*, *JCAP* **2303**, 002 [[gr-qc/2212.04482](#)] (2023).
59. A. Litsa, K. Freese, E. Sfakianakis, P. Stengel, and **L. Visinelli**, *Primordial non-Gaussianity from the Effects of the Standard Model Higgs during Reheating after Inflation*, *JCAP* **2303**, 033 [[hep-ph/2011.11649](#)] (2023).
58. Y.-D. Tsai, Y. Wu, S. Vagnozzi, and **L. Visinelli**, *Asteroid astrometry as a fifth-force and ultralight dark sector probe*, Accepted on *JCAP* [[hep-ph/2107.04038](#)] (2022).
57. K. Mazde and **L. Visinelli**, *The interplay between the dark matter axion and primordial black holes*, *JCAP* **2301**, 021 [[astro-ph/2209.14307](#)] (2023).
56. G. Lambiase, L. Mastrototaro, and **L. Visinelli**, *Chern-Simons axion gravity and neutrino oscillations*, *JCAP* **2301**, 011 [[hep-ph/2207.08067](#)] (2023).
55. L. Caloni, M. Gerbino, M. Lattanzi, and **L. Visinelli**, *Novel cosmological bounds on thermally-produced axion-like particles*, *JCAP* **2209**, 021 [[astro-ph/2205.01637](#)] (2022).
54. W. Lin, **L. Visinelli**, D. Xu, and T. T. Yanagida, *Neutrino astronomy as a probe of physics beyond the Standard Model*, *Phys. Rev. D* **106**, 075011 [[hep-ph/2202.04496](#)] (2022).
53. Y. Wu, S. Baum, K. Freese, **L. Visinelli**, and H.-B. Yu, *Dark stars powered by self-interacting dark matter*, *Phys. Rev. D* **106**, 043028 [[hep-ph/2205.10904](#)] (2022).
52. Y. Chen, R. Roy, S. Vagnozzi, and **L. Visinelli**, *Superradiant evolution of the shadow and photon ring of Sagittarius A\**, *Phys. Rev. D* **106**, 043021 [[astro-ph/2205.06238](#)] (2022).
51. S. Vagnozzi and **L. Visinelli**, *Note on fundamental physics tests from black hole imaging*, *Res. Notes AAS* **6**, 106 [[astro-ph/2205.11314](#)] (2022).
50. **L. Visinelli** and H. Terças, *B-field induced mixing between Langmuir waves and axions*, *Phys. Rev. D* **105**, 096024 [[hep-ph/1807.06828](#)] (2022).
49. E. di Valentino *et al*, *A Review of the Particle Physics, Astrophysics, and Cosmology Associated with the Cosmological Tensions and Anomalies*, *J. High En. Astrophys.* **2204**, 002 [[astro-ph/2203.06142](#)] (2022).
48. R. Roy, S. Vagnozzi, and **L. Visinelli**, *Superradiance evolution of black hole shadows revisited*, *Phys. Rev. D* **105**, 083002 [[astro-ph/2112.06932](#)] (2022).
47. B. Barman, N. Bernal, N. Ramberg, and **L. Visinelli**, *QCD Axion Kinetic Misalignment without Prejudice*, *Universe* **8**(12), 634 [[hep-ph/2111.03677](#)] (2022).
46. **L. Visinelli**, *Boson Stars and Oscillatons: A Review*, *Int. J. Mod. Phys. D* **30** 15, 2130006 [[gr-qc/2109.05481](#)] (2021).
45. G. Choi, W. Lin, **L. Visinelli**, and T. T. Yanagida, *Cosmic Birefringence and Electroweak Axion Dark Energy*, *Phys. Rev. D* **104**, L101302 [[hep-ph/2106.12602](#)] (2021).

44. A. Litsa, K. Freese, E. Sfakianakis, P. Stengel, and **L. Visinelli**, *Large Density Perturbations from Reheating to Standard Model particles due to the Dynamics of the Higgs Boson during Inflation*, *Phys. Rev. D* **104** 12, 123546 [[hep-ph/2009.14218](#)] (2021).
43. T. Edwards, B. Kavanagh, **L. Visinelli**, and C. Weniger, *Transient Radio Signatures from Neutron Star Encounters with QCD Axion Miniclusters*, *Phys. Rev. Lett.* **127**, 131103 [[hep-ph/2011.05378](#)] (2021).
42. B. Kavanagh, T. Edwards, **L. Visinelli**, and C. Weniger, *Stellar Disruption of Axion Miniclusters in the Milky Way*, *Phys. Rev. D* **104**, 063038 [[astro-ph/2011.05377](#)] (2021).
41. S. Vagnozzi, **L. Visinelli**, P. Brax, A. C. Davis, and J. Sakstein, *Direct detection of dark energy: the XENON1T excess and future prospects*, *Phys. Rev. D* **104**, 063023 [[hep-ph/2103.15834](#)] (2021).
40. B. Carr, F. Kühnel, and **L. Visinelli**, *Black Holes and WIMPs: All or Nothing or Something Else*, *Mon. Not. Roy. Astron. Soc.* **506** 3, 3648 (2021) [[astro-ph/2011.01930](#)] (2021).
39. E. di Valentino, O. Mena, S. Pan, **L. Visinelli**, W. Yang, A. Melchiorri, D. F. Mota, A. G. Riess, and J. Silk, *In the Realm of the Hubble tension - a Review of Solutions*, *Class. Quant. Grav.* **38**, 153001 [[astro-ph/2103.01183](#)] (2021).
38. N. Ramberg and **L. Visinelli**, *QCD axion and gravitational waves in light of NANOGrav results*, *Phys. Rev. D* **103**, 063031 [[astro-ph/2012.06882](#)] (2021).
37. T. Rindler-Daller, K. Freese, R. Townsend, and **L. Visinelli**, *Stability and Pulsation of the First Dark Stars*, *Mon. Not. Roy. Astron. Soc.* **503** 3, 3677 [[astro-ph/2011.00231](#)] (2021).
36. B. Carr, F. Kühnel, and **L. Visinelli**, *Constraints on Stupendously Large Black Holes*, *Mon. Not. Roy. Astron. Soc.* **501** 2, 2029 [[astro-ph/2008.08077](#)] (2021).
35. E. di Valentino *et al*, *Cosmology Intertwined IV: The Age of the Universe and its Curvature*, *Astropart. Phys.* **131**, 102607 [[astro-ph/2008.11286](#)] (2021).
34. E. di Valentino *et al*, *Cosmology Intertwined III:  $f\sigma_8$  and  $S_8$* , *Astropart. Phys.* **131**, 102604 [[astro-ph/2008.11285](#)] (2021).
33. E. di Valentino *et al*, *Cosmology Intertwined II: The Hubble Constant Tension*, *Astropart. Phys.* **131**, 102605 [[astro-ph/2008.11284](#)] (2021).
32. E. di Valentino *et al*, *Cosmology Intertwined I: Perspectives for the Next Decade*, *Astropart. Phys.* **131**, 102606 [[astro-ph/2008.11283](#)] (2021).
31. L. Di Luzio, M. Giannotti, E. Nardi, and **L. Visinelli**, *The landscape of QCD axion models*, *Physics Reports* **1**, 870 [[hep-ph/2003.01100](#)] (2020). [Corrigendum: *Physics Reports* **6**, 006 (2022).]
30. S. Vagnozzi, C. Bambi, and **L. Visinelli**, *Concerns regarding the use of black hole shadows as standard rulers*, *Class. Quant. Grav.* **37**, 8 [[gr-qc/2001.02986](#)] (2020).
29. S. Vagnozzi, **L. Visinelli**, O. Mena, and D. Mota, *Do we have any hope of detecting scattering between dark energy and baryons through cosmology?*, *Mon. Not. R. Astron. Soc.* **493** 1, 1139 [[gr-qc/1911.12374](#)] (2020).
28. **L. Visinelli** and J. Redondo, *Axion Miniclusters in Modified Cosmological Histories*, *Phys. Rev. D* **101**, 023008 [[hep-ph/1808.01879](#)] (2020).
27. **L. Visinelli**, S. Vagnozzi, and U. Danielsson, *Revisiting a negative cosmological constant from low-redshift data*, *Symmetry* **11**(8), 1035, Special Issue [[astro-ph/1907.07953](#)] (2019).



26. T. Tenkanen and **L. Visinelli**, *Axion dark matter from Higgs inflation with an intermediate  $H_*$* , *JCAP* **1908**, 033 [[astro-ph/1906.11837](#)] (2019).
25. E. Di Valentino, R. Ferreira, **L. Visinelli**, and U. Danielsson, *Late time transitions in the quintessence field and the  $H_0$  tension*, *Phys. Dark Univ.* **26**, 100385 [[astro-ph/1906.11255](#)] (2019).
24. C. Bambi, K. Freese, S. Vagnozzi, and **L. Visinelli**, *Testing the rotational nature of the supermassive object M87\* from the circularity and size of its first image*, *Phys. Rev. D* **100**, 044057 [[gr-qc/1904.12983](#)] (2019).
23. S. Vagnozzi and **L. Visinelli**, *Hunting for extra dimensions in the shadow of M87\**, *Phys. Rev. D* **100**, 024020 [[gr-qc/1905.12421](#)] (2019).
22. N. Ramberg and **L. Visinelli**, *Probing the Early Universe with Axion Physics and Gravitational Waves*, *Phys. Rev. D* **99**, 123513 [[astro-ph/1904.05707](#)] (2019).
21. W. H. Kinney, S. Vagnozzi, and **L. Visinelli**, *The Zoo Plot Meets the Swampland: Mutual (In)Consistency of Single-Field Inflation, String Conjectures, and Cosmological Data*, *Class. Quant. Grav.* **36**, 11 [[astro-ph/1808.06424](#)] (2019).
20. **L. Visinelli** and S. Vagnozzi, *Cosmological window onto the string axiverse and the supersymmetry breaking scale*, *Phys. Rev. D* **99**, 063517 [[hep-ph/1809.06382](#)] (2019).
19. S. Boucenna, F. Kühnel, T. Ohlsson, and **L. Visinelli**, *Novel Constraints on Mixed Dark-Matter Scenarios of Primordial Black Holes and WIMPs*, *JCAP* **1807**, 003 [[hep-ph/1712.06383](#)] (2018).
18. K. Freese, E. Sfakianakis, P. Stengel, and **L. Visinelli**, *The Standard Model Higgs Boson can delay Reheating in Inflation*, *JCAP* **1805**, 067 [[hep-ph/1712.03791](#)] (2018).
17. **L. Visinelli**, N. Bolis, and S. Vagnozzi, *Brane-world extra dimensions in light of GW170817*, *Phys. Rev. D* **97**, 064039 [[gr-qc/1711.06628](#)] (2018).
16. **L. Visinelli**, S. Baum, J. Redondo, K. Freese, F. Wilczek, *Dilute and dense axion stars*, *Phys. Lett. B* **777**, 64 [[astro-ph/1710.08910](#)] (2018).
15. **L. Visinelli**, *(Non-)thermal production of WIMPs during kination*, *Symmetry* **10**, 546 [[astro-ph/1710.11006](#)] (2018).
14. **L. Visinelli**, *Light axion-like dark matter must be present during inflation*, *Phys. Rev. D* **96**, 023013 [[astro-ph/1703.08798](#)] (2017).
13. S. Baum, **L. Visinelli**, K. Freese, and P. Stengel, *Dark matter capture, sub-dominant WIMPs, and neutrino observatories*, *Phys. Rev. D* **95**, 043007 [[astro-ph/1611.09665](#)] (2017).
12. **L. Visinelli**, *Observational Constraints on Monomial Warm Inflation*, *JCAP* **1607**, 054 [[astro-ph/1605.06449](#)] (2016).
11. **L. Visinelli**, *Condensation of Galactic Cold Dark Matter*, *JCAP* **1607**, 009 [[hep-ph/1509.05871](#)] (2016).
10. **L. Visinelli**, S. Masina, M. Vichi, A. Storto, and T. Lovato, *Impacts of Data Assimilation on the Global Ocean Carbonate System*, *Journal of Marine Systems* **158**, 106 (2016).
9. **L. Visinelli** and P. Gondolo, *Kinetic decoupling of WIMPs: analytic expressions*, *Phys. Rev. D* **91** 8, 083526 [[astro-ph/1501.02233](#)] (2015).

8. **L. Visinelli**, *Neutrino flavor oscillations in a curved space-time*, *Gen. Rel. Grav.* **47** 5, 62 [[gr-qc/1410.1523](#)] (2015).
7. **L. Visinelli**, *Cosmological perturbations for an inflaton field coupled to radiation*, *JCAP* **1501**, 005 [[astro-ph/1410.1187](#)] (2015).
6. **L. Visinelli**, S. Masina, M. Vichi, and A. Storto, *Impacts of Physical Data Assimilation on the Global Ocean Carbonate System*, *Biogeosciences Discussions* **11** (4), 5399-5441 (2014).
5. P. Gondolo and **L. Visinelli**, *Axion Cold Dark Matter in view of BICEP2 results*, *Phys. Rev. Lett.* **113**, 011802, Editor's Suggestion [[hep-ph/1403.4594](#)] (2014).
4. **L. Visinelli**, *Axion-Electromagnetic Waves*, *MPLA* **28**, 35 [[physics.class-ph/1401.0709](#)] (2013).
3. **L. Visinelli**, *Natural Warm Inflation*, *JCAP* **1109**, 013 [[astro-ph/1107.3523](#)] (2011).
2. **L. Visinelli** and P. Gondolo, *Axions Cold Dark Matter in Nonstandard Cosmologies*, *Phys. Rev. D* **81**, 063508 [[astro-ph/0912.0015](#)] (2010).
1. **L. Visinelli** and P. Gondolo, *Dark Matter Axions Revisited*, *Phys. Rev. D* **80**, 035024 [[astro-ph/0903.4377](#)] (2009).

## Technical reports

5. R. X. Adhikari *et al*, *Report of the Topical Group on Cosmic Probes of Fundamental Physics for for Snowmass 2021* [[hep-ex/2209.11726](#)] (2022).
4. J. Jaeckel, G. Rybka, L. Winslow, *et al*, *Axion Dark Matter* [[hep-ex/2203.14923](#)] (2022).
3. D. Antypas *et al*, *New Horizons: Scalar and Vector Ultralight Dark Matter* [[hep-ex/2203.14915](#)] (2022).
2. C. Benedetti *et al*, *Advanced accelerator linear collider demonstration facility at intermediate energy* [[physics.acc-ph/2203.08425](#)] (2022).
1. D. Alesini *et al*, *KLASH Conceptual Design Report* [[ins-det/1911.02427](#)] (2019).

## Articles currently under review

2. G. Montefalcone, V. Aragam, **L. Visinelli**, and K. Freese, *Constraints on the scalar-field potential in warm inflation*, Submitted to *Phys. Rev. D* [[gr-qc/2209.14908](#)] (2022).
1. S. Vagnozzi, R. Roy, Y.-D. Tsai, **L. Visinelli**, and others, *Horizon-scale tests of gravity theories and fundamental physics from the Event Horizon Telescope image of Sagittarius A\**, submitted to *Phys. Rev. D* [[gr-qc/2205.07787](#)] (2022).

## Proceedings

2. **L. Visinelli**, *Analytic expressions for the kinetic decoupling of WIMPs*, *Journal of Physics - Conference Series* **718** [[astro-ph/1601.00817](#)] (2016).
1. **L. Visinelli** and P. Gondolo, *Axion Cold Dark Matter Revisited*, *Journal of Physics - Conference Series* **203** [[astro-ph/0910.3941](#)] (2010).



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## Articles in preparation

3. A. D'Elia *et al*, *Search for axions with the Finuda magnet for Light Axion Search (FLASH) haloscope at INFN*, in preparation (collaboration with Frascati laboratories).
2. L. Walters *et al*, *A search for axions-photon conversions in the Andromeda galaxy using the Green Bank Telescope*, in preparation (collaboration with astronomers at University of Virginia).
1. V. Aragam, G. Montefalcone, **L. Visinelli**, and K. Freese, *On the numerical computation of perturbations in warm inflation*, in preparation.

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## White papers

Currently contributing to the Next generation Event Horizon Telescope (**ngEHT**) White Paper (in preparation), based on my experience with the articles 2205.06238, 2112.06932, 2001.02986, 1904.12983.

## Invited talks

48. 02/09/23 Napoli (IT), The interplay of primordial black holes, dark matter, and axions
47. 02/09/23 Trento (IT), The interplay of primordial black holes and particle dark matter
46. 02/06/23 Ferrara (IT), The interplay of primordial black holes and particle dark matter
45. 01/26/23 DESY (DE), Novel Cosmological Bounds on Thermally-produced Axion-like Particles
44. 05/20/22 Chinese Academy of Science, Beijing (CHN), Radio signals from axions conversion
43. 04/27/22 KEK, Tsukuba (JP), Radio signals from axions conversion
42. 04/08/22 Indian Institute of Technology, Mumbai (IN), Superradiance evolution of black hole shadows
41. 12/15/21 Helsinki Institute of Physics (FI), Axion miniclusters in the Milky Way
40. 10/14/21 SISSA, Trieste (IT), Radio signals from axion miniclusters colliding with neutron stars
39. 06/11/21 University of L'Aquila (IT), The population of axion miniclusters in the Galaxy
38. 04/26/21 Shanghai Jiao Tong University, Shanghai (CHN), Direct detection of dark energy
37. 02/17/21 Kavli IPMU, Tokyo (JP), *The interplay of primordial black holes and particle dark matter*
36. 11/04/20 Institute of Physics, Academia Sinica (TW), *Compact objects and dark matter*
35. 10/13/20 Undergraduate seminar, Colgate University (NY), *One dark matter candidate: the axion*
34. 06/04/20 International Institute of Physics, Natal (BR), *Radio and gravitational wave signals from cosmic axions* [[LINK to the YouTube video on the IIP channel: https://rb.gy/tsg0of](https://rb.gy/tsg0of)]
33. 05/11/20 Newton 1665 webinars series, *New physics out of the Shadow*  
[[LINK to the YouTube video on the Newton1665 channel: https://www.youtube.com/watch?v=yCDUfv8oKY](https://www.youtube.com/watch?v=yCDUfv8oKY)]
32. 04/29/20 Latin American Webinars (LAWphysics) series, *Astrophysics with axion stars and miniclusters*  
[[LINK to the YouTube video on the LAWphysics channel: https://www.youtube.com/watch?v=ilfmBKMgyH8](https://www.youtube.com/watch?v=ilfmBKMgyH8)]
31. 04/07/20 University of Texas at Austin (USA), *The future of light boson dark matter*
30. 03/02/20 DAMTP Institute of Astronomy, University of Cambridge (UK), *Light boson dark matter*
29. 12/20/19 National Institute Of Chemical Physics And Biophysics, Tallinn (ES), *Light boson dark matter*
28. 11/27/19 Fudan University, Shanghai (CHN), *Testing the rotational nature of the supermassive object M87\**
27. 11/25/19 Shanghai Jiao Tong University, Shanghai (CHN), *Light bosons as dark matter candidates*
26. 11/07/19 Nordita, Stockholm (SE), *Testing the rotational nature of the supermassive object M87\**
25. 05/21/19 INFN Frascati, Rome (IT), *Axion miniclusters and implications for axion detection*
24. 05/10/19 Wayne State University, MI (USA), *Probing the Early Universe with Axion Physics*
23. 05/01/19 Kavli Institute for Cosmological Physics, IL (USA), *Probing the Early Universe with Axions*
22. 04/30/19 Argonne National Laboratory, IL (USA), *Probing the Early Universe with Axions*

21. 04/25/19 University of Michigan, MI (USA), *The Quest for the Axion*
20. 04/17/19 Barry University, FL (USA), *Introduction to Cosmology and Particle Physics*
19. 04/12/19 University of Florida, FL (USA), *Probing the Early Universe with Axion Physics*
18. 04/04/19 IFIC, Valencia (ES), *Probing the Early Universe with Axions*
17. 01/08/19 SISSA, Trieste (IT), *The Cold Dark Matter axion and Axion Stars*
16. 10/23/18 Nikhef Amsterdam (NL), *The Quest for the Axion*
15. 11/30/18 INFN Frascati, Rome (IT), *Motivations for the search of light axions*
14. 10/23/18 University of Bologna (IT), *Searching for Axions and the String Axiverse in the Cosmo*
13. 10/18/18 INFN Frascati, Rome (IT), *Searching for Axions in the Lab and in the Cosmo*
12. 04/11/18 Latin American Webinars (LAWphysics) series, *The axion in cosmology and astrophysics*  
[LINK to the YouTube video on the LAWphysics channel: <https://www.youtube.com/watch?v=YWqVpPrpLjw>]
11. 02/01/18 CEICO, Prague (CZ), *The Cold Dark Matter axion and Axion Stars*
10. 12/01/17 University of Turin (IT), *The Cold Dark Matter axion and Axion Stars*
9. 08/16/17 University of Oslo (NO), *Dark matter capture and neutrino observatories*
8. 06/15/17 University of Bologna (IT), *Dark matter capture and neutrino observatories*
7. 02/01/07 University of Michigan, MI (USA), *Axion cold dark matter, miniclusters, and axion stars*
6. 10/25/16 University of Helsinki (FI), *Axion cold dark matter, status and perspectives*
5. 01/21/16 University of Zaragoza (ES), *Axion cold dark matter, status and perspectives*
4. 06/03/13 CMCC Lecce (IT), *Impacts of Data Assimilation on the Global Ocean Carbonate System*
3. 06/15/11 University of Pisa (IT), *Axion cold dark matter in standard and non-standard cosmologies*
2. 10/12/10 University of New Mexico, NM (USA), *An integral equation for distorted-wave amplitudes*
1. 05/21/09 University of Bologna (IT), *Axion cold dark matter revisited*

## Conference talks

36. 09/11-15 23 [Planned plenary talk on axions at TeVPA 2023](#) (Italy), *T.B.D. plenary talk on axions*
35. 06/19-21 23 [New Horizons in Primordial Black Hole physics \(NEHOP\)](#), Napoli (Italy), *Primordial black holes and particle dark matter are intimately intertwined*
34. 06/5-9 23 [Axion Across Boundaries](#), Galileo Galilei Institute, Arcetri (Italy), *Axions and inflation*
33. 02/23-24 23 [Kick-off Meeting of COST Action COSMIC WISPerS, INFN Frascati](#) (Italy), *Axions and PBHs*
32. 11/18-20 22 [Shanghai Particle Physics and Cosmology Symposium 2022](#) (CHN), *Novel Cosmological Bounds on Thermally-produced Axion-like Particles*
31. 11/29-12/03 21 [Sixth Colombian Meeting on High Energy Physics](#), Santa Marta (CO),  
*Plenary speaker: Future probes of light bosons*

30. 10/12-13/21 Cosmology Frontier in Particle Physics: Astroparticle Physics and Early Universe, NCTS NTU, *Axion miniclusters in the Milky Way*
29. 07/5-16/21 [Cosmology from Home 2021](#), *Direct detection of dark energy* [\[LINK to YouTube video\]](#)
28. 05/15/21 [TDLI International Workshop "Current Topics on Axion"](#), Shanghai Jiao Tong University, Shanghai (CHN), *Future probes of the axion landscape*
27. 10/13-16/20 The 5th IBS-IFT-MultiDark Workshop, Institute for Basic Science (IBS), Daejeon (KR), *Recent and future developments of dark matter axion physics*
26. 09/24/20 [CoCo 2020: Cosmology in Colombia](#), Bogotá (CO), *Constraints on Reheating to SM Particles due to Large Effective Higgs Boson Mass*
25. 08/24/20 [Cosmology from Home 2020](#), *Axion Miniclusters: Tidal Disruption and Radioastronomy* [\[LINK\]](#)
24. 07/21/20 [IDM2020](#), Zurich (CH), *The future of Axion Physics*
23. 12/2-6/19 [TeVPA 2019](#), Sydney (AU), *Probing the Early Universe with Axion Physics*
22. 06/24-06/26 [Vera Rubin Fest](#), Washington DC (USA), *Axions*
21. 06/10-14/19 [Invisibles19](#), Valencia (ES), *Coordinating one of the panel discussion session*
20. 12/18/18 [SLAP 2018](#), King's College London (UK), *The Cold Dark Matter axion and Axion Stars*
19. 12/11/18 [The quest for New Physics](#), Instituto de Física Corpuscular (ES), *Axion Stars*
18. 09/05/18 [Invisibles18 Workshop](#), Karlsruhe Institute of Technology (DE), *Dilute and dense axion stars*
17. 06/20/18 [14th Patras Workshop](#), DESY Hamburg (DE),  
*The Higgs Boson can delay Reheating after Inflation*
16. 06/12/18 [Preparing for Dark Matter Particle Discovery](#), Chalmers University of Technology, Goteborg (SE),  
*The Higgs Boson can delay Reheating after Inflation*
15. 03/07/18 [Ultralight Dark Matter and Axions](#), University of Michigan (USA),  
*The parameter space of axion-like particles*
14. 02/22/18 [UCLA Dark Matter 2018](#), UCLA (USA), *Axions in cosmology and astrophysics*
13. 08/31/17 [DavCO](#), CP<sup>3</sup> Origin (DK), *Axions and ALPs as the Cold Dark Matter*
12. 08/04/17 [Self-interacting dark matter](#), Niels Bohr Institute (DK), *Sharpening Fuzzy Dark Matter*
11. 07/19/17 [Advances in Theoretical Cosmology in Light of Data](#) Nordita (SE), *Axion dark matter*
10. 12/06/16 [Axion Dark Matter workshop](#), Nordita (SE), *Axion dark matter, miniclusters, and axion stars*
9. 08/12/16 [IDM2016](#), Sheffield (UK), *Galactic Cold Dark Matter from First Principles*
8. 09/07/15 [TAUP 2015](#), Turin (IT) *Analytical expressions for the kinetic decoupling of WIMPs*
7. 11/19/14 [GEOCARBON Final Meeting](#), Paris (FR),  
*Summary contribution to GEOCARBON from Land and Ocean Components*
6. 07/08/14 [NEMO Users Meeting](#), Grenoble (FR),  
*Assimilation of Physical and Carbonate Data on the Global Ocean Carbonate System*

5. 10/15/10 [American Physical Society Four Corners Meeting](#), Ogden (USA),  
*An integral equation for distorted-wave amplitudes*
4. 07/13/10 [PPC 2010 Conference](#), Turin (IT), *An integral equation for distorted-wave amplitudes*
3. 03/28/10 [SnowPac & SnowCluster 2010](#), Alta (USA), *Axion dark matter in non-standard cosmologies*
2. 07/02/09 [TAUP 2009](#), Rome (IT), *Axion cold dark matter revisited*
1. 10/20/07 [American Physical Society Four Corners](#), Flagstaff (USA),  
*Oscillation amplitude for neutrino wave packets*

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## Workshop attendance

- May 2023 [Axions across boundaries between Particle Physics, Astrophysics, Cosmology and forefront Detection Technologies](#), Galileo Galilei Institute, Arcetri (IT)
- April 2017 [The 5th MCTP Spring Symposium](#), Ann Arbor, MI (USA)
- September 2014 [Data Assimilation in Ocean Physics](#), Trieste (Italy)
- June 2013 [Advanced School on Data Assimilation](#), Bologna (Italy)
- December 2009 [Focus week on indirect dark matter search](#), IPMU Tokyo (Japan)

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## Outreach: Presenting science to popular audience

- July 2022 South physics observatory astronomy summer camp "Astronomy for Future Scientists", The University of Utah. Host: Paul Ricketts.
- January 2022 Virtual interview with the online newspaper "Fanpage" on dark energy (in Italian) [\[Youtube link\]](#)
- September 2021 Interview for the podcast "co.scienza" (in Italian), aimed at young researchers [\[Link\]](#)
- August 2021 Public lecture "Le cinque ere dell'Universo e la vita su altri pianeti" (In Italian). Youtube links: [PART 1](#) [PART 2](#)
- August 2020 Public lecture "Buchi neri e onde gravitazionali: La ricerca in Italia" (In Italian). Youtube links: [PART 1](#) [PART 2](#)
- March 2016 Public lecture "Capire le onde gravitazionali" (In Italian), Bologna.
- November 2015 Public lecture "Physics for everybody!" (In Italian), Bologna.
- February 2013 Public lecture "Galileo, father of the scientific method" (In Italian), Bologna.
- April 2011 Public lecture "Dark Matters", The University of Utah, Math Department.

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## Visiting researcher

- 4/20–5/20 2019 University of Michigan (MI)
- Apr 10–20 2019 Barry University (FL)
- Jan 20–31 2019 INFN Frascati (IT)
- May 1–15 2017 Perimeter Institute (CA)
- Feb 25–30 2017 MIT (MA)
- Jan–Feb 2017 University of Michigan (MI)

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## Additional work experience

- 2015 **Editing work for JCAP and JHEP**, Sissa-Medialab publications, Trieste (Italy)
- 2015 – 2016 **High school teacher**, Private High School "M. Malpighi", Bologna (Italy)
- 2015 – 2016 **High school teacher**, Public High School "E. Majorana", Bologna (Italy)
- 2011 – 2016 **Private tutoring** in mathematics and physics for high school and university students.
- 2012 – 2013 **Quantitative Analyst**, Iason LTD, Milan [www.iasonltd.com](http://www.iasonltd.com).  
I have implemented a set of numerical codes aimed at pricing defaultable coupon bonds in C/C++, Matlab, Excel. My personal contribution has been cited in:  
A. Castagna and F. Fede, [Measuring and Managing Liquidity Risk](#), Wiley (2013).
- 2011 – 2012 **Editor for high-school mathbooks**, Zanichelli Editore.



## Other Experiences

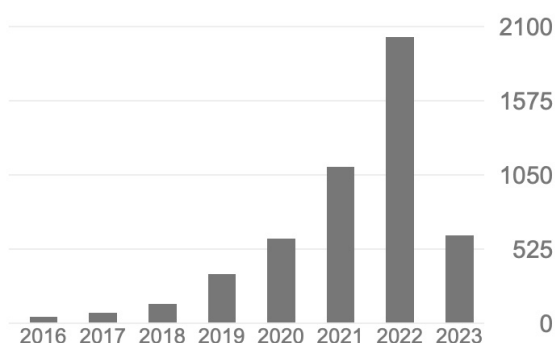
2015 - today	<b>Voluntary affiliation, Italian Civil Protection Department, Loiano (Bologna), Italy.</b>
2014 - 2016	<b>Elected as Town Councilor, Comune di Loiano (Bologna), Italy.</b>
September 2011	<b>Mathematics and Finance, Università di Bologna, Italy.</b>
- March 2012	Intensive six-months course on: Stochastic Calculus, Assessment of Financial Risk, Computational Finance, Application of Big Data to Finance, Interest Rates and Risk

## Other Interests

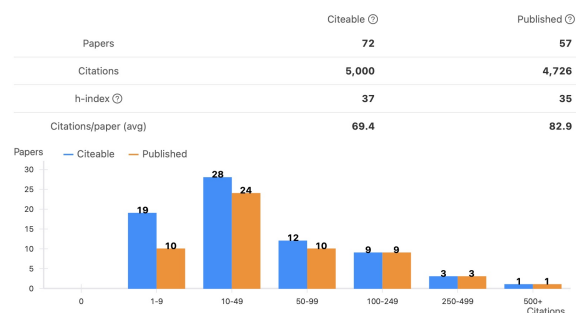
Music	I play both electric and classical guitar. I have played in several groups spanning different styles (blues, rock, metal).
Sport	I have practiced Chinese Martial Arts for several years. I train regularly.
Books	I usually read during holidays, especially science fiction and philosophical essays.

## Summary of statistics as of March 17, 2023

	All	Since 2018
Citations	5175	4873
h-index	36	35
i10-index	53	52



Citations per year (Google Scholars)



Total number of citations (HEP-INSPIRE)

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## Professional references addressing my research activity

**Katherine Freese**

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**Paolo Gondolo**

**Full Professor (Ph.D. supervisor),**

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## Professional references addressing my teaching activity

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**Professor and former director,**

- Oskar Klein Centre, Stockholm University  
Roslagstullsbacken 21 A 10691 Stockholm, Sweden.  
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## Additional references

**Frank Wilczek**

**Nobel Prize recipient and Full Professor,**

- Department of Physics, Massachusetts Institute of Technology  
77 Massachusetts Ave, 6-301. Cambridge, MA 02139, United States of America;
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