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# Fabio Pacucci

*Curriculum Vitae & Publication List*

## Research & Education

2019–present **Clay Fellow**,
*Harvard University & Smithsonian Astrophysical Obs., Cambridge (MA)*, USA.

2019–present **BHI Fellow**,
*Harvard University & Smithsonian Astrophysical Obs., Cambridge (MA)*, USA.

2018–2019 **NOVA Fellow**,
*Kapteyn Astronomical Institute*, Netherlands.

2016–2018 **Postdoctoral Research Associate**,
*Yale University - Department of Physics, New Haven (CT)*, USA.

2012–2016 **Ph.D. in Physics**, *Scuola Normale Superiore (SNS)*, Italy.
Thesis title: *The First Black Holes in the Cosmic Dark Ages*
Advisor: Prof. Andrea Ferrara, Grade: 70/70 cum laude

## Honors and Awards

2019 **Clay Fellowship (Center for Astrophysics | Harvard & Smithsonian)**

2019 **BHI Fellowship (Harvard University)**

2019 **Giacconi Fellowship (Space Telescope Science Institute), declined**

2018 **IAU Ph.D. Prize** – International Astronomical Union prize for Ph.D. Thesis

2017 **Livio Gratton Prize** - Best Ph.D. Thesis in Astronomy in Italy in the period 2014-2016

2017 **American Astronomical Society "International Travel Grant" Award**

2016 **Yale Postdoctoral Scholars Travel Fund Award**

2012 **Enrico Persico Prize 2011-2012** - Accademia Nazionale dei Lincei prize for exceptional achievements in Physics

2012 **ASI-ISSNAF (Italian Space Agency) 2012 Internship Program Winner**

2007–2012 **Fellowship at the "Lamaro-Pozzani" University College in Rome**

2007 **Rotary Club prize** - Exceptional achievements during high-school studies

## Observing Time Awarded

2018 **Co-I of a Magellan proposal** - 2 nights (IMACS) to observe $z > 6$ candidates.

2018 **PI of a Keck proposal** - 2 nights (MOSFIRE) to observe the galaxy CR7.

2017 **PI of a Chandra theory proposal** - Improving the Multi-Wavelength Capability of Chandra Large Programs. The total grant is for $87,000.

2016 **Co-I of a HST proposal** - 4 orbits granted during Cycle 24, to observe the Ly-$\alpha$ emitter CR7. The total grant is for $69,186.

2016 **Co-I of a Keck proposal** - 3 nights with DEIMOS to observe high-z AGNs.

## Publication Record (from NASA ADS)

Total number of papers: 68
Total number of citations (ADS): 1582
**Number of published first-author papers: 31**
**H-index (ADS): 24**
**m-index (ADS): 3**

## Peer-Reviewed Publication List

Note: The order in the author list is reported as either first author or co-author.

1. **Pacucci F.**, Foord A., Gordon L., Loeb A., *Lensing in the Darkness: A Bayesian Analysis of 22 Chandra Sources at z > 6 Shows No Evidence of Lensing*, MNRAS accepted
2. Seepaul, Bryan, **Pacucci F.**, Narayan, R., *Detectability of Wandering Intermediate-Mass Black Holes in the Milky Way Galaxy from Radio to X-rays, eprint arXiv:2204.12498*
3. LISA Astrophysics WG, **Pacucci F.**, et al., *Astrophysics with the Laser Interferometer Space Antenna*, submitted to Living Reviews In Relativity, eprint arXiv:2203.06016
4. LISA Cosmology WG, **Pacucci F.**, et al., *Cosmology with the Laser Interferometer Space Antenna*, submitted to Living Reviews In Relativity, eprint arXiv:2204.05434
5. Chen H., Ricarte A., **Pacucci F.**, *Prospects to Explore High-redshift Black Hole Formation with Multi-band Gravitational Waves Observatories*, submitted to ApJ Letters, eprint arXiv:2202.04764
6. Weller E. J., **Pacucci F.**, Hernquist L., Bose S., *Dynamics of Intermediate-Mass Black Holes Wandering in the Milky Way Galaxy Using the Illustris TNG50 Simulation*, MNRAS, Volume 511, Issue 2, April 2022, Pages 2229–2238
7. **Pacucci F.**, Dayal P., Harikane Y., Inoue A. K., Loeb A., *Are the Newly-Discovered z 13 Drop-out Sources Starburst Galaxies or Quasars?*, MNRAS Letters, Volume 514, Issue 1, pp.L6-L10
8. Harikane Y., **Pacucci F.**, et al., *A Search for H-Dropout Lyman Break Galaxies at z 13*, ApJ, 2022, Volume 929, Issue 1, id.1, 15 pp.
9. **Pacucci F.** & Loeb A., *The Search for the Farthest Quasar: Consequences for Black Hole Growth and Seed Models*, MNRAS, 2022, Volume 509, Issue 2
10. Outmezguine N. J., **Pacucci F.**, Loeb A., *Detection Prospects of Local Super-Massive Black Holes Based on the Sloan-Digital Sky Survey*, submitted for publication on ApJ, eprint arXiv:2108.10123
11. **Pacucci F.**, Mezcua M., Regan J. A., *The Active Fraction of Massive Black Holes in Dwarf Galaxies*, ApJ, 2021, Volume 920, Number 2
12. Vagnozzi S., **Pacucci F.**, Loeb A., *Implications for the Hubble tension from the ages of the oldest astrophysical objects*, eprint arXiv:2105.10421
13. Unal C., **Pacucci F.**, Loeb A., *Properties of Ultralight Bosons from Heavy Quasar Spins via Superradiance*, JCAP, Volume 2021, Issue 05, id.007, 21 pp.

14. Yang J., **Pacucci F.**, et al., *Measurements of the z  6 Intergalactic Medium Optical Depth and Transmission Spikes Using a New z > 6.3 Quasar Sample*, ApJ, 2020, Volume 904, Issue 1, id.26, 28 pp.
15. Nunes R. C. & **Pacucci F.**, *Effects of the Hubble Parameter on the Cosmic Growth of the First Quasars*, MNRAS, 2020, Volume 496, Issue 1, pp.888-893.
16. Whalen D. J., **Pacucci F.**, et al., *Finding the First Quasars at Birth*, ApJ Letters, 2020, Volume 897, Issue 1, Article L16.
17. **Pacucci F.** & Loeb A., *Separating Accretion and Mergers in the Cosmic Growth of Black Holes with X-ray and Gravitational Wave Observations*, ApJ, 2020, Volume 895, Number 2.
18. **Pacucci F.** & Loeb A., *Reality or Mirage? Observational Test and Implications for the Claimed Extremely Magnified Quasar at* $z = 6.3$, ApJ, 2020, Volume 889, Number 1.
19. Baer R. E., **Pacucci F.**, et al., *BAT AGN Spectroscopic Survey – XIII. The nature of the most luminous obscured AGN in the low-redshift universe*, MNRAS, 2019, Volume 489, Issue 3, p.3073-3092.
20. Li Y., Cappelluti N., Hasinger G., Arendt R. G., Kashlinsky A., **Pacucci F.**, *Spectral Properties Of Populations Behind The Coherence In Spitzer Near-Infrared And Chandra X-Ray Backgrounds*, ApJ, 2019, Volume 883, Issue 1, article id. 64, 8 pp.
21. Sesana A., **Pacucci F.**, et al., *Unveiling the Gravitational Universe at* $\mu$*-Hz Frequencies*, White Paper submitted to ESA's Voyage 2050, arXiv:1908.11391.
22. Ricarte A., **Pacucci F.**, Natarajan P., Cappelluti N., *The Clustering of Undetected High-redshift Black Holes and Their Signatures in Cosmic Backgrounds*, MNRAS, 2019, Volume 489, Issue 1, p.1006-1022.
23. Haiman Z., **Pacucci F.**, et al., *Electromagnetic Window into the Dawn of Black Holes*, Astro2020, US Decadal Survey White Paper.
24. Wang L., **Pacucci F.**, et al., *JWST: Probing the Epoch of Reionization with a Wide Field Time-Domain Survey*, Astro2020, US Decadal Survey White Paper.
25. Fan X., **Pacucci F.**, et al., *The First Luminous Quasars and Their Host Galaxies*, Astro2020, US Decadal Survey White Paper.
26. **Pacucci F.**, Baldassare V., Cappelluti N., Fan X., Ferrara A., Haiman Z., Natarajan P., Ozel F., Schneider R., Tremblay G., Urry M., Valiante R., Vikhlinin A., Volonteri M., *Detecting the Birth of Supermassive Black Holes Formed from Heavy Seeds*, Astro2020, US Decadal Survey White Paper.
27. Natarajan P., **Pacucci F.**, et al., *Disentangling nature from nurture: tracing the origin of seed black holes*, Astro2020, US Decadal Survey White Paper.
28. Shankar F., **Pacucci F.**, et al., *Black hole scaling relations of active and quiescent galaxies: Addressing selection effects and constraining virial factors*, MNRAS, Volume 485, Issue 1, p.1278-1292.
29. Nguyen D., **Pacucci F.**, et al., *Improved dynamical constraints on the masses of the central black holes in nearby low-mass early-type galactic nuclei and the first black hole determination for NGC 205*, ApJ, 2019, Volume 872, Number 1.
30. **Pacucci F.** & Loeb A., *Most Lensed Quasars at* $z > 6$ *are Missed by Current Surveys*, ApJ Letters, 2019, Volume 870, Issue 2, Article L12.
31. Fan X., **Pacucci F.**, et al., *The Discovery of a Gravitationally Lensed Quasar at* $z = 6.51$, ApJ Letters, 2019, Volume 870, Number 2.
32. Woods T. E., **Pacucci F.**, et al., *Titans of the Early Universe: the Prato Statement on the Origin of the First Super-Massive Black Holes*, PASA review, 2019, Volume 36, id. e027.
33. **Pacucci F.**, Loeb A., Mezcua M., Martin-Navarro I., *Glimmering in the Dark: Modeling the Low-mass End of the* $M_\bullet - \sigma$ *Relation and of the Quasar Luminosity Function*, 2018, ApJ Letters,

Volume 864, Issue 1, article id. L6.

34. **Pacucci F.**, Natarajan P., Volonteri M., Cappelluti N., Urry C. M., *Conditions for Optimal Growth of Black Hole Seeds*, 2017, ApJ Letters, Volume 850, Issue 2, article id. 42.
35. Wang L., **Pacucci F.** et al., *A First Transients Survey with JWST: the FLARE project*, 2017, arXiv:1710.07005.
36. **Pacucci F.**, Loeb A., Salvadori S., *Gravitational Wave Sources from Pop III Stars are Preferentially Located within the Cores of their Host Galaxies*, 2017, MNRAS Letters, Volume 471, Issue 1, p. L72-L76.
37. Dayal P., Choudhury T., Bromm V., **Pacucci F.**, *Warm dark matter constraints from high-z Direct Collapse Black Holes using the JWST*, 2017, MNRAS, Volume 472, Issue 4, p. 4414-4421.
38. Gallerani S., Fan X., Maiolino R., **Pacucci F.**, *Physical properties of the first quasars*, 2017, PASA review, Volume 34, id. e022, 19 pp
39. Yue B., Ferrara A., **Pacucci F.**, Omukai K., *On Triggering the Formation of Direct Collapse Black Holes by their Congeners*, 2017, ApJ, Volume 838, Issue 2, article id. 111.
40. **Pacucci F.**, Ferrara A., Pallottini A., Gallerani S., *The nature of the Lyman Alpha Emitter CR7: a Persisting Puzzle*, 2017, MNRAS Letters, Volume 468, Issue 1, p. L77-L81.
41. Dayal P., Choudhury T., Bromm V., **Pacucci F.**, *Reionization and Galaxy Formation in Warm Dark Matter Cosmologies*, 2017, ApJ, Volume 836, Issue 1, article id. 16.
42. **Pacucci F.**, Natarajan P., Ferrara A., *Feedback Limits to Maximum Seed Masses of Black Holes*, 2017, ApJ Letters, Volume 835, Issue 2, article id. L36, 5 pp.
43. Natarajan P., **Pacucci F.**, Ferrara A., Agarwal B., Zackrisson E., Ricarte A., Cappelluti N., *Unveiling the first black holes with JWST: multi-wavelength spectral predictions*, 2017, ApJ, Volume 838, Issue 2, article id. 117.
44. Cappelluti N., Li Y., Ricarte A., Agarwal B., Ajello M., Civano F., Comastri A., Elvis M., Gilli R., Hasinger G., Marchesi S., Natarajan P., **Pacucci F.**, Tasnin Ananna T., Treister E., Urry C. M., *The X-ray Background in the Chandra Cosmos-Legacy Field I: Energy Spectrum and Undetected Populations in the [0.3-7] keV Band*, 2017, ApJ, Volume 837, Issue 1, article id. 19.
45. **Pacucci F.**, Ferrara A., Grazian A., Fiore F., Giallongo E., *First Identification of Direct Collapse Black Hole Candidates in the Early Universe in CANDELS/GOODS-S*, 2016, MNRAS, Volume 459, Issue 2, p.1432-1439.
46. Volonteri M., Habouzit M., **Pacucci F.**, Tremmel M., *The Evolution of High-Redshift Massive Black Holes*, 2015, Galaxies at High Redshift and Their Evolution over Cosmic Time, Proceedings IAU Symposium No. 319, 2015.
47. Pallottini A., Ferrara A., **Pacucci F.**, Gallerani S., Salvadori S., Schneider R., Schaerer D., Sobral D., Matthee J., *The Brightest Ly$\alpha$ Emitter: Pop III or Black Hole?*, 2015, MNRAS, Volume 453, Issue 3, p. 2465-2470.
48. **Pacucci F.**, Ferrara A., Volonteri M., Dubus G., *Shining in the Dark: the Spectral Evolution of the First Black Holes*, 2015, MNRAS, Volume 454, Issue 4, p. 3771-3777.
49. **Pacucci F.**, Volonteri M., Ferrara A., *The Growth Efficiency of High-Redshift Black Holes*, 2015, MNRAS, Volume 452, Issue 2, p. 1922-1933.
50. **Pacucci F.**, Ferrara A., Marassi S., *Gravitational Waves from Direct Collapse Black Holes Formation*, 2015, MNRAS, Volume 449, Issue 1, p. 1076-1083.
51. **Pacucci F.**, Ferrara A., *Simulating the Growth of Intermediate Mass Black Holes*, 2015, MNRAS, Volume 448, Issue 1, p. 104-118.

52. Dayal P., Mesinger A., **Pacucci F.**, *Early Galaxy Formation in Warm Dark Matter Cosmologies*, 2015, ApJ, Volume 806, Issue 1, article id. 67.
53. Dayal P., Ferrara A., Dunlop J., **Pacucci F.**, *Essential Physics of Early Galaxy Formation*, 2014, MNRAS, Volume 445, Issue 3, p. 2545-2557.
54. **Pacucci F.**, Mesinger A., Mineo S., Ferrara A., *The X-ray Spectra of the First Galaxies: 21 cm Signatures*, 2014, MNRAS, Volume 443, Issue 1, p. 678-686.
55. **Pacucci F.**, Mesinger A., Haiman Z., *Focusing on Warm Dark Matter with Lensed High-Redshift Galaxies*, 2013, MNRAS Letters, Volume 435, Issue 1, p. L53-L57.
56. **Pacucci F.**, Ferrara A., D'Onghia E., *Detectability of Free Floating Planets in Open Clusters with the James Webb Space Telescope*, 2013, ApJ Letters, Volume 778, Issue 2, article id. L42.

## Talks/Seminars

### Review and Prize Talks

June 2022 **Astrophysics in the Next Decade: From the First Stars to Intelligent Life, Martha's Vineyard MA, USA**
To the Most Distant Galaxy and Beyond: A Scientific Journey

June 2021 **Aspen Center for Physics, 2021 Summer Program, Aspen CO, USA**
Black Hole Formation and Growth in the High Redshift Universe

24 Aug 2018 **IAU General Assembly, Vienna, Austria**
IAU Ph.D. Prize Talk: The First Black Holes in the Cosmic Dark Ages

2 Jul 2018 **The Early Growth of Supermassive Black Holes, Sexten, Italy**
A Multi-Wavelength View onto the First Black Hole Seeds

22 Nov 2017 **Workshop: "Titans of the Early Universe", Prato, Italy**
Feedback limits on the growth of the first black holes

### Invited Talks

6 May 2022 Speaker at the "The Night of Ideas", Boston (MA)

17 Mar 2022 Special Session talk, AAS HEAD 19, Pittsburgh (VA)

3 Nov 2021 Seminar, UConn, Storrs (CT)

14 Oct 2021 Seminar, Institute for Advanced Studies, Princeton (NJ)

16 Sept 2021 Speaker at the "Futurological Congress", Bolzano (Italy)

14 Sept 2021 Seminar, INAF Brera, Milan (Italy)

17 Nov 2020 Colloquium, SISSA (Trieste, Italy)

30 Oct 2020 AAS HEAD division talk, virtual

28 Oct 2020 HEAD Talk, Center for Astrophysics | Harvard & Smithsonian, Cambridge (MA), USA

22 Sept 2020 Colloquium, NRC Herzberg Astronomy & Astrophysics, Victoria, Canada

22 Sept 2020 Colloquium, University of British Columbia, Vancouver, Canada

8 Sept 2020 Talk, "Origin, growth and feedback of black holes in dwarf galaxies" virtual conference

1-2 Jun 2020 Press conference and Science talk, AAS 236th meeting, virtual

30 Jan 2020 Colloquium, ITC, Harvard University, Cambridge (MA), USA

19 Oct 2019 Talk, AHA Workshop, University of Miami, Miami (FL), USA

13 Mar 2019 Colloquium, University of Connecticut, Storrs, (CT), USA

12 Mar 2019 Colloquium, Black Hole Initiative (Harvard University), Cambridge (MA), USA

6 Mar 2019 HEAD Talk, Center for Astrophysics | Harvard & Smithsonian, Cambridge (MA), USA

16 Nov 2018 Talk, ITC, Center for Astrophysics | Harvard & Smithsonian, Cambdridge (MA), USA

2 Oct 2018 Colloquium, Dartmouth College, Hanover (NH), USA

28 Mar 2018 Physics Colloquium, University of Miami, Miami (FL), USA

12 Mar 2018 CosmoClub Talk, UC Santa Cruz, Santa Cruz (CA), USA

26 Oct 2017 Colloquium, Yale Astronomy Department, New Haven (CT), USA

3 Oct 2017 Colloquium, INAF - OAR, Astronomical Observatory of Rome, Italy

22 Aug 2017 Talk, HEAD Meeting 2017, Sun Valley (ID), USA

23 Jun 2017 Talk, Yale Society of Physics Student, New Haven (CT), USA

13 Jun 2017 Talk, Elusive AGN in the Next Era, George Mason University, Fairfax (VA), USA

22 Mar 2017 Talk, Science with the Hubble and James Webb Space Telescopes, Venice, Italy

16 Dec 2016 Colloquium, The First Black Holes, CCA (Simons Foundation), NYC (NY), USA

5 Jul 2016 Colloquium, Kapteyn Astronomical Institute, Groningen, The Netherlands

3 Mar 2016 Talk, Columbia University, NYC (NY), USA

24 Feb 2016 Talk, Yale University, New Haven (CT), USA

12 Feb 2016 Talk, ITC, Center for Astrophysics | Harvard & Smithsonian, Cambdridge (MA), USA

15 Jan 2016 Colloquium MPA Garching, Germany

7 Oct 2015 Talk, X DAVID International Workshop - Scuola Normale Superiore, Italy

12 Feb 2015 Talk, IAP Paris, France

14 Oct 2014 Talk, IX DAVID International Workshop - Scuola Normale Superiore, Italy

23 Oct 2013 Talk, VIII DAVID International Workshop - Scuola Normale Superiore, Italy

**Contributed Talks**

14 June 2022 Talk, AAS Summer Meeting 2022, Pasadena

1 May 2022 Talk, IMBH: New Science from Stellar Evolution to Cosmology Workshop 2022, Puerto Rico

17 Dec 2021 Talk, BLAST Workshop 2021, virtual

10 Jan 2019 Talk, AAS Winter Meeting 2019, Seattle (WA), USA

20 Mar 2018 Talk, AAS HEAD Meeting 2018, Rosemont (IL), USA

24 Jun 2015 Talk, EWASS 2015 Conference, Spain

24 Sept 2014 Talk, Meeting of the Italian Physical Society, Italy

24 Jun 2014 Tak, Chalonge Meudon Workshop 2014 - Meudon Observatory, France

## Teaching & Professional Service

2021 **Member of the Postdoc Committee for the CfA Director search**

2021 **Panelist - NASA GO proposal review (program name not disclosed)**

2020–2023 **Committee Member for the CfA Colloquium Series**

2019–2023 **Committee Member for the BHI Colloquium Series**

2020–present **Member of the CfA Postdoc Council**

2019–present **Manager of the outreach activities** for the Black Hole Initiative at Harvard University, funded by the John Templeton Foundation and the Gordon and Betty Moore Foundation.

2018–present **Educator for 9 TED-Ed video productions about science, most of them related to black holes**. I directed teams of $\sim$ 10 people (animators, script writers, narrators). Each video was viewed $\sim 200,000$ times in the first day after release and they have been translated into 25 languages. Overall, the 5 videos have several millions of views. This effort was covered by an article on the Harvard Gazette.

2020-2023 **Student Advisor:** Mentoring of the high-school student Sarah Gardner from the Ossining High School in NY for the three-year Ossining Science Research Program.

2021 **Attended "Intensive Science Undergraduate Mentoring Workshop at Harvard FAS"**

2021 **Student Advisor for the Harvard undergraduates Ray Fitzgerald, Bryan Seepaul (PRISE program winner), Emma Weller (PRISE program winner) and Kaylie Hausknecht:** Mentoring of Harvard undergraduates in semester or summer projects.

2021 **Student Advisor for the Harvard undergraduates Rafid Quayum (PRISE program winner), Rui Zhe Lee, Bryan Seepaul (PRISE program winner), Emma Weller (PRISE program winner):** Mentoring of Harvard undergraduates in semester or summer projects.

2020 **Student Advisor for the Harvard undergraduate Lucia Gordon:** Mentoring of the undergraduate student on the project: "Looking for Gravitationally Lensed Quasars with BAYMAX", with Adi Foord and Avi Loeb.

2020 **Student Mentor for the Banneker Institute program at Harvard University:** I mentored the graduate student Emmanuel Durodola from California State University (CA) on the project: "Photometry of Black Hole Seed Candidates".

202-2022 **Member of the Scientific Organizing Committee (SOC)** for the Black Hole Initiative at Harvard Conference 2020, 2022.

2020 **Session Chair:** American Astronomical Society (AAS) 236th meeting.

2022 **Session Chair:** American Astronomical Society (AAS) 240th meeting.

2018 **Development of the Black Hole Calculator:** online calculator providing a convenient portrait of a black hole given its properties, in two units of measure. The calculator is a useful tool for research and teaching purposes and it is used by a daily average of $\sim 150$ people worldwide.

2018–2019 **Member of the IAU Executive Committee for Junior Members**

2015–present **Reviewer:** ApJ, ApJ Letters, MNRAS, MNRAS Letters, Astronomy & Astrophysics, NSF proposals, NASA Astrophysics Division FINESST-19, FINESST-20, FINESST-21 proposals, Chambliss AAS poster contest.

2018 **Summer Student Mentor:** I mentored the senior student Qingyuan Qian from Great Neck North High School on Long Island (NY) on the project: "The $M_\bullet - M_{\rm bulge}$ relation for intermediate-mass black holes".

2017 **Teaching Assistant** for the course "Gravity, Astrophysics and Cosmology" (Yale University, USA), for undergraduate students majoring in Astronomy.

2013–2015 **Teaching Assistant** for several undergraduate courses (e.g., classical mechanics, electromagnetism) and for the graduate course "Structure Formation in the Early Universe".

2015–present **Active member of the following professional societies:** Associate Member of LISA Consortium, Junior Member of IAU (International Astronomical Society), Member of the New Haven Rotary Club, Full Member of AAS (American Astronomical Society), Full Member of ISSNAF (Italian Scientists and Scholars in North America Foundation), Member of Scuola Normale Superiore Alumni and Collegio Universitario "Lamaro-Pozzani" Alumni.

## Science Outreach

A description of my outreach activities is present on the Outreach page of my personal website.

2022 **Op-Ed writer for Scientific American:** "Why Do Astronomers Seek the Most Distant Galaxies?".

2016–present **My scientific work and outreach activity have been featured on 72 different newspapers and magazines**, including CNN, ABC News, USA Today, Universe Today, Space.com, Harvard Gazette, Express, Cosmos, Focus, Sky and Telescope, la Repubblica, il Corriere della Sera, il Messaggero, la Stampa, la Voce di New York.

2019 **Guest for the CBS Interactive show hosted by Tonya Hall: What we know about the black hole information paradox** aired on Dec 23, 2019.

2019 **Writer of one essay for the "Libro dell'Anno 2019" by Treccani** about the EHT image of the black hole in M87. Treccani is among the most prestigious encyclopedic institutions in Europe.

2018 **Astronomy on Tap - New Haven:** I presented the talk "The Hunt for the First Black Holes in the Universe" to the popular venue of science outreach with an audience of about 300 people.

2013–present **Presented 153 outreach talks in various locations, both in person and virtual:** Italy (Rome, Venice, Pisa, Florence, Milan, Taranto, Bari), USA (New Haven, West Haven, Westport, Hartford, NYC, Cambridge, Boston), Netherlands (Amsterdam, Groningen).

2016–2017 **Multiple invitations as guest for the radio programme "Aula 40"** on air on Punto radio, Pisa (Italy) from the National Research Center (CNR).

2013–2016 **Organizer of the Cosmology outreach program** for the Scuola Normale Superiore, Italy.

2013–2017 **Organizer of the local astronomy outreach events** for the "Night of the Researchers" in Italy.

2016 **Scientific support for a NASA press release** on one of my first-authored papers.

2011 **Scientific Editor for the book "Cielo Tricolore":** this book celebrated the 150th anniversary of Italy and was sent to the President of the Italian Republic.

2005 **Author of a section of the book "Astronomia in rete: gli studenti fanno vedere le stelle"** published by the Italian Ministry of Education, University and Research. The section described a method to measure the distance of close-by astronomical objects, easily implementable in scholastic environments.

2004–2005 **Author of two peer-reviewed articles (listed on NASA-ADS) about didactic experiments in astronomy to be performed in schools:** titles are "La scala per le stelle: una sperimentazione scolastica per il calcolo della parallasse" and "Cielo amico: prime esperienze".

## Invited Visits

Jan–Mar 2016 **Yale University - Department of Astronomy**, *New Haven (CT)*, USA.
Supervisor: Prof. Priyamvada Natarajan, Research interest: Black hole outflows

Jan–Apr 2015 **Institut d'Astrophysique de Paris (IAP)**, *Paris*, France.
Supervisor: Prof. Marta Volonteri, Research interest: Black hole accretion and growth

Jul–Sept 2012 **Center for Astrophysics | Harvard & Smithsonian**, *Cambridge (MA)*, USA.
Supervisor: Prof. Lars Hernquist, Research interest: Planetary dynamics

## Computer & Language Skills

**Programming languages with substantial experience:** Python, C, C++, Fortran, MPI, Javascript
**Other programming languages:** IDL, MATLAB, Java
**Astrophysical/Cosmological simulation codes:** Enzo, Ramses, Pluto
**Astronomical data software:** Chandra tools (CIAO), IRAF, DS9, Keck DEIMOS tools
**Operating systems:** Mac OS X, Linux, MS Windows

**Productivity software:** TeX, LaTeX, MS Office, various video editing software
**Certifications:** ECDL (European Computer Driving Licence) obtained in December 2005
**Language skills:** Italian (mother tongue), English (Full Professional Proficiency, IELTS certificate - C2 level, 2011), French (Fluent, DELF certificate - B2 level, 2014), Spanish (Intermediate, B1)