

Fabio Pacucci

Curriculum Vitae & Publication List
Updated: April 21, 2024

Center for Astrophysics
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ORCID: 0000-0001-9879-7780
Nationality: U.S.A. and Italy

Employment & Education

- 2019–present **Clay Fellow**,
Smithsonian Astrophysical Observatory, Cambridge (MA), USA.
- 2019–present **BHI Fellow**,
Harvard University, Cambridge (MA), USA.
- 2019 **NOVA Fellow**,
Kapteyn Astronomical Institute, Netherlands.
- 2016–2018 **Postdoctoral Research Associate**,
Yale University – Department of Physics, New Haven (CT), USA.
- 2013–2016 **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

Awards and Scholarships

- 2019 **Clay Fellowship (SAO)**
- 2019 **BHI Fellowship (Harvard University)**
- 2017 **Livio Gratton Prize** – Best Ph.D. Thesis in Astronomy in Italy (2014-2016)
- 2017 **American Astronomical Society "International Travel Grant" Award**
- 2016 **IAU Ph.D. Prize** – International Astronomical Union prize for Ph.D. Thesis
- 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

Grants and Successful Telescope Proposals

Fellowships:

Name	Years	Award
Clay Fellowship	2022 – 2025	~ \$375,000
BHI Fellowship	2019 – 2022	~ \$360,000
NOVA Fellowship	2019	~ \$70,000

Awarded Telescope Proposals as Principal Investigator:

Telescope	Year	Type	Time	Target	Award
Chandra	2024	DDT	10 ks	Gaia BH3	TBD
JWST	2023	GO	12.38 hrs	Leo I dSph	\$88,455
Gemini-S (GMOS)	2023	DDT	6.5 hrs	Leo I dSph	N/A
VLA	2022	DDT	2 hrs	Leo I dSph	N/A
SMA	2022	DDT	6.7 hrs	Leo I dSph	N/A
VLA	2022	DDT	0.75 hr	Leo I dSph	N/A
Chandra	2022	DDT	30 ks	Leo I dSph	\$22,050
Chandra	2022	GO	250 ks	HD2	\$87,200
Keck (MOSFIRE)	2018	GO	2 nights	CR7	N/A
Chandra	2017	THEORY	N/A	N/A	\$87,000

Publication Record

Total number of scientific publications (papers, proceedings, funded proposals): 122

Total number of papers: 83

Total number of citations (Google Scholar): 3497

[Link to Personal ADS Library](#)

Number of first-author scientific publications: 48

H-index (Google Scholar): 34

m-index (Google Scholar): 3.4

Peer-Reviewed Publication List

Note: For co-authored papers, when more than 10 authors are present, only the first and the total number of authors are indicated. A star symbol (*) indicates undergraduate student-led papers for which I was the primary mentor.

1. **Pacucci F.**, Loeb A., Juodžbalis I., *The Host Galaxy of a Dormant, Overmassive Black Hole at $z = 6.7$ May Be Restarting Star Formation*, 2024, Research Notes of the AAS
2. **Pacucci F.**, *Distant Lights in the Darkness*, 2024, S&T, May 2024, page 20.
3. Seille, L. M., [...] **Pacucci F.**, et al., (18 authors) *Physical properties of strong $1 < z < 3$ Balmer and Paschen lines emitters observed with JWST*, 2024, submitted to A&A
4. Mezcua M., **Pacucci F.**, Suh H., Siudek M., Natarajan P., *Overmassive black holes at cosmic noon: linking the local and the high-redshift Universe*, 2024, accepted for publication on ApJ Letters
5. Kocevski, D. D., [...] **Pacucci F.**, et al., (57 authors) *The Rise of Faint, Red AGN at $z > 4$: A Sample of Little Red Dots in the JWST Extragalactic Legacy Fields*, 2024, submitted to ApJ
6. Calabrò, A., [...] **Pacucci F.**, et al., (30 authors) *The evolution of the SFR and Σ_{SFR} of galaxies in cosmic morning ($4 < z < 10$)*, 2024, submitted to A&A
7. **Pacucci F.** & Loeb A., *The Redshift Evolution of the $M_{\bullet} - M_{\star}$ Relation for JWST's Supermassive Black Holes at $z > 4$* , 2024, ApJ, Volume 964, Number 2
8. Cappelluti N., Foord A., Marchesi S., **Pacucci F.**, et al., (10 authors), *Surveying the onset and evolution of supermassive black holes at high- z with AXIS*, 2023, AXIS White Paper
9. **Pacucci F.**, Seepaul B., Ni Y., Cappelluti N., Foord A., *Detecting Wandering Intermediate-Mass Black Holes with AXIS in the Milky Way and Local Massive Galaxies*, 2023, AXIS White Paper

10. Foord A., Cappelluti N., Liu T., Volonteri M., Habouzit M., **Pacucci F.**, et al., (11 authors), *Tracking SMBH mergers from kpc to sub-pc scales with AXIS*, 2023, AXIS White Paper
11. Gallo E., Hodges-Kluck E., Treu T., Baldassare V., Seth A., Greene J., **Pacucci F.**, et al., (10 authors), *The black hole occupation fraction of local dwarf galaxies with AXIS*, 2023, AXIS White Paper
12. Reynolds C. S., [...] **Pacucci F.**, et al., (43 authors) *Overview of the Advanced X-ray Imaging Satellite (AXIS)*, 2023, Published in Proceedings of SPIE Optics & Photonics 2023, San Diego
13. Fragione G. & **Pacucci F.**, *Constraining the Properties of Black Hole Seeds from the Farthest Quasars*, 2023, ApJ Letters, Volume 958, Issue 2, id.L24, 6 pp.
14. **Pacucci F.**, Nguyen B., Carniani S., Maiolino R., Fan X., *JWST CEERS & JADES Active Galaxies at $z = 4 - 7$ Violate the Local $M_{\bullet} - M_{\star}$ Relation at $> 3\sigma$: Implications for Low-Mass Black Holes and Seeding Models*, 2023, ApJ Letters, Volume 957, Number 1
15. **Pacucci F.**, Ni Y., Loeb A., *Extreme Tidal Stripping May Explain the Overmassive Black Hole in Leo I: a Proof of Concept*, 2023, ApJ Letters, Volume 956, Issue 2, id.L37, 6 pp.
16. Nabizadeh A., Zackrisson E., **Pacucci F.**, et al., (34 authors), *A search for high-redshift direct collapse black hole candidates in the PEARLS north ecliptic pole field*, 2024, Astronomy & Astrophysics, Volume 683, id.A58, 9 pp.
17. Natarajan P., **Pacucci F.**, Ricarte A., Bogdan A., Goulding A. D., Cappelluti N. *First Detection of an Over-Massive Black Hole Galaxy: UHZ1 – Evidence for Heavy Black Hole Seeds From Direct Collapse?*, 2024, ApJ Letters, Volume 960, Issue 1, id.L1, 7 pp.
18. Han J. J., [...] **Pacucci F.**, et al., (209 authors), *NANCY: Next-generation All-sky Near-infrared Community survey*, 2023, Bulletin of the AAS
19. ★ Weller E. J., **Pacucci F.**, Natarajan, P., Di Matteo, T. *Over-massive Central Black Holes in the Cosmological Simulations ASTRID and Illustris TNG50*, 2023, MNRAS, Volume 522, Issue 4, pp.4963-4971
20. Jin X., [...] **Pacucci F.**, et al., (13 authors), *(Nearly) Model-Independent Constraints on the Neutral Hydrogen Fraction in the Intergalactic Medium at z 5-7 Using Dark Pixel Fractions in Ly-alpha and Ly-beta Forests*, 2023, ApJ, Volume 942, Number 59
21. **Pacucci F.** & Loeb A., *Accretion from Winds of Red Giant Branch Stars May Reveal the Super-massive Black Hole in Leo I*, 2022, ApJ Letters, Volume 940, Number 2
22. ★ Weller E. J., **Pacucci F.**, Ni Y., Chen N., Di Matteo T., Siwek, M., Hernquist L., *Orbital and Radiative Properties of Wandering Intermediate-Mass Black Holes in the ASTRID Simulation*, 2022, MNRAS, Volume 520, Issue 3, pp.3955-3963
23. Di Matteo T., Ni Y., Chen N., Croft R., Bird S., **Pacucci F.**, Ricarte A., Tremmel M., *A vast population of wandering and merging IMBHs at cosmic noon*, 2022, submitted to MNRAS, eprint arXiv:2210.14960
24. ★ Lee R. Z., **Pacucci F.**, Natarajan P., Loeb A. *The Two $z \sim 13$ Galaxy Candidates HD1 and HD2 Are Likely Not Lensed*, 2023, MNRAS, Volume 519, Issue 1, pp.585-593
25. ★ Seepaul B., **Pacucci F.**, Narayan R., *Detectability of Wandering Intermediate-Mass Black Holes in the Milky Way Galaxy from Radio to X-rays*, 2022, MNRAS, Volume 515, Issue 2, pp.2110-2120
26. Regan J. A., **Pacucci F.**, Bustamante-Rosell M. J., *Observational Signatures of Massive Black Hole Progenitor Pathways: is Leo I a Smoking Gun?*, 2023, MNRAS, Volume 518, Issue 4, pp.5997-6003
27. **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*, 2022, MNRAS, Volume 514, Issue 2, pp.2855-2863

28. **Pacucci F.**, Dayal P., Harikane Y., Inoue A. K., Loeb A., *Are the Newly-Discovered $z \approx 13$ Drop-out Sources Starburst Galaxies or Quasars?*, 2022, MNRAS Letters, Volume 514, Issue 1, pp.L6-L10
29. Koss M. J., [...] **Pacucci F.**, et al., (35 authors), *BASS. XXII. The BASS DR2 AGN Catalog and Data*, 2022, ApJ Supplement Series, Volume 261, Issue 1, id.2, 30 pp
30. Koss M. J., [...] **Pacucci F.**, et al., (27 authors), *BASS. XXI. The Data Release 2 Overview*, 2022, ApJ Supplement Series, Volume 261, Issue 1, id.1, 17 pp
31. LISA Cosmology WG, [...] **Pacucci F.**, et al., (180 authors), *Cosmology with the Laser Interferometer Space Antenna*, 2022, published in Living Reviews In Relativity, eprint arXiv:2204.05434
32. LISA Astrophysics WG, [...] **Pacucci F.**, et al., (155 authors), *Astrophysics with the Laser Interferometer Space Antenna*, 2022, published in Living Reviews In Relativity, eprint arXiv:2203.06016
33. ★ 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*, 2022, MNRAS, Volume 511, Issue 2, Pages 2229–2238
34. Harikane Y., [...] **Pacucci F.**, et al., (14 authors), *A Search for H-Dropout Lyman Break Galaxies at $z \approx 12-16$* , 2022, ApJ, Volume 929, Issue 1, id.1, 15 pp
35. **Pacucci F.** & Loeb A., *The Search for the Farthest Quasar: Consequences for Black Hole Growth and Seed Models*, 2022, MNRAS, Volume 509, Issue 2
36. Chen H., Ricarte A., **Pacucci F.**, *Prospects to Explore High-redshift Black Hole Formation with Multi-band Gravitational Waves Observatories*, 2022, submitted to ApJ Letters, eprint arXiv:2202.04764
37. **Pacucci F.**, Mezcua M., Regan J. A., *The Active Fraction of Massive Black Holes in Dwarf Galaxies*, 2021, ApJ, Volume 920, Issue 2, id.134, 12 pp
38. Outmezguine N. J., **Pacucci F.**, Loeb A., *Detection Prospects of Local Super-Massive Black Holes Based on the Sloan-Digital Sky Survey*, 2021, submitted to MNRAS, eprint arXiv:2108.10123
39. Vagnozzi S., **Pacucci F.**, Loeb A., *Implications for the Hubble tension from the ages of the oldest astrophysical objects*, 2022, Journal of High Energy Astrophysics, Volume 36, p. 27-35
40. Sesana A., [...] **Pacucci F.**, et al., (34 authors), *Unveiling the Gravitational Universe at μ -Hz Frequencies*, 2021, Experimental Astronomy, Volume 51, Issue 3, p.1333-1383
41. Unal C., **Pacucci F.**, Loeb A., *Properties of Ultralight Bosons from Heavy Quasar Spins via Superradiance*, 2021, JCAP, Volume 2021, Issue 05, id.007, 21 pp
42. Yang J., [...] **Pacucci F.**, et al., (12 authors), *Measurements of the $z \approx 6$ Intergalactic Medium Optical Depth and Transmission Spikes Using a New $z > 6.3$ Quasar Sample*, 2020, ApJ, Volume 904, Issue 1, id.26, 28 pp
43. Nunes R. C. & **Pacucci F.**, *Effects of the Hubble Parameter on the Cosmic Growth of the First Quasars*, 2020, MNRAS, Volume 496, Issue 1, pp.888-893
44. Whalen D. J., Surace M., Bernhardt C., Zackrisson E., **Pacucci F.**, Ziegler B., Hirschmann M., *Finding the First Quasars at Birth*, 2020, ApJ Letters, Volume 897, Issue 1, Article L16
45. **Pacucci F.** & Loeb A., *Separating Accretion and Mergers in the Cosmic Growth of Black Holes with X-ray and Gravitational Wave Observations*, 2020, ApJ, Volume 895, Issue 2, id.95, 8 pp
46. **Pacucci F.** & Loeb A., *Reality or Mirage? Observational Test and Implications for the Claimed Extremely Magnified Quasar at $z = 6.3$* , 2020, ApJ, Volume 889, Issue 1, id.52, 6 pp
47. Baer R. E., [...] **Pacucci F.**, et al., (21 authors), *BAT AGN Spectroscopic Survey – XIII. The nature of the most luminous obscured AGN in the low-redshift universe*, 2019, MNRAS, Volume 489, Issue 3, p.3073-3092
48. 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*,

- 2019, ApJ, Volume 883, Issue 1, article id. 64, 8 pp
49. Ricarte A., **Pacucci F.**, Natarajan P., Cappelluti N., *The Clustering of Undetected High-redshift Black Holes and Their Signatures in Cosmic Backgrounds*, 2019, MNRAS, Volume 489, Issue 1, p.1006-1022
 50. Haiman Z., **Pacucci F.**, et al., *Electromagnetic Window into the Dawn of Black Holes*, Astro2020, US Decadal Survey White Paper
 51. 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
 52. Fan X., **Pacucci F.**, et al., *The First Luminous Quasars and Their Host Galaxies*, Astro2020, US Decadal Survey White Paper
 53. **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
 54. Natarajan P., **Pacucci F.**, et al., *Disentangling nature from nurture: tracing the origin of seed black holes*, Astro2020, US Decadal Survey White Paper
 55. Nguyen D., [...] **Pacucci F.**, et al., (20 authors), *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*, 2019, ApJ, Volume 872, Issue 1, article id. 104, 26 pp
 56. **Pacucci F.** & Loeb A., *Most Lensed Quasars at $z > 6$ are Missed by Current Surveys*, 2019, ApJ Letters, Volume 870, Issue 2, Article L12
 57. Fan X., [...] **Pacucci F.**, et al., (20 authors), *The Discovery of a Gravitationally Lensed Quasar at $z = 6.51$* , 2019, ApJ Letters, Volume 870, Issue 2, article id. L11, 6 pp
 58. Shankar F., [...] **Pacucci F.**, et al., (12 authors), *Black hole scaling relations of active and quiescent galaxies: Addressing selection effects and constraining virial factors*, 2019, MNRAS, Volume 485, Issue 1, p.1278-1292
 59. Woods T. E., [...] **Pacucci F.**, et al., (33 authors), *Titans of the Early Universe: the Prato Statement on the Origin of the First Super-Massive Black Holes*, 2019, PASA review, Volume 36, id. e027
 60. **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, 6 pp
 61. **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
 62. 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
 63. Wang L., [...] **Pacucci F.** et al., (46 authors), *A First Transients Survey with JWST: the FLARE project*, 2017, arXiv:1710.07005
 64. **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
 65. **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
 66. Gallerani S., Fan X., Maiolino R., **Pacucci F.**, *Physical properties of the first quasars*, 2017, PASA review, Volume 34, id. e022, 19 pp
 67. 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

68. Yue B., Ferrara A., **Pacucci F.**, Omukai K., *Triggering the Formation of Direct Collapse Black Holes by their Congeners*, 2017, ApJ, Volume 838, Issue 2, article id. 111
69. Cappelluti N., [...] **Pacucci F.**, et al., (18 authors), *The Chandra COSMOS Legacy Survey: Energy Spectrum of the Cosmic X-Ray Background and Constraints on Undetected Populations*, 2017, ApJ, Volume 837, Issue 1, article id. 19, 8 pp
70. 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, 13 pp
71. **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
72. **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
73. 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, IAUS No. 319, 2015
74. Pallottini A., Ferrara A., **Pacucci F.**, Gallerani S., Salvadori S., Schneider R., Schaerer D., Sobral D., Matthee J., *The Brightest Ly α Emitter: Pop III or Black Hole?*, 2015, MNRAS, Volume 453, Issue 3, p. 2465-2470
75. **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
76. **Pacucci F.**, Volonteri M., Ferrara A., *The Growth Efficiency of High-Redshift Black Holes*, 2015, MNRAS, Volume 452, Issue 2, p. 1922-1933
77. **Pacucci F.**, Ferrara A., Marassi S., *Gravitational Waves from Direct Collapse Black Holes Formation*, 2015, MNRAS, Volume 449, Issue 1, p. 1076-1083
78. **Pacucci F.**, Ferrara A., *Simulating the Growth of Intermediate Mass Black Holes*, 2015, MNRAS, Volume 448, Issue 1, p. 104-118
79. Dayal P., Mesinger A., **Pacucci F.**, *Early Galaxy Formation in Warm Dark Matter Cosmologies*, 2015, ApJ, Volume 806, Issue 1, article id. 67, 10 pp
80. Dayal P., Ferrara A., Dunlop J., **Pacucci F.**, *Essential Physics of Early Galaxy Formation*, 2014, MNRAS, Volume 445, Issue 3, p. 2545-2557
81. **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
82. **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
83. **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

Professional Service and Collaborations

Peer-Review

- Referee: Nature, ApJ, ApJ Letters, MNRAS, MNRAS Letters, A&A (since 2015)
- Peer Reviewer: JWST TAC
- Peer Reviewer: NSF Division of Astronomical Sciences
- Peer Reviewer: NASA Astrophysics Division FINESST (various years)

- Peer Reviewer: AAS Chambliss award (various years)
- Peer Reviewer: NASA NICER GO (various years)

Memberships and Collaborations

- Member of the Steering Committee of the AGN Working Group for the NASA Habitable Worlds Observatory (2024 – present)
- Member of the JWST/CEERS Collaboration (2023 – present)
- Member of the AXIS X-ray Telescope Science Team (2023 – present)
- Member of the AAS Congressional Visit Group 2023 in Washington, DC
- Member of the Scientific Advisory Council of the ATA, Associazione Tuscolana di Astronomia (2023 – present)
- NASA's New Great Observatories Science Analysis Group (2023 – present)
- Associate Member of LISA Consortium (2018 – present)
- Junior Member of International Astronomical Union (2018 – present)
- Full Member of the American Astronomical Society (2016 – present)
- Member of the Center for Astrophysics Postdoc Committee (2020 – present)
- Member of the Postdoc Committee for the CfA Director's search (2021)
- Member of the IAU Executive Committee for Junior Members (2018 – 2019)
- Member of the New Haven Rotary Club (2017 – 2018)
- Member of Scuola Normale Superiore Alumni Association (2016 – present)
- Member of the Collegio Universitario "Lamaro-Pozzani" Alumni Association (2013 – present)
- Member of ISSNAF (Italian Scientists and Scholars in North America Foundation) (2012 – present)

Scientific Organizing Committees

- SOC Chair of the MIT/Harvard Meeting: "BABAM! Boston-Area Blackhole Accretion Meeting" (2023)
- Co-Organizer of the AAS 243 Meeting Special Session "International Students and Researchers in Astronomy: Issues and a Path Forward" (2023)
- SOC Chair of the Sexten Summer 2023 Conference "Under the Peaks: Constraining the Low-mass End of the Black Hole Occupation Fraction" (2022 – present)
- SOC Chair for the Annual BHI Conference (2020 – present)
- SOC Member for the CfA Colloquium Series (2020 – present)
- SOC Chair for the BHI Colloquium Series (2019 – present)
- SOC Member for the Conference "Accretion History of AGN", Miami (FL), USA (2019)
- Session Chair for the AAS 240th Meeting (2022)
- Session Chair for the AAS 236th Meeting (2020)

Experience as Research Advisor and Mentor

- 2024 – present Valentina La Torre, Graduate Student, Tufts University
- 2024 – present Umasree Thekkemadam, Graduate Student, University of Miami
- 2024 – present Jasmine Gill, Graduate Student, Harvard University
- 2024 – present Victoria DiTomasso, Graduate Student, Harvard University
- 2024 – present Truman Pauley, Undergraduate Student, Harvard University

- 2024 — present Emiliano Maldonado, Undergraduate Student, Harvard University
- 2024 — present Callie Garcia, Undergraduate Student, Harvard University
- 2024 — present Annika Geiersbach, Undergraduate Student (HCRP program winner), Harvard University
- 2024 — present Cal Guia, Undergraduate Student (HCRP program winner), Harvard University
- 2023 — present Fabiola Cocchiararo, Graduate Student, University of Milan-Bicocca
- 2023 — present Emmanuel Durodola, Graduate Student, Dartmouth College
- 2023 — present Bao (Tintin) Nguyen, Undergraduate Student, University of Arizona
 - 2023 Daria-Teodora Harabor, Undergraduate Student (HCRP program winner), Harvard University
 - 2023 Bruna Biz, Undergraduate Student (PRISE program winner), Harvard University
 - 2023 Aurora Abbondanza, Graduate Student, University of Rome — Sapienza
- 2022 — 2023 Sofia Martinez, Undergraduate Student (Senior Thesis), Harvard University
 - 2022 Bella Tarantino, Undergraduate Student, Harvard University
- 2022 — 2023 Rui Zhe Lee, Undergraduate Student, Harvard University
 - 2022 Rafid Quayum, Undergraduate Student (PRISE program winner), Harvard University
- 2021 — 2023 Bryan Seepaul, Undergraduate Student (PRISE program winner), Harvard University
- 2021 — present Emma Weller, Undergraduate Student (PRISE program winner), Harvard University
 - 2020 — 2022 Lucia Gordon, Undergraduate Student, Harvard University
 - 2020 — 2022 Sarah Gardner, High School Student, Ossining High School (NY)
 - 2021 Ray Fitzgerald, Undergraduate Student, Harvard University
 - 2021 Kaylie Hausknecht, Undergraduate Student, Harvard University
 - 2021 Emmanuel Durodola, Undergraduate Student, Banneker Institute Program at Harvard University and California State University
 - 2018 Qingyuan Qian, High School Student, Great Neck North High School (NY)

Teaching Experience

- 2024 **Teaching Assistant** for the Freshman Seminar classes in Spring 2024 at Harvard University (1 semester).
- 2023 **Guest Lecturer** for the course "Genesis of Stars And Life In The Universe" at Harvard University, for undergraduate students majoring in Astronomy (2 classes).
- 2020—2021 **Online Tutor** for an online tutoring company. I tutored tens of students to prepare for their math, physics, and astronomy classes and SAT/ACT tests.

- 2017 **Guest Lecturer** for the course "Gravity, Astrophysics, and Cosmology" at Yale University for undergraduate students majoring in Astronomy (2 classes).
- 2013 – 2015 **Teaching Assistant** for several undergraduate courses (SNS, Italy): classical mechanics, electromagnetism, general relativity, linear algebra.
- 2015 **Teaching Assistant** for the graduate course "Structure Formation in the Early Universe" (SNS, Italy).

Seminars and Colloquia

Review and Prize Talks

- Dec 2023 **Review Talk, "Intermediate-Mass Black Holes: The Dawn of a Revolutionary Era" Conference, Belize**
INTERMEDIATE-MASS BLACK HOLE SEEDS
- Sept 2023 **Review Talk, ITC Discussion, Center for Astrophysics | Harvard & Smithsonian, Cambridge (MA), USA**
OVERMASSIVE BLACK HOLES IN DWARF GALAXIES: THE STRANGE CASE OF LEO I
- Aug 2023 **Talk, Copenhagen Developers Festival, Copenhagen, Denmark**
SPACE AWE
- Apr 2023 **Clay Lecture, Center for Astrophysics, Cambridge (MA), USA**
SEARCHING FOR BLACK HOLES FROM THE NEARBY TO THE FARAWAY UNIVERSE
- Aug 2022 **PAX-22 Workshop, MIT, Cambridge (MA), USA**
OBSERVATIONAL SIGNATURES OF THE FIRST BLACK HOLES
- Jun 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
- Jun 2021 **Aspen Center for Physics, 2021 Summer Program, Aspen (CO), USA**
BLACK HOLE FORMATION AND GROWTH IN THE HIGH REDSHIFT UNIVERSE
- Aug 2018 **IAU General Assembly, Vienna, Austria**
IAU PH.D. PRIZE TALK: THE FIRST BLACK HOLES IN THE COSMIC DARK AGES
- Jul 2018 **The Early Growth of Supermassive Black Holes, Sexten, Italy**
A MULTI-WAVELENGTH VIEW ONTO THE FIRST BLACK HOLE SEEDS
- Nov 2017 **Workshop: "Titans of the Early Universe", Prato, Italy**
THE GROWTH OF THE FIRST BLACK HOLES

Invited Talks

- Apr 2024 Talk, NASA Habitable World Observatory AGN Working Group, virtual
- Mar 2024 Astrophysics Colloquium, UCLA, Los Angeles (CA), USA
- Nov 2023 Tufts Astro Colloquium, Tufts University, Medford (MA), USA
- Oct 2023 ASD Colloquium, NASA Goddard Space Flight Center, Greenbelt (MD), USA
- June 2023 Colloquium, Scuola Normale Superiore, Pisa, Italy
- June 2023 Talk, ATA Frascati, Rome, Italy

May 2023 Talk, MIT, Erin Kara's Group Meeting, Cambridge (MA), USA
 Apr 2023 Colloquium, KITP Stanford, Stanford (CA), USA
 Mar 2023 Special Session talk, AAS HEAD 20, Waikoloa Village (HI), USA
 Dec 2022 Talk, ITC Luncheon, Center for Astrophysics | Harvard & Smithsonian, Cambridge (MA), USA
 Nov 2022 Talk, Theory Seminar Series, CIERA, Northwestern University, Evanston (IL), USA
 Aug 2022 Colloquium, University of Miami, Miami (FL), USA
 Aug 2022 Talk, AXIS Seminar Series, virtual
 Jun 2022 Talk, AXIS Working Group Meeting, virtual
 May 2022 Speaker at the "The Night of Ideas", Boston (MA), USA
 Mar 2022 Special Session talk, AAS HEAD 19, Pittsburgh (VA), USA
 Nov 2021 Talk, UConn, Storrs (CT), USA
 Oct 2021 Talk, Institute for Advanced Studies, Princeton (NJ), USA
 Sept 2021 Speaker at the "Futurological Congress", Bolzano, Italy
 Sept 2021 Colloquium, INAF Brera, Milan, Italy
 Nov 2020 Colloquium, SISSA, Trieste, Italy
 Oct 2020 AAS HEAD division talk, virtual
 Oct 2020 HEAD Talk, Center for Astrophysics | Harvard & Smithsonian, Cambridge (MA), USA
 Sept 2020 Colloquium, NRC Herzberg Astronomy & Astrophysics, virtual
 Sept 2020 Colloquium, University of British Columbia, virtual
 Sept 2020 Talk, "Origin, growth, and feedback of black holes in dwarf galaxies", virtual conference
 Jun 2020 Press conference and Science talk, AAS 236th meeting, virtual
 Jan 2020 Colloquium, ITC, Harvard University, Cambridge (MA), USA
 Oct 2019 Talk, AHA Workshop, University of Miami, Miami (FL), USA
 Mar 2019 Colloquium, University of Connecticut, Storrs, (CT), USA
 Mar 2019 Colloquium, Black Hole Initiative (Harvard University), Cambridge (MA), USA
 Mar 2019 HEAD Talk, Center for Astrophysics | Harvard & Smithsonian, Cambridge (MA), USA
 Nov 2018 Talk, ITC, Center for Astrophysics | Harvard & Smithsonian, Cambridge (MA), USA
 Oct 2018 Colloquium, Dartmouth College, Hanover (NH), USA
 Mar 2018 Physics Colloquium, University of Miami, Miami (FL), USA
 Mar 2018 CosmoClub Talk, UC Santa Cruz, Santa Cruz (CA), USA
 Oct 2017 Colloquium, Yale Astronomy Department, New Haven (CT), USA

- Oct 2017 Colloquium, INAF - OAR, Astronomical Observatory of Rome, Italy
- Aug 2017 Talk, HEAD Meeting 2017, Sun Valley (ID), USA
- Jun 2017 Talk, Yale Society of Physics Student, New Haven (CT), USA
- Jun 2017 Talk, Elusive AGN in the Next Era, George Mason University, Fairfax (VA), USA
- Mar 2017 Talk, Science with the Hubble and James Webb Space Telescopes, Venice, Italy
- Dec 2016 Colloquium, The First Black Holes, CCA (Simons Foundation), NYC (NY), USA
- Jul 2016 Colloquium, Kapteyn Astronomical Institute, Groningen, The Netherlands
- Mar 2016 Talk, Columbia University, NYC (NY), USA
- Feb 2016 Talk, Yale University, New Haven (CT), USA
- Feb 2016 Talk, ITC, Center for Astrophysics | Harvard & Smithsonian, Cambridge (MA), USA
- Jan 2016 Colloquium MPA Garching, Germany
- Oct 2015 Talk, X DAVID International Workshop, Scuola Normale Superiore, Italy
- Feb 2015 Talk, IAP Paris, France
- Oct 2014 Talk, IX DAVID International Workshop, Scuola Normale Superiore, Italy
- Oct 2013 Talk, VIII DAVID International Workshop, Scuola Normale Superiore, Italy

Contributed Talks

- Apr 2024 Talk, "Massive Black Holes in the First Billion Years" Conference, Kinsale, Ireland
- Jan 2024 Talk, AAS 243, New Orleans (LA), USA
- Dec 2023 Talk, "Accretion History of AGN (AHA)" Conference, Miami (FL), USA
- Nov 2023 Talk, ITC Luncheon, Center for Astrophysics | Harvard & Smithsonian, Cambridge (MA), USA
- Nov 2023 Talk, Hernquist Group, Center for Astrophysics | Harvard & Smithsonian, Cambridge (MA), USA
- Sept 2023 Talk, "The First Year of JWST Science Conference", Baltimore (MD), USA
- Jun 2023 Talk, AAS 242, Albuquerque (NM), USA
- May 2023 Talk, NERQUAM Conference 2023, Kingston (RI), USA
- Mar 2023 Talk, eXtreme Black Holes, Aspen Winter Workshop, Aspen (CO), USA
- Sept 2022 Talk, VLA Sky Survey in the Multiwavelength Spotlight, Socorro (NM), USA
- Jun 2022 Talk, AAS Summer Meeting 2022, Pasadena (CA), USA
- May 2022 Talk, "IMBH: New Science from Stellar Evolution to Cosmology" workshop, Puerto Rico, USA
- Dec 2021 Talk, BLAST Workshop 2021, virtual
- Jan 2019 Talk, AAS Winter Meeting 2019, Seattle (WA), USA
- Mar 2018 Talk, AAS HEAD Meeting 2018, Rosemont (IL), USA

- Jun 2015 Talk, EWASS 2015 Conference, Spain
- Sept 2014 Talk, Meeting of the Italian Physical Society, Italy
- Jun 2014 Talk, Chalonge Meudon Workshop 2014 - Meudon Observatory, France

Diversity, Equity and Inclusion Initiatives

- 2024 - present Member of the Working Group of the AAS on International Students and Scholars
- 2024 - present Participant as mentor in the pilot edition of the “Mentoring Constellation” program at the CfA to provide support and guidance for young scientists.
- 2023 – 2024 Co-Organizer of the AAS 243 Meeting Special Session “International Students and Researchers in Astronomy: Issues and a Path Forward”
- 2023 – present Early Career Researcher representative for the “IDEAS, Education and Public Engagement” committee of the CfA 10-year Strategic Plan.
- 2023 – present Member of the CfA Early Career Workshop Committee.
- 2021 – present Original promoter and co-organizer of the "Distratis Scholarship", in memory of Cosimo Distratis – teacher, amateur scientist, and long-time supporter of science education. The scholarship funds the study of undergraduate students in Physics from underprivileged rural communities in the south of Italy.
 - 2021 Attended "Intensive Science Undergraduate Mentoring Workshop at Harvard Faculty of Arts and Science" with a particular focus on promoting DEI practices in mentoring activities.
 - 2021 Mentor for the Banneker Institute program at Harvard, which prepares undergraduate BIPOC students for graduate programs in astronomy, focusing on research, graduate coursework, and social science education.
- 2018 – present Mentored a very diverse cohort of students at the high school and undergraduate levels.

Public Outreach

Additional details and links about my outreach activities can be found on the [Outreach](#) page of my professional website.

- 2022 – present **Regular science writer for Scientific American.** "Why Do Astronomers Seek the Most Distant Galaxies?" [op-ed](#); "How Taking Pictures of Nothing Changes Astronomy" [op-ed](#) also published in the December 2022 printed edition of Sci Am; "Invisible Numbers Are the Most Beautiful Part of Every ‘Space’ Image" [op-ed](#); "JWST’s Smashing Success Shifts Focus to Astronomy’s Blind Spots" [op-ed](#); "JWST Finds Strange Harmony in Early Galaxies and Black Holes" [op-ed](#).

- 2018–present **Educator for 10 TED-Ed videos about science, many of them related to black holes.** For each video, I directed a team of ~ 10 people (animators, scriptwriters, narrators). Each video was viewed $\sim 200,000$ times on publication day, many of which have been translated into 25+ languages. Overall, the 10 published videos have 15+ million views. This effort was covered by an article on the [Harvard Gazette](#).
- 2023 **Science Editor for the book "Black Hole Aesthetics"**, by Lynn Gamwell
- 2022 **Guest for the podcast "Masters of Scale"** with Reid Hoffman, aired December 6, 2022.
- 2022 **Writer contributor** for the book "Shaping the Future: Sustainability and Technology at the Crossroads of Arts and Science", published by Graffeg (2023).
- 2021–2022 **Science Advisor** for the [Black Hole Symphony](#) show, produced by the Boston Museum of Science.
- 2019–present **Manager of public outreach activities** for the Black Hole Initiative at Harvard University. I manage social media pages and organize special outreach events (e.g., the [Quantum Supremacy](#) public lecture by Dr. Scott Aaronson in 2020).
- 2018 – present **Development of the [Black Hole Calculator](#):** online tool that provides a convenient summary of the properties of a black hole given its mass and spin. The calculator is a valuable tool for research and teaching, and it is used by a daily average of ~ 100 people worldwide.
- 2019 **Guest for a CBS show:** What we know about the black hole information paradox.
- 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 worldwide.
- 2018 **Astronomy on Tap – New Haven** with the talk "The Hunt for the First Black Holes in the Universe".
- 2016–2017 **Multiple invitations as a guest for the radio program "Aula 40"** on air from the National Research Center (CNR) in Pisa.
- 2013–2016 **Organizer of the Cosmology outreach program** for the Scuola Normale Superiore, Italy.
- 2013–2017 **Co-organizer of the local astronomy outreach events** for the "Night of the Researchers" in Italy.
- 2011 **Science 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–present **Presented ~ 100 public outreach talks**, both in person (Italy, USA, Netherlands, Peru, Spain) and virtual.

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

Press Coverage

Additional details and links about the press coverage of my research can be found on the [Press Coverage](#) page of my professional website.

- January 2024 **Extensive coverage of the discovery that black holes detected by JWST in the faraway Universe are significantly overmassive.** Among many others, it was covered by the [Sky & Telescope](#), [Big Think](#), and [phys.org](#). See also the beautiful [animation](#) created for the press release.
- April 2022 **Extensive coverage of the discovery of the most distant galaxy candidates ever found and their physical interpretation.** According to an analysis by the CfA press office, the news reached 1.5 billion readers worldwide. Among many others, it was covered by the [New York Times](#), [Reuters](#), [Boston Globe](#).
- June 2020 **Coverage of a new model to describe how black holes grow across cosmic time**, which was presented at a press conference during the 236th meeting of the AAS. The news was covered by [Sky & Telescope](#), [Phys.org](#), [Universe Today](#), [IFLScience](#) magazine, [Cosmos Magazine](#), [Repubblica](#), and [Media INAF](#).
- January 2019 **Coverage of the discovery of the first strongly lensed quasar at $z > 6$, for which I was a collaborator, along with its physical interpretation and consequences for the broader populations of high- z quasars.** The news was covered by Yale University, Keck Observatory, Hubble Space Telescope, and ESA press releases. Media outlets, such as [USA Today](#), [Space.com](#), [Astronomy.com](#), [Discover](#) magazine, [Science Daily](#), [Sky & Telescope](#), [Cosmos Magazine](#), [WSHU Public Radio](#), [Sci-News](#), [ScienMag](#), [EarthSky](#), [Repubblica](#) and [Messaggero](#), among many other outlets.
- May 2016 **Extensive coverage of the discovery of the first Direct Collapse Black Hole candidates.** The discovery was presented by a [NASA press release](#) and featured on [ABC News](#), [Daily Mail](#), [WIRED](#), [Space.com](#), [CBS](#), [ESA](#), [Chandra website](#), [Repubblica](#), [Corriere della Sera](#), [Messaggero](#), among many other outlets.
- 2016 – present **Routinely interviewed by media outlets to comment on recent discoveries in astronomy**, mostly regarding black holes. Examples of recent interviews: [Discover Magazine](#), [Yale Daily News](#), [Pop Sci](#), [Zeppelin](#), [Repubblica](#).

Long-Term Visits

- Jan–Mar 2016 **Yale University – Department of Astronomy, New Haven (CT), USA.**
SUPERVISOR: Prof. Priyamvada Natarajan, RESEARCH TOPIC: Black hole outflows
- Jan–Apr 2015 **Institut d’Astrophysique de Paris (IAP), Paris, France.**
SUPERVISOR: Prof. Marta Volonteri, RESEARCH TOPIC: Black hole seeds growth
- Jul–Sept 2012 **Center for Astrophysics | Harvard & Smithsonian, Cambridge (MA), USA.**
SUPERVISOR: Prof. Lars Hernquist, RESEARCH TOPIC: Planetary dynamics

Academic References

- Professor Abraham Loeb, Harvard University (aloeb@cfa.harvard.edu)
- Professor Tiziana Di Matteo, Carnegie Mellon University (tiziana@phys.cmu.edu)
- Professor Lars Hernquist, Harvard University (lhernquist@cfa.harvard.edu)
- Professor Ramesh Narayan, Harvard University (rnarayan@cfa.harvard.edu)
- Professor Xiaohui Fan, University of Arizona (xfan@email.arizona.edu)
- Professor Nico Cappelluti, University of Miami (ncappelluti@miami.edu)
- Professor Andrea Ferrara, Scuola Normale Superiore (andrea.ferrara@sns.it)
- Professor Andrei Mesinger, Scuola Normale Superiore (andrei.mesinger@sns.it)