

CURRICULUM VITAE

Abraham Loeb

Field of Research: Theoretical Astrophysics and Cosmology

Family: Married to Dr. Ofrit Liviatan and father to daughters Klil and Lotem

Work Address:

Harvard University

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Academic Degrees

1986 Ph.D. in Physics

1985 M.Sc. in Physics

1983 B.Sc. in Physics and Mathematics

The Hebrew University of Jerusalem, Israel

Thesis Titles

Ph.D. “Particle Acceleration to High Energies and Amplification of Coherent Radiation by Electromagnetic Interactions in Plasmas”

M.Sc. “Analytical Models for the Evolution of Strong Shock Waves Generated by High Irradiance Lasers in Solids and Fast Spark Discharges”

Positions Held

2021– Member of the *Center for Astrophysics Executive Board*.

2018–2021 Chair of the *Board on Physics & Astronomy* of the National Academies, USA.

2016-2018 Vice chair of the *Board on Physics & Astronomy* of the National Academies, USA.

2016 Founding Director of the *Black Hole Initiative*, Harvard University.

2016– Chair of the Advisory Committee for *Breakthrough Starshot*, Breakthrough Prize Foundation.

2015– Affiliate of the Center of Mathematical Sciences and Applications, Harvard University.

2015– Science Theory Director for the *Breakthrough Initiatives Projects* of the *Breakthrough Prize Foundation*.
2012– *Frank B. Baird Jr. Professor of Science*, Harvard University.
2011– Chair, Harvard Astronomy department (<http://astronomy.fas.harvard.edu/>).
2011– Sackler Senior Visiting Professor, School of Physics and Astronomy, Tel Aviv University.
2007– Director, *Institute for Theory and Computation (ITC)*, Harvard University (<http://www.cfa.harvard.edu/itc/>).
1997– Professor of Astronomy, Harvard University.
1995–1996 Associate Professor, Astronomy Dept., Harvard University.
1993–1995 Assistant Professor, Astronomy Dept., Harvard University.
1988–1993 Long-term member, The Institute for Advanced Study, Princeton.
1985–1988 Head of a theoretical group on electromagnetic propulsion, Israel.
1980–1988 Participant in “Talpiyot project,” Israel. This national project selects 25 high-school graduates every year from all around Israel; the participants attend an advanced program of academic study and research.

Honors & Awards

2021 “Extraterrestrial” selected as Best Science Book of the Year and Best Nonfiction Book of the Year, Amazon
2021 Keynote Speaker in Peace BAR (spiritually Beautiful, materially Affluent and humanly Rewarding) Festival, on the topic: “The Arrival of Extraterrestrial Intelligence in the Solar System: Will the Identity and Destiny of Earth be Rewritten“, Kyung Hee University System, South Korea
2021 Ignatius Speaker, on “Our Future in Space”, Washington National Cathedral
2021 Keynote Speaker, National Book Festival, Library of Congress
2021 New York Times Bestseller on first week after publication date of the book *Extraterrestrial*.
2015-2020 Three of Loeb’s students selected for “*Forbes 30 Under 30*” in five years: Amir Siraj, Henry Lin and Tony Pan; Forbes Magazine.
2020 *Dean’s Competitive Funds for Promising Scholarship*, Faculty of Arts & Sciences, Harvard University.
2020 Loeb’s PhD student, Nick Stone, awarded the *Bok Prize*, Astronomy Department, Harvard University.

2020 *Hoopes Prize in undergraduate education* for Senior Thesis of advisee, Amir Siraj, Harvard College.
2020 Member of the “President’s Council of Advisors on Science and Technology (PCAST), White House, USA.
2020 Member of the Advisory Board of “Einstein: Visualize the Impossible”, Hebrew University of Jerusalem, Israel.
2020 Selected to “The 14 Most Inspiring Israelis of the 2010-2020 Decade” by the organization “*From the Grapevine*”.
2019 Svein Rosseland Lecturer at the University of Oslo, Norway.
2018 *Hoopes Prize in undergraduate education* for Senior Thesis of advisee, Eden Girma, Harvard College.
2018 Selected among “100 Hebrew University Alumni We Love”, by the American Friends of the Hebrew University, Jerusalem.
2018 Distinguished Lecturer of the Center for Relativistic Astrophysics, School of Physics, Georgia Tech University, Atlanta.
2015 Elected Fellow of the International Academy of Astronautics (IAA) SETI Permanent Committee.
2015 Elected Member of the American Physical Society (APS).
2015 Member of the International Astronomical Union (IAU).
2014 Member of the Board on Physics & Astronomy (BPA) of the National Academies.
2013 Miegunyah Distinguished Visiting Fellowship, University of Melbourne, Australia.
2012 *Hoopes Prize in undergraduate education* for Senior Thesis of advisee, Marion Dierickx, Harvard College.
2012 Selected to “The 25 Most Influential People in Space” by TIME Magazine.
2012 Elected member of the American Academy of Arts & Sciences.
2012 Galileo Galilei Chair (Cattedra Galileiana) Award, Scuola Normale Superiore, Pisa, Italy.
2011 Sackler Lecturer in Astronomy, Leiden Observatory, Netherlands.
2011 Las Cumbres Observatory Prize Lecturer in Astrophysics, UC Santa Barbara.
2009/10 Director of the Jerusalem Winter School in Theoretical Physics.
2009 Distinguished Visiting Scientist at the Carnegie Observatories, Pasadena.
2008 Invited speaker at the annual symposium of the Miller Institute, UC Berkeley.
2007 Inaugural Australian Institute of Physics (AIP) End of Year Lecturer.

2007/8 Australia-Harvard Distinguished Fellow
2007 Merle Kingsley Distinguished Visitor at the California Institute of Technology (Caltech).
2006/7 John Bahcall Lecturer at Tel Aviv University University.
2006 Salpeter Lecturer at Cornell University.
2006 SAAS-Fee Lecturer on “The First Light”. Ten lectures summarized in a review of 158 pages, appeared in a book format (astro-ph/0603360).
2004- Distinguished Visiting Professorship at the Faculty of Physics and the Einstein Center for Theoretical Physics, Weizmann Institute of Science.
2003 Einstein Minerva fellow, Physics Faculty, Weizmann Institute.
2002 John Simon Guggenheim Memorial Foundation Fellow.
2001 Prof. Dror Sadeh Memorial Lecturer at Tel Aviv University.
1999 Bergmann Memorial Award of the US-Israel Binational Science Foundation.
1996 *Hoopes Prize in undergraduate education* for Senior Thesis of advisee P. Young, Harvard College.
1987 The Kennedy Prize, Hebrew University of Jerusalem.
1985 “Best M.Sc. Student” award of the Faculty of Science of the Hebrew University of Jerusalem (summa cum laude).
1980 Participant in the national elite project “Talpiyot”, Israel.

Mentoring Awards

2015 *Eric Keto Prize in Theoretical Astrophysics* for PhD thesis of advisee Gongjie Li. **2012** *Eric Keto Prize in Theoretical Astrophysics* for PhD thesis of advisee Laura Blecha.
2006 Robert J. Trumpler Award of the *Astronomical Society of the Pacific* for the PhD thesis to advisee Steven Furlanetto.

Honors in Public Outreach

2014 Profiled in the New York Times Science Section by Claudia Dreifus on December 1, 2014.
2014 Profiled in DISCOVER Magazine by Steve Nadis on April 2014.
2014 Research featured on NPR Radio and Fox News TV.
2013 Profiled in Science Magazine by Rob Irion on April 2013.
2013 Chambliss Astronomical Writing Award from the American Astronomical Society, for the book “How Did the First Stars and Galaxies Form?” (2010).
2011-2015 Ten articles featured in TIME Magazine by Mike Lemonick about

personal research papers.

2008 Cover story of Smithsonian magazine about black holes, and cover story of ASTRONOMY magazine about the future collision between the Milky-Way and Andromeda.

2007 Paper on *Milkomeda* (arXiv:0705.1170) was selected as one of the top 10 space stories by ASTRONOMY magazine.

Professional Service

2018- Ex-officio Member, U.S. Liaison Committee for the International Union of Pure and Applied Physics, National Academies.

2018 Member of the Consultation Group of the 2020 Decadal Survey in Astronomy and Astrophysics, National Academies.

2017- Ex-officio Member, U.S. National Committee for the International Astronomical Union.

2016- Member, President's Task Force on Diversity and Belonging, Harvard University.

2014- Member, Board on Physics and Astronomy of the National Academies.

2014-2017 Member, Dean's Faculty Resources Committee, Faculty of Arts & Sciences, Harvard University.

2014 Guest member, Editorial board, Annual Reviews of Astronomy & Astrophysics.

2013-2014 Physical Sciences Chair, Review Committee of Science Graduate Programs, Harvard University.

2013- Member, Allston Academic Planning Committee, Harvard University.

2013-2015 Member, Star Family Challenge Committee, Harvard University.

2011- Head of Astrophysics, Editorial Board, Scientific Reports, Nature Magazine.

2011-2014 Member, International Advisory Board, Publications of the Astronomical Society of Australia.

2009- Editor, Journal of Cosmology and Astroparticle Physics (JCAP).

2008-2010 Executive board for the *Energetic X-ray Imaging Survey Telescope*

2008-2010 Science Working Group for the *JANUS GRB Mission*

2008- Science Working Group for the *Lunar Radio Observatory*.

2008/9 Chair, selection committee of the Dan David Prize in cosmology.
2005–2008 Science Working Group for the *Cosmic Inflation Probe*.
2005– Science Working Group for the *Murchison Wide-Field Array*.
2000– Chair of the biennial *Harvard-Smithsonian Conference Series in Theoretical Astrophysics*, sponsored by Raymond and Beverly Sackler. The first conference on “The First Generation of Cosmic Structures” was held in May 2000 (<http://cfa-www.harvard.edu/apconf/>). The second conference on “Gamma-Ray Bursts: The Brightest Explosions in the Universe” was held in May 2002 (<http://cfa-www.harvard.edu/grbconf/>). The third conference on “Astrophysics of Planetary Systems” was held in May 2004 (<http://cfa-www.harvard.edu/apsconf/>). The fourth conference on “Nuclear Black Holes in Galaxies” was held in May 2006 (<http://cfa-www.harvard.edu/bh2006/>). The fifth conference on “21cm Cosmology” was held in May 2008 (<http://www.cfa.harvard.edu/events/2008/cos2008/>). The sixth conference on “Dynamics from the Galactic Center to the Milky-Way Halo” was held in May 2010 (<http://www.cfa.harvard.edu/events/2010/dyn/>). The seventh conference on “Testing General Relativity with Astrophysical Systems” was held in May 2012 (<http://www.cfa.harvard.edu/events/2012/sackler>). The eighth conference on “Debates of the Nature of Dark Matter” was held in May 2014 (<http://www.cfa.harvard.edu/events/2014/sackler>). The ninth conference on “The Transient Sky” was held in May 2016 (<http://www.cfa.harvard.edu/events/2016/sackler>). The tenth conference on “Gravitational Wave Astrophysics” was held in May 2018 (<https://itc.cfa.harvard.edu/sackler-conference-2018>).
1999–2000 Panel on Ultraviolet, Optical, and Infrared Astronomy from Space of the Astronomy and Astrophysics Survey Committee.
1998–2000 Science Working Group for the *Generation-X Space Telescope*.
1997–2000 Science Working Group for the *Next Generation Space Telescope*.

Undergraduate Students at Harvard College

Peter Young, Genevieve Shattow, Marion Dierickx, Ana-Maria Constantin, Henry Lin, Eden Girma, Amir Siraj, Mahlet Shiferaw.

Graduate Students (in chronological order)

Daniel Eisenstein (Hubble fellow, Professor at Univ. of Arizona, now tenured Professor at Harvard Univ.), Zoltán Haiman (Hubble fellow, tenured Professor at Columbia Univ.), Rosalba Perna (Harvard Junior fellow, Princeton Spitzer fellow, tenured Professor at SUNY Stony Brook), Eric Woods (teaching), Ravi Pilla (graduated), Alexandre Refregier (Professor, ETH Zurich, Switzerland), David Heyrovsky (graduated), Xiaohu Wang (graduated), Pinaki Chatterjee (graduated), Steven Furlanetto (prize postdoctoral fellowship at Caltech, tenured Professor at UCLA, Loren Hoffman (Lindheimer postdoctoral fellow, Northwestern, postdoc at Hebrew University), Daniel Babich (prize postdoctoral fellowship, Caltech), Ryan O’Leary (Einstein fellow, UC Berkeley), Genevieve Shattow (Swinburne), Joseph Munoz (researcher, Lincoln Labs), Bence Kocsis (Einstein fellow, ITC, postdoc IAS, Professor in Hungary), Laura Blecha (Einstein fellow, Maryland; Assistant Professor, U. Florida), Idan Ginsburg (Dartmouth, research fellow at CfA), Eli Visbal (Prize postdoc at Columbia U., Research Fellow at Flatiron Institute, Professor at Univ. of Toledo), Nicholas Stone (Postdoc at Columbia U., Assistant Professor at Hebrew University), Douglas Rubin (graduated, finances), Tony Pan (graduated, CEO of “Modern Electron”), Jonathan Bitner (Physics, CEO of startup), Gongjie Li (Harvard Junior fellow, Assistant Professor at Georgia Tech), Natalie Mashian (Physics, research fellow in biophysics), Marion Dierickx (Astronomy, postdoc at Harvard), Pierre Christian (Astronomy, prize postdoc in Arizone), Anna Ijjas (Visiting PhD student), Anna Patej (Physics, Prize postdoc at U. Arizona), Xiawei Wang (Astronomy), Ben Margalit (Columbia U., postdoc at UC Berkeley), Aaron Smith (UT Austin), Delilah Gates (Physics), Sophia Sanchez-Maes (Astronomy), Betty Hu (Physics), Shelley Cheng (Astronomy), Karina Mathew (English).

Visiting Graduate Students (in chronological order)

Dr. Girish Kulkarni (India), Dr. Urbano Franca (Spain), Dr. Kimi Hayasaki (Japan), Dr. Francisco Villaescusa-Navarro (Spain), Dr. Giacomo Fragione (Italy), Dr. Shmuel Bialy (Israel), Dr. Akshaya Rane (WVU, US), Dr. Erez Michaeli (Israel), Elisa Tabor (Stanford).

Postdoctoral fellows (in chronological order)

Anne Thoul (Prof. at Univ. of Liege, Belgium), Volker Bromm (Prof. at

Univ. of Texas), Stuart Wytthe (Prof. at Univ. of Melbourne), Avery Broderick (Prof. at Univ. Waterloo, Canada), Misha Medvedev (Prof. at U. Kansas), Mark Dijkstra (MPA postdoc), Scott Gaudi (Prof. at Ohio-State U.), Jonathan Pritchard (Prof. at Imperial College, UK), Uri Keshet (Prof. at Ben Gurion Univ., Israel), Yuval Birnboim (Prof. at Hebrew Univ.), Bence Kocsis (Einstein fellow), Charlie Conroy (Prof. at Harvard), Yue Shen (Prof. at U. Illinois), Nico Yunes (Prof. at Univ. of Montana), Asaf Pe'er (Prof. at Cork Univ., Ireland), Smadar Naoz (Prof. at UCLA), Sayan Chakraborti (Harvard Society of Fellows), Konstantin Batygin (Prof. at Caltech), Yan-Fei Jiang (Einstein fellow), Lorenzo Sironi (Einstein fellow), James Guillochon (Einstein fellow), Cora Dvorkin (Hubble fellow), Igor Pikovski (Branco Weiss postdoctoral fellow), Blakesley Burkhardt (Einstein fellow), Nia Imara (Future Faculty Leader fellow, Harvard), Zac Manchester (SEAS postdoctoral fellow, Harvard), Girish Kulkarni (Cambridge U.), Nicola Amorisco (ITC fellow), Anastasia Fialkov (ITC fellow), John Forbes (ITC fellow), Ana Bonaca (ITC fellow), Laura Kreiberg (Harvard Junior Fellow), Nia Imara (John Harvard fellow), Dan D'Orazio (ITC fellow), Sownak Bose (ITC fellow), Manasvi Lingam (ITC fellow), Razi Emami (ITC fellow), Paul Chesler (BHI fellow), Hsin-Yu Chen (BHI fellow), Feraz Azhar (BHI fellow), Vokram Ravi (CfA fellow), Julian Munoz (CfA fellow), Mohammad Safarzadeh (ITC fellow), Karan Jani (Vanderbilt), Richard Annantua (ITC fellow), Morgan MacLeod (ITC fellow).

Abraham Loeb - LIST OF PUBLICATIONS

Books

8. Lingam, M., & Loeb, A. “*Life In The Cosmos: From Biosignatures to Technosignatures*”, Harvard University Press (June 2021).
7. Loeb, A. “*Extraterrestrial*”, Houghton Mifflin Harcourt (January 2021).
6. Loeb, A. (Eds. D. Sloan, R.A. Batista, M. T. Hicks & R. Davies), “*Fine-Tuning in the Physical Universe*”, Cambridge University Press (2020)
5. Loeb, A. “*From the First Star to Milkmeda*”, Kindle, Amazon (2015).
4. Loeb, A. “*From the First Star to the End of Time*” (in hebrew), Carmel Publishing House, Israel (2015).
3. Loeb, A., & Furlanetto, S., “*The First Galaxies in the Universe*”, Princeton Series in Astrophysics, Princeton University Press (2013).
2. Loeb, A. “*How Did the First Stars and Galaxies Form?*”, Frontiers in Physics Series, Princeton University Press (2010).
1. Loeb, A., Ferrara, A., & Ellis, R. S. “*First Light in the Universe*”, SAAS-Fee winter school, Springer, New York (2008).

Papers and Essays

971. Loeb, A. “Galactic Kites”, RNAAS (2022). [arXiv:2205.10618]
970. Loeb, A. “Galactic Kites”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Kite.pdf>]
969. MacLeod, M., De, K., & Loeb, A. “Dusty, Self-Obscured Transients from Stellar Mergers and Common Envelope Phases”, ApJ (2022). [arXiv:2205.07929]

968. Loeb, A. “Thoughts About the First Congressional Hearing on Unidentified Objects in Half a Century”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Congress.pdf>]
967. Loeb, A. “Intergalactic Travel With MOND Rockets”, RNAAS (2022).
[arXiv:2205]
966. Loeb, A. “Alleviating the Tyranny of the Rocket Equation”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Rocket.pdf>]
965. Loeb, A. “Pushing the Frontiers of Science With Government Data”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/USG.pdf>]
964. Loeb, A. “Fishing In Extraterrestrial Seas”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Ent.pdf>]
963. Loeb, A. “Two Novel Observational Tests of General Relativity”, RNAAS (2022). [arXiv:2205.02746]
962. Loeb, A. “Cherish Those Junior Moments”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Jun.pdf>]
961. Loeb, A. “How To Guide Our Life?”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Lif.pdf>]
960. Loeb, A. “Detecting the Memory Effect from a Black Hole Merger at the Galactic Center Through Lunar Ranging”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Moo.pdf>]
959. Loeb, A., “Detecting the Memory Effect from a Massive Black Hole Merger at the Galactic Center Through Lunar Ranging”, RNASS (2022).
[https://lweb.cfa.harvard.edu/~loeb/GW_arXiv.pdf]
958. Loeb, A. “The New Horizons Meteor”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Voy.pdf>]

957. Siraj, A. & Loeb, A. “New Constraints on the Composition and Initial Speed of CNEOS 2014-01-08”, RNAAS (2022). [arXiv:2204.08482]
956. Loeb, A. “The First Interstellar Meteor Had a Larger Material Strength Than Iron Meteorites”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Iron.pdf>]
955. Loeb, A. “Scooping Interstellar Fragments from the Ocean Floor”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/EB.pdf>]
954. Fragione, G., Loeb, A., Kocsis, B., & Rasio, F. “Merger Rates of Intermediate-Mass Black Hole Binaries in Nuclear Star Clusters”, MNRAS (2022). [arXiv:2204.03745]
953. Loeb, A. “Announcing the Closest and Farthest Objects from Outside the Solar System on the Same Week”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Kn.pdf>]
952. Loeb, A., “Limiting Flux Versus Redshift as a Flag of New Physics”, RNASS (2022). [https://lweb.cfa.harvard.edu/~loeb/Max_arXiv.pdf]
951. Loeb, A. “How Bright Can a Source in the Sky Be?”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Lim.pdf>]
950. Loeb, A. “The Scientific Method”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Sci.pdf>]
949. Loeb, A. “What Is Missing In Academia?”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Aca.pdf>]
948. Loeb, A., “Self-Interacting Dark Matter from Gravitational Scattering”, ApJL (2022). [<https://arxiv.org/abs/2203.11962>]
947. Loeb, A. “What Is Dark Matter?”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Silence.pdf>]
946. Loeb, A. “The Silence of Snow”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Rain.pdf>]

945. Loeb, A., “Spurious Radial Migration from Relativistic Effects in the Milky-Way Disk”, RNAAS (2022). [<https://arxiv.org/abs/2203.09028>]
944. Loeb, A. “The Substitute for the Drake Equation in Extraterrestrial Space Archaeology”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Alt.pdf>]
943. Loeb, A., “Gravitational Redshift for Wide Binaries in Gaia eDR3”, RNAAS (2022). [<https://arxiv.org/abs/2203.06461>]
942. Loeb, A. “The First Interstellar Meteor”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/ISM.pdf>]
941. Loeb, A. “Intelligent Communication”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Intell.pdf>]
940. MacLeod, M., Vick, M., & Loeb, A. “Tidal Wave Breaking in the Eccentric Lead-in to Mass Transfer and Common Envelope Phases”, ApJ (2022). [<https://arxiv.org/abs/2203.01945>]
939. Loeb, A. “Communicating with Extraterrestrials”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Com.pdf>]
938. Loeb, A., “Time Evolution of the CMB Quadrupole”, RNAAS (2022).
[<https://arxiv.org/abs/2203.01806>]
937. Szolgyen, A., MacLeod, M., & Loeb, A. “Eccentricity Evolution in Gaseous Dynamical Friction”, MNRAS (2022). [<https://arxiv.org/abs/2203.01334>]
936. Loeb, A. “Life Under the Ice”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Att.pdf>]
935. Loeb, A. “What Do the Best Scientists in the Milky Way Know?”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Hope.pdf>]
934. Loeb, A. “Milky-Way Gifts to Life Expectancy”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/MW.pdf>]

933. Loeb, A. “Mind the Gap: Cosmic Stoicism”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/CD.pdf>]
932. Loeb, A. “Our Biggest Global Challenge”, The Hill (2022).
[<https://www.cfa.harvard.edu/~loeb/Tree.pdf>]
931. Loeb, A., “A Hot Subdwarf Model for the 18.18 Minute Pulsar GLEAM-X”, RNAAS (2022). [<https://arxiv.org/abs/2202.04949>]
930. Padmanabhan, H., & Loeb, A. “Signatures of Supermassive Black Hole Binaries on Maser Systems”, MNRAS (2022). [[arXiv:2202.03437](https://arxiv.org/abs/2202.03437)]
929. Loeb, A. “Mysterious 18-Minute Radio Pulses Are Not from “Little Green Men””, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/HSD.pdf>]
928. Loeb, A., “Climate Change and Human Evolution from the Passage of the Solar System through a Cold Cloud 2-3Myrs ago”, Science (2022).
[<https://arxiv.org/abs/2202.01813>]
927. Loeb, A. “Galaxies Expand As They Emit Light”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Expand.pdf>]
926. Loeb, A., “Measuring the Expansion or Contraction of Galaxies”, RNAAS (2022). [<https://arxiv.org/abs/2202.00825>]
925. Loeb, A. “City Lights on Other Planets”, The Hill (2022).
[<https://www.cfa.harvard.edu/~loeb/CityLights.pdf>]
924. Loeb, A. “Intelligent Adaptation or Barbarian Duplication”, The Hill (2022).
[<https://www.cfa.harvard.edu/~loeb/Intel.pdf>]
923. Loeb, A. “Life Lessons After Sixty Years”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Lessons.pdf>]
922. Loeb, A. “Finding UAP from Above”, The Hill (2022).
[<https://www.cfa.harvard.edu/~loeb/Lab.pdf>]

921. Loeb, A. “Identifying the Unidentified”, The DeBrief (2022).
[<https://www.cfa.harvard.edu/~loeb/Loeb-UAP-Debrief.pdf>]
920. Loeb, A. “Digitizing Intelligence”, Medium (2022).
[<https://www.cfa.harvard.edu/~loeb/Digital.pdf>]
919. Loeb, A. “An Interview in the Metaverse”, The Hill (2022).
[<https://www.cfa.harvard.edu/~loeb/Meta.pdf>]
918. Loeb, A. “Extraordinary Evidence Requires Extraordinary Funding”, The DeBrief (2022).
[<https://thedebrief.org/extraordinary-evidence-requires-extraordinary-funding-the-search-for-extraterrestrial-technology/>]
917. Pacucci, F., Dayal, P., Harikane, Y., Inoue, A.K. & Loeb, A., “Are the Newly-Discovered $z \sim 13$ Drop-Out Sources Starburst Galaxies or Quasars?”, MNRAS (2022). [<https://arxiv.org/abs/2201.00823>]
916. Loeb, A. “Investing a Trillion Dollars per Year on What Matters”, The Hill (2022).
[<https://www.cfa.harvard.edu/~loeb/Trillion.pdf>]
915. Loeb, A. “Virtual Realities and Fermi’s Paradox”, The Hill (2022).
[<https://www.cfa.harvard.edu/~loeb/Makeup.pdf>]
914. Loeb, A. “Reinvigorating the UAP Legacy of Senator Harry Reid”, The Hill (2021).
[<https://www.cfa.harvard.edu/~loeb/Reid.pdf>]
913. Loeb, A. “Looking Through the Train”, Medium (2021).
[<https://www.cfa.harvard.edu/~loeb/Train.pdf>]
912. Loeb, A. “Fishing in Interstellar Space”, The DeBrief (2021).
[<https://www.cfa.harvard.edu/~loeb/Love.pdf>]
911. Loeb, A. “The Need for a Scientific Study of Satellite Data on UAP”, The Hill (2021).
[<https://www.cfa.harvard.edu/~loeb/Sat.pdf>]

910. Loeb, A. “Against the Wind”, Medium (2021).
[<https://www.cfa.harvard.edu/~loeb/Feed.pdf>]
909. Loeb, A. “The Tricky Reality of Reality”, Medium (2021).
[<https://www.cfa.harvard.edu/~loeb/VR.pdf>]
908. Loeb, A. “Reality is not Virtual”, The DeBrief (2021).
[<https://www.cfa.harvard.edu/~loeb/Comp.pdf>]
907. Gallaudet, T., & Loeb, A. “Will We Soon Rewrite Textbooks on Our Place in the Universe?”, The Hill (2021).
[<https://www.cfa.harvard.edu/~loeb/UAP-TG-AL.pdf>]
906. Loeb, A. “Risk Assessment in Mainstream Science”, Medium (2021).
[<https://www.cfa.harvard.edu/~loeb/Risk.pdf>]
905. Loeb, A. “Dating the Next ‘Oumuamua”, The Debrief (2021).
[<https://www.cfa.harvard.edu/~loeb/Mark.pdf>]
904. Loeb, A., “A New Way to Limit the Interaction of Dark Matter with Baryons”, PRL (2021). [<https://arxiv.org/abs/2111.14891>]
903. Siraj,, A. & Loeb, A. “The New Astronomical Frontier of Interstellar Objects”, Astrobiology (2021). [arXiv:2111.05516]
902. Loeb, A. “The Fly on the Porch of My Home”, The Debrief (2021).
[<https://www.cfa.harvard.edu/~loeb/Most.pdf>]
901. Loeb, A. “AI-Scientists May Usher In a Bright Future in the Search for Extraterrestrial Intelligence”, The Debrief (2021).
[<https://thedebrief.org/ai-scientists-search-for-extraterrestrials/>]
900. Loeb, A. “Health Risks of Space Tourism”, The Hill (2021).
[<https://www.cfa.harvard.edu/~loeb/OpLo.pdf>]
899. Loeb, A. “The Thread Between Space Exploration and Spirituality”, Medium (2021).
[<https://www.cfa.harvard.edu/~loeb/SciRel.pdf>]

898. Loeb, A. “Our Future May Be Better With AI Scientists”, Medium (2021).
[<https://www.cfa.harvard.edu/~loeb/AI-Science.pdf>]
897. Loeb, A. “Science and Religion”, Medium (2021).
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