

Feraz Azhar

Department of Philosophy
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ACADEMIC APPOINTMENTS

University of Notre Dame, Notre Dame, IN, U.S.A. 8/2019–Present
Assistant Professor of Philosophy
Department of Philosophy
On leave at the Black Hole Initiative, Harvard University: Spring 2020 & 2021

Harvard University, Cambridge, MA, U.S.A. 9/2017–8/2019
Postdoctoral Research Fellow
Black Hole Initiative

EDUCATION

PHILOSOPHY

University of Cambridge, Trinity College, Cambridge, U.K. 10/2014–7/2017
Department of History and Philosophy of Science
Ph.D. 7/2017. Thesis: *Probabilistic reasoning in the inflationary universe*

Massachusetts Institute of Technology, Cambridge, MA, U.S.A. 1/2016–8/2016
Visiting Student: Program in Science, Technology, and Society

University of Sydney, Sydney, NSW, Australia 2/2013–8/2014
School of History and Philosophy of Science
M.Sc. 8/2014. Thesis: *Vehicles of informational content in neural networks*

SCIENCE

Johns Hopkins University, Baltimore, MD, U.S.A. 1/2011–4/2012
Postdoctoral Research Fellow
Department of Neurosurgery, Johns Hopkins University School of Medicine

Harvard University, Cambridge, MA, U.S.A. 3/2009–12/2010
Postdoctoral Research Fellow, Harvard Medical School
Department of Neurosurgery, Brigham and Women's Hospital (5/10–12/10)
Department of Ophthalmology, Boston Children's Hospital (3/09–4/10)

University of California, Santa Barbara, CA, U.S.A. 9/2002–12/2008
Department of Physics
Ph.D. 12/2008, **M.A.** 3/2007. Thesis: *An information theoretic study of neural populations*

Princeton University, Princeton, NJ, U.S.A. 10/2005–8/2006
Joseph Henry Laboratories of Physics & Lewis-Sigler Institute for Integrative Genomics
Visiting Student Research Collaborator

University of Cambridge, St. John's College, Cambridge, U.K. 10/2001–6/2002
Department of Applied Mathematics and Theoretical Physics
M.A.St. (Part III of the Mathematical Tripos)

University of Sydney, Sydney, NSW, Australia 2/1997–12/2000
B.Sc. (Advanced) Honours in Applied Mathematics
Thesis: *Ashtekar variables in canonical gravity*

* denotes the author list is alphabetical

† denotes equal contribution

JOURNAL ARTICLES AND BOOK CHAPTERS

Probabilistic inference in very large universes

F. Azhar, A. H. Guth & M. H. Namjoo*

Physical Review D (Forthcoming)

Spacetime singularities and indeterminism

F. Azhar & M. H. Namjoo

Synthese **206**, 93, (2025)

Rethinking the Anthropic Principle

F. Azhar & N. Linnemann†

Philosophy of Science **92**, 361–379, (2025)

Better guesses

N. Linnemann & **F. Azhar**†

Philosophy and Phenomenological Research **110**, 661–686, (2025). Published online: (2024)

Flows into de Sitter space from anisotropic initial conditions: An effective field theory approach

F. Azhar & D. I. Kaiser

Physical Review D **107**, 043506, (2023)

A Bayesian view on the Dr. Evil scenario

F. Azhar, A. H. Guth & M. H. Namjoo*

Erkenntnis **89**, 355, (2024). Published online: (2022)

Finely tuned models sacrifice explanatory depth

F. Azhar & A. Loeb

Foundations of Physics **51**, 91, (2021)

Effective field theories as a novel probe of fine-tuning of cosmic inflation

F. Azhar

Studies in History and Philosophy of Modern Physics **71**, 87–100, (2020)

Gauging fine-tuning

F. Azhar & A. Loeb

Physical Review D **98**, 103018, (2018)

Flows into inflation: An effective field theory approach

F. Azhar & D. I. Kaiser

Physical Review D **98**, 063515, (2018)

Scientific realism and primordial cosmology

F. Azhar & J. Butterfield

In *The Routledge Handbook on Scientific Realism*, ed. J. Saatsi. London: Routledge, pp. 304–320, (2018)

Three aspects of typicality in multiverse cosmology

F. Azhar

In: *EPSA15 Selected Papers*, eds. M. Massimi, J.-W. Romeijn & G. Schurz. *European Studies in Philosophy of Science*, vol. 5, Cham: Springer, pp. 125–136, (2017)

Spectra of conditionalization and typicality in the multiverse

F. Azhar

Physical Review D, **93**(04), 043506, (2016)

Polytopes as vehicles of informational content in feedforward neural networks

F. Azhar

Philosophical Psychology, **29**(5), 697–716, (2016)

Testing typicality in multiverse cosmology

F. Azhar

Physical Review D, **91**(10), 103534, (2015)

Prediction and typicality in multiverse cosmology

F. Azhar

Classical and Quantum Gravity, **31**(3), 035005, (2014)

Predicting single-neuron activity in locally connected networks

F. Azhar & W. S. Anderson

Neural Computation, **24**(10), 2655–2677, (2012)

Epileptic seizures from abnormal networks: Why some seizures defy predictability

W. S. Anderson, **F. Azhar**, P. Kudela, G. K. Bergey & P. J. Franaszczuk

Epilepsy Research, **99**(3), 202–213, (2012)

CONFERENCE PROCEEDINGS

Automating interictal spike detection: Revisiting a simple threshold rule

A. Palepu, S. Premanathan, **F. Azhar**, M. Vendrame, T. Loddenkemper, C. Reinsberger, G. Kreiman, K. A. Parkerson, S. Sarma & W. S. Anderson

In: *40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBC 2018*, pp. 299–302, (2018)

BOOK REVIEWS

Interdisciplinarity and Modern Cosmology

F. Azhar

Review of *The Oxford Handbook of the History of Modern Cosmology*. Edited by H. Kragh & M. S. Longair, Oxford: Oxford University Press (2019).

In: *Journal for the History of Astronomy*, **51**(4), 485–486, (2020)

PAPERS ONLINE

When are correlations strong?

F. Azhar & W. Bialek

Preprint: <http://arxiv.org/abs/1012.5987>

THESES

Probabilistic reasoning in the inflationary universe

F. Azhar: Doctoral Dissertation (Philosophy of Physics)

University of Cambridge, U.K. (2017)

Vehicles of informational content in neural networks

F. Azhar: Master's Thesis (Philosophy of Neuroscience)

University of Sydney, Australia (2014)

An information theoretic study of neural populations

F. Azhar: Doctoral Dissertation (Theoretical Physics)

University of California, Santa Barbara, U.S.A. (2008)

Ashtekar variables in canonical gravity
 F. Azhar: Undergraduate Honours Thesis (Applied Mathematics)
 University of Sydney, Australia (2000)

SELECTED TALKS

† Invited talk

* Refereed and accepted conference submission

§ Rescheduled or cancelled due to COVID-19

05/2025 *Rethinking the Anthropic Principle*[†]

Black Hole Initiative, Harvard University, U.S.A.

11/2024 *Three Aspects of Typicality in Multiverse Cosmology*[†]

LSE-Cambridge Foundations of Physics Reading Group (Via Zoom)

09/2024 *Rethinking the Anthropic Principle*[†]

Center for Philosophy of Science, University of Pittsburgh, U.S.A.

11/2023 *Flows into de Sitter space from anisotropic initial conditions: An effective field theory approach*[†]

Beyond Spacetime project and the Rotman Institute of Philosophy, Western University, Canada

07/2022 *Flows into de Sitter from anisotropic initial conditions: An effective field theory approach*[†]

Bonn History & Philosophy of Physics Seminar Series, Univ. of Bonn, Germany (Via Zoom)

05/2022 *Spacetime singularities and a novel schema for indeterminism*[†]

Black Hole Initiative Annual Conference, Harvard University, U.S.A.

12/2021 *Effective field theories as a novel probe of fine-tuning of cosmic inflation*[†]

Department of Philosophy, University of Illinois, Chicago, U.S.A.

07/2020 *(Some) philosophical aspects of cosmic inflation*[†]

(Virtual) Midwest Summer School in Philosophy of Physics (U.S.A.)

07/2020 *Finely tuned models sacrifice explanatory depth*^{*§}

British Society for the Philosophy of Science Annual Conference, Kent, U.K.

05/2020 *Finely tuned models sacrifice explanatory depth*[†]

Black Hole Initiative Foundations Seminar, Harvard University, U.S.A. (Via Zoom)

05/2019 *Assessing fine-tuning of cosmic inflation*[†]

HPS Colloquium, Stanford University, U.S.A.

05/2018 *Quantifying fine-tuning in the early universe: Primordial black holes as dark matter*[†]

High Energy Phenomena Seminar, Harvard-Smithsonian Center for Astrophysics, Harvard University, U.S.A.

05/2018 *Quantifying fine-tuning in the early universe: Primordial black holes and habitable halos*[†]

Black Hole Initiative Annual Conference, Harvard University, U.S.A.

04/2018 *Inflationary trajectories: An effective field theory approach*[†]

MIT/Tufts Cosmology Seminar (at MIT), U.S.A.

04/2018 *Inflationary trajectories: An effective field theory approach*[†]

Institute for Theory and Computation (luncheon talk), Harvard University, U.S.A.

11/2017 *Inflationary trajectories: An effective field theory approach*[†]

Black Hole Initiative Colloquium, Harvard University, U.S.A.

02/2017 *Three aspects of typicality in multiverse cosmology*[†]

Workshop in methodological and epistemological issues in cosmology, UC Irvine, U.S.A.

11/2016 *Three aspects of typicality in multiverse cosmology*[†]

LSE Sigma Club, London, U.K.

09/2015 *Testing typicality in multiverse cosmology*^{*}

European Philosophy of Science Association 2015. Düsseldorf, Germany.

08/2015 *Testing typicality in multiverse cosmology**
 15th Congress of Logic, Methodology and Philosophy of Science. Helsinki, Finland.

04/2015 *Testing typicality in multiverse cosmology**
 1st Munich Graduate Workshop in Mathematical Philosophy: Philosophy of Physics. LMU, Munich, Germany.

03/2014 *Prediction and typicality in multiverse cosmology*†
 Sydney Foundations of Physics Seminar. University of Sydney, Australia

AT NOTRE DAME:

09/2024 *The Anthropic Principle*†
Food for Thought series, Department of Philosophy, University of Notre Dame, U.S.A.

03/2022 *The flow into inflation: An effective field theory approach*†
 Astrophysics Seminar, University of Notre Dame, U.S.A.

02/2022 *Spacetime singularities and a novel formulation of indeterminism*†
 HPS Colloquium, University of Notre Dame, U.S.A.

01/2019 *Assessing fine-tuning of cosmic inflation*†
 Department of Philosophy, University of Notre Dame, U.S.A.

IN THE NEWS

[The Simple Truth about Physics](#), *Scientific American*, January 1, 2020

GRANTS

Faculty Research Support Program FY2019 2020–2026
 University of Notre Dame (Co-PI with Prof. Nicholas Teh)
Establishing the Effective Theory Paradigm for Basic Science

SELECTED HONORS AND AWARDS

Wittgenstein Studentship in Philosophy 2014–2017
 Trinity College, University of Cambridge

Postgraduate Research Prize 2014
 Faculty of Science, University of Sydney
For philosophy of physics publication, titled: “Prediction and typicality in multiverse cosmology”

Outstanding Teaching Associate 2006/2007
 Department of Physics, University of California, Santa Barbara

Eleanor Sophia Wood Postgraduate Research Traveling Scholarship 2003–2006
 University of Sydney, for study at U.C. Santa Barbara and Princeton University

Benefactor’s Scholarship 2001–2002
 St. John’s College, University of Cambridge

University Medal 2000
 Applied Mathematics, University of Sydney

TEACHING EXPERIENCE

PHILOSOPHY

University of Notre Dame

As lecturer

- Probabilistic Methods in Philosophy Fall 2025
- Probability Spring 2025
- Introduction to Philosophy: Philosophy and Science Spring 2025

- Introduction to Philosophy: Philosophy and Science Fall 2024
- Introduction to Philosophy: Philosophy and Science Spring 2024
- Philosophy of Cosmology Fall 2023
- Introduction to Philosophy: Philosophy and Science Fall 2023
- Introduction to Philosophy: Philosophy and Science Spring 2023
- Topics in the Philosophy of Physics
(co-taught with Prof. Nic Teh) Fall 2022
- Introduction to Philosophy: Philosophy and Science Fall 2022
- Introduction to Philosophy: Philosophy and Science Spring 2022
- Interpretations and Applications of Probability in the Physical Sciences
(co-taught with Prof. Harvey Brown) Fall 2021
- Introduction to Philosophy: Philosophy and Science Fall 2021
- Philosophy of Cosmology Fall 2020
- Introduction to Philosophy: Philosophy and Science Fall 2020
- Introduction to Philosophy: Philosophy and Science (×2) Fall 2019

As guest lecturer

- Led a graduate seminar at the Department of Philosophy, University of Illinois, Chicago, on
“Spacetime singularities and a novel formulation of indeterminism” Fall 2021

University of Cambridge

As lecturer

- Part II Philosophy: Paper 6, Philosophy of Science
(co-taught with Dr. Jeremy Butterfield) Lent 2017

As supervisor

- Part IB History and Philosophy of Science (HPS) AY 2016/2017
- Part II Philosophy: Paper 6, Philosophy of Science Michaelmas 2015
- Part IB Philosophy Michaelmas 2015

SCIENCE/MATH

University of Sydney

As tutor

- Differential Calculus (Advanced) (MATH1901) Semester 1, 2013

University of California, Santa Barbara

As lecturer

- Mathematical Methods of Theoretical Physics (100A) Summer 2008
- Introductory Physics (6B) Spring 2008
- Introductory Physics (6A) Winter 2008
- Introductory Physics (6B) Spring 2007
- Introductory Physics (6A) Winter 2007

As teaching assistant

- General Physics (21) Winter 2005
- Introductory Physics (6A, 6B, 6C, 10): Various quarters during 9/02–8/05, 9/06–12/08

SELECTED
SERVICE

UNIVERSITY OF NOTRE DAME

- First-year advising (Philosophy) AY 2025-2026
- HPS Executive Committee (incl. Graduate Admissions) AY 2025-2026
- Graduate pedagogy presenter (Philosophy) AY 2025-2026
- Faculty Search Committee (Philosophy) AY 2024-2025
- First-year advising (Philosophy) AY 2024-2025
- HPS Executive Committee (incl. Graduate Admissions) AY 2024-2025
- Graduate Admissions Committee (Philosophy) AY 2023-2024
- First-year advising (Philosophy) AY 2023-2024
- First-year advising (Philosophy) AY 2022-2023
- Graduate pedagogy presenter (Philosophy) AY 2022-2023
- Graduate Admissions Committee (Philosophy) AY 2021-2022
- First-year advising (Philosophy) AY 2021-2022
- First-year advising (Philosophy) Fall 2020
- Cushing Prize Committee member (Philosophy/HPS) Spring 2020
- Mock interview committees (2) (Philosophy) Fall 2019

HARVARD UNIVERSITY

- Organizer for the Black Hole Initiative (BHI) Philosophy Working Group (weekly meetings) (10/2017–5/2019)
- Organizer for the BHI Philosophy Mini-Workshop Series, titled “The Philosophy of Extreme Spacetimes” (11/2017–5/2019)
- BHI Colloquium Committee member (9/2017–8/2019)

SERVICE TO PROFESSION

- Reviewed papers for: *The British Journal for the Philosophy of Science*, *Philosophical Psychology*, *Philosophy of Science*, *Studies in History and Philosophy of Modern Physics*, *Studies in History and Philosophy of Science*, *Synthese*, *Oxford University Press*