

Sander Beckers
Curriculum Vitae

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[google scholar page](#)

Research Areas

Areas of Specialization: Causal Models, Ethics of AI, Explainable AI, Responsible AI

Areas of Competence: Formal Epistemology, Philosophy of AI, Philosophy of Science

Employment

10/2024-?	Postdoctoral researcher, Department of Computer Science, Cornell University
2023-2024	Postdoctoral researcher, Institute for Logic, Language, and Computation, University of Amsterdam
2021-2023	Postdoctoral researcher, Cluster for excellence in Machine Learning for Science: Ethics and Epistemology of Machine Learning, University of Tübingen
2019-2021	Humboldt postdoctoral fellow (supervisor: Stephan Hartmann) Munich Center for Mathematical Philosophy, LMU
2018-2019	Postdoctoral scholar (supervisor: Jan Broersen) Department of Philosophy and Religious Studies, Utrecht University
2016-2017	Postdoctoral B.A.E.F. Fellow (supervisor: Joe Halpern) Department of Computer Science, Cornell University
2010-2011	Researcher at University of Leuven, EAVISE research group <i>Project: S.O.S. OpenCL: Multicore Cooking</i>
2008-2009	internship as actuary, Aon Benfield Belgium and BNP Paribas Belgium, Employee Benefits

Research Visits

2022 Spring	Visiting scholar (host: James Woodward) Department of History and Philosophy of Science, University of Pittsburgh
2020 Fall	NIAS-Lorentz Theme-group fellow on Explainable AI in medicine, Netherlands Institute for Advanced Studies, Amsterdam
2019 January	Visiting scholar (host: Frederick Eberhardt) Division of the Humanities and Social Sciences, Caltech
2017 Fall	Visiting scholar (host: James Conant) Institute of Philosophy, Leipzig University

Education

2012-2016	Ph.D. in Computer Science, October 2016, University of Leuven
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	<i>Dissertation: Actual Causation: Definitions and Principles</i> <i>Supervisors: Hendrik Blockeel and Joost Vennekens</i>
2011	Master in Mathematics, University of Leuven (distinction) <i>Dissertation: Deductive Reasoning in Guarded FO(ID)</i> <i>Supervisor: Marc Denecker</i>
2008	Bridge program in Mathematics, University of Leuven
2006	Master in Philosophy, University of Leuven (distinction) <i>Dissertation: Wittgenstein en het Ethische</i> <i>Supervisor: Arnold Burms</i>
2004	Bachelor in Philosophy, University of Antwerp (distinction)

Grants, Fellowships, and Awards

2023	Best Paper Award: Backtracking Counterfactuals, <i>CLear</i> 2023.
2020 Fall	NIAS-Lorentz Theme Group
2019-2021	Humboldt Research Fellowship for Postdoctoral Researchers
2016-2017	Research Fellowship, Belgian American Educational Foundation
2012-2015	Ph.D. Grant for Fundamental Research, Flanders Innovation & Entrepreneurship

Conference Organization

2023 Workshop on **Causality for Ethics and Society**, LMU Munich. Co-organized with Naftali Weinberger.

PhD committees

2025 Final reader, PhD in Philosophy of Science, Luna De Souter, University of Bergen, Norway
 2023 Substitute committee member, PhD in Logic, Dean McHugh, University of Amsterdam

Refereeing

AAAI (PC 2017, 2020, 2021, 2022, 2023, 2024), AI & Society, AIES conference (2024), AISTATS 2022, Analysis (2), Australasian Journal of Logic, *CLear* (2024, 2025), Dialectica, Ergo, Erkenntnis (6), Ethics and Information Technology (2), European Journal for Philosophy of Science (2), FaccT 2023, Information, IJCAI 2020, Journal of Causal Inference, Journal of Logic and Computation, Journal of Machine Learning Research (2), Journal of Philosophical Logic (2), Journal of Philosophy, Journal of Social Philosophy, Kriterion, Mind, Minds and Machines (3), NeurIPS (2023, 2024), Philosophical Studies (3), Philosophy and Theory of Artificial Intelligence, Philosophy of Science, Synthese (6), Review of Symbolic Logic, The Philosophical Review, UAI (2024, 2025), Various AI workshops for AAAI, NeurIPS, ICML, etc.

Research

Main Publications

- [1] Beckers, S. (2025). Nondeterministic Causal Models, *CLear* 2025.
- [2] Beckers, S. (2025). Actual Causation in Nondeterministic Causal Models, *CLear* 2025.
- [3] Belle, V., Chockler, H., Vallor, S., Varshney, K.R., Vennekens, J., and Beckers, S. (2024). Trustworthiness and Responsibility in AI - Causality, Learning and Verification (Dagstuhl Seminar 24121) *Dagstuhl Reports*
- [4] Beckers, S., Chockler, H., and Halpern, J.Y. (2024). A Causal Analysis of Harm, *Minds and Machines*

- [5] Beckers, S. (forthcoming). What Does it Take to Make a Difference? Reply to Andreas and Günther, *Journal of Philosophy*.
- [6] Beckers, S. (2023). Moral Responsibility for AI Systems, *NeurIPS 2023*.
- [7] Beckers, S., Chockler, H., and Halpern, J.Y. (2023). Quantifying Harm, *IJCAI 2023*.
- [8] Beckers, S., Halpern, J.Y., and Hitchcock, C. (2023). Causal Models with Constraints, *CLear 2023*.
- [9] von Kügelgen, J., Mohamed, A., and Beckers, S. (2023). Backtracking Counterfactuals, *CLear 2023*.
Best Paper Award
- [10] Beckers, S., Chockler, H., and Halpern, J.Y. (2022). A Causal Analysis of Harm, *NeurIPS 2022*.
- [11] Beckers, S. (2022). Causal Explanations and XAI, *CLear 2022*.
- [12] Beckers, S. (2021). Causal Sufficiency and Actual Causation, *Journal of Philosophical Logic*
- [13] Beckers, S. (2021). The Counterfactual NESS Definition of Causation, *AAAI 2021*
- [14] Beckers, S. (2021). Equivalent Causal Models, *AAAI 2021*
- [15] Beckers, S., Eberhardt, F., and Halpern, J.Y. (2019). Approximate Causal Abstraction, *UAI 2019*
- [16] Beckers, S. and Halpern, J.Y. (2019). Abstracting Causal Models, *AAAI 2019*
- [17] Beckers, S. (2018). AAAI: an Argument Against Artificial Intelligence, *Philosophy and Theory of Artificial Intelligence 2017*.
- [18] Beckers, S. and Vennekens, J. (2018). A Principled Approach to Defining Actual Causation, *Synthese*.
- [19] Beckers, S. and Vennekens, J. (2017). The Transitivity and Asymmetry of Actual Causation, *Ergo*.
- [20] Beckers, S. and Vennekens, J. (2016). A General Framework for Defining and Extending Actual Causation using CP-logic, *International Journal for Approximate Reasoning*.

Talks

Invited Talks (regular Conference Talks not included)

- 2025-07 Invited Keynote Speaker, UAI workshop on ‘Causal Abstractions and Representations’, Rio de Janeiro
- 2025-07 Invited Keynote Speaker, closing workshop of the ‘Bias, Risk and Opacity in AI Research Project, University of Milan
- 2025 ‘Personalised Decision-Making in Medicine and Causing Harm’, Invited Speaker, University of Exeter series on ‘Causality’ (online)
- 2025 ‘Actual Causation in Nondeterministic Causal Models’, Invited speaker, University of Bergen
- 2024 ‘A Causal Analysis of Harm’, colloquium, Munich Center for Mathematical Philosophy, LMU
- 2024 ‘Causal Abstractions using Generalized Functions’, Invited speaker, Causal Abstraction, Reasoning, and Extrapolation seminar (online)
- 2024 ‘Moral Responsibility for AI Systems’, Dagstuhl Seminar on Trustworthiness and Responsibility in AI
- 2023 ‘What Does It Take to Make a Difference? A Reply to Andreas and Günther’, Invited speaker, PALLMYR, University College London

2023 ‘Moral Responsibility for AI Systems’, Invited speaker, Amsterdam Causality Meeting

2023 ‘Backtracking Counterfactuals’, Invited speaker, Artificial Intelligence, Causality, and Personalised Medicine Symposium, Leibniz AI Lab

2023 ‘Backtracking Counterfactuals’, Invited speaker, Kyoto Causation Workshop, Kyoto University

2023 ‘A Causal Analysis of Harm’, Invited speaker, SIKS course on Human-Centered AI, Utrecht

2023 ‘A Causal Analysis of Harm’, Invited speaker, Causality in Practice, Institute Pascal, Paris

2023 ‘Backtracking Counterfactuals’, Invited speaker, Inspiration Sessions, SAP (online)

2023 ‘Causal Sufficiency and Actual Causation’, Invited speaker, Workshop on Causation and Modality in Logic and Language, University of Amsterdam

2023 ‘Abstracting Causal Models’, Invited speaker, Causality Discussion Group (online)

2022 ‘Causal Abstractions and Causal Representation Learning’, Invited speaker, First Workshop on Causal Representation Learning, UAI, Eindhoven

2022 ‘Causal Sufficiency and Actual Causation’, Invited speaker, Online Causal Inference Seminar (online)

2021 ‘The Causal and Epistemic Conditions for Moral Responsibility’, Invited speaker, Christian List’s Research Seminar, LMU-Munich (online)

2021 ‘Causal Sufficiency and Actual Causation’, Invited speaker, Logic Seminar, University of Milan (online)

2021 ‘Reflections on the Causal Approach to Fair AI’, Invited speaker, AI Challenges to Established Legal Institutions Roundtable Conference, Monash University (online)

2021 ‘Actual Causation and Moral Responsibility’, Invited speaker, Cognition, Values, and Behaviour Lab Meetings, LMU-Munich, Germany (online)

2020 ‘Accountability in medical autonomous systems: ethical and epistemological challenges for explainable AI’, NIAS Theme group, NIAS seminar, Amsterdam, the Netherlands (online)

2020 ‘Formalizing Non-Reductive Supervenience using Causal Models with Constraints’, Invited speaker, Symposium on Interventionism and Causal Exclusion, Nijmegen, the Netherlands

2019 ‘Causation and the Principle of Alternative Possibilities’, Invited speaker, Free Will and Causality conference, Dusseldorf, Germany

2018 ‘Applying Causal Modeling to Philosophical Issues’, Invited speaker, Logic and Metaphysics Workshop, CUNY

2017 ‘Formal Ethics’, Invited speaker, Center for Human-Compatible AI, UC Berkeley

2015 ‘A Principled Approach to Defining Actual Causation’, Invited speaker, Tilburg Center for Logic, Ethics, and Philosophy of Science, the Netherlands

2015 ‘The Problem of Actual Causation’, Epistemology Reading Group, Department of Linguistics and Philosophy, MIT

2014 ‘Actual Causation using CP-logic’, Declarative Languages and AI seminar, University of Leuven, Belgium

2013 ‘Actual Causation using CP-logic’, colloquium, Munich Center for Mathematical Philosophy

2013 ‘Actual Causation: the CP-logic Approach’, Invited talk, INRIA, Grenoble, France

2013 ‘Actual Causation in Cases of Preemption: the CP-logic Approach’, Center for Logic and Analytic Philosophy colloquium, University of Leuven, Belgium

2012 ‘Parallel hybrid SAT solving using OpenCL’, Declarative Languages and AI seminar, University of Leuven, Belgium

Teaching

University of Amsterdam

Bachelor in Artificial Intelligence, lectures:
2023-2024: Philosophy & AI

Master of Logic, lectures:
2023: Philosophical Logic

Master of Logic, seminar:
2024: Actual Causation

Utrecht University

Bachelor in Philosophy, tutorials:
2018-2019: Logic for philosophers
2018-2019: Epistemology and Philosophy of Science
2019: Philosophical Reflection on Scientific Models of Man

Bachelor in Artificial Intelligence, lectures:
2018: Introduction to Statistics

Master in Artificial Intelligence:
2018: Philosophy of AI, tutorials
2018-2019: Philosophy of AI, two guest lectures

University of Leuven

Bachelor in Civil Engineering, exercise classes:
2014-2015 Introduction to Programming: Python
2012-2013 Introduction to Programming: Java

Bachelor in Industrial Engineering, exercise classes:
2015: Introduction to the IDP knowledge base system
2014-2015 Introduction to Programming: Python
2010-2013 Introduction to Programming: C