

## Sander Beckers

### *Curriculum Vitae*

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## Research Areas

**Areas of Specialization:** Causality, Ethics and Epistemology of AI, Philosophy of Science

**Areas of Competence:** Formal Epistemology, Logic, Ethics, Philosophy of AI, Wittgenstein

## Employment

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|--------------|--|
| 2023-current | 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)<br>Munich Center for Mathematical Philosophy, LMU  |
| 2018-2019    | Postdoctoral scholar (supervisor: Jan Broersen)<br>Department of Philosophy and Religious Studies, Utrecht University                                |
| 2016-2017    | Postdoctoral B.A.E.F. Fellow (supervisor: Joe Halpern)<br>Department of Computer Science, Cornell University   |
| 2010-2011    | Researcher at University of Leuven, EAVISE research group<br><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

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

## Education

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|-----------|--|
| 2012-2016 | Ph.D. in Computer Science, October 2016, University of Leuven<br><i>Dissertation: Actual Causation: Definitions and Principles</i><br><i>Supervisors: Hendrik Blockeel and Joost Vennekens</i> |
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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	<b>Best Paper Award:</b> 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.

### Refereeing

AAAI (Program Committee 2017, 2020, 2021, 2022, 2023, 2024), AISTATS 2022, Analysis (2), Australasian Journal of Logic, Dialectica, Erkenntnis (5), Ethics and Information Technology (2), European Journal for Philosophy of Science (2), FaccT (Program Committee 2023), Information, IJCAI (Program Committee 2020), Journal of Causal Inference, Journal of Machine Learning Research, Journal of Philosophical Logic (2), Journal of Social Philosophy, Kriterion, Mind, Minds and Machines (3), NeurIPS (2023), Philosophical Studies, Philosophy and Theory of Artificial Intelligence, Philosophy of Science, Synthese (6), Review of Symbolic Logic, The Philosophical Review, Various AI workshops for AAAI, NeurIPS, ICML, etc.

### Research

#### Main Publications

- [1] Beckers, S. (accepted). What Does it Take to Make a Difference? Reply to Andreas and Günther, *Journal of Philosophy*.
- [2] Beckers, S. (2023). Moral Responsibility for AI Systems, *NeurIPS* 2023.
- [3] Beckers, S., Chockler, H., and Halpern, J.Y. (2023). Quantifying Harm, *IJCAI* 2023.
- [4] Beckers, S., Halpern, J.Y., and Hitchcock, C. (2023). Causal Models with Constraints, *CLear* 2023.
- [5] von Kügelgen, J., Mohamed, A., and Beckers, S. (2023). Backtracking Counterfactuals, *CLear* 2023.  
**Best Paper Award**
- [6] Beckers, S., Chockler, H., and Halpern, J.Y. (2022). A Causal Analysis of Harm, *NeurIPS* 2022.

- [7] Beckers, S. (2022). Causal Explanations and XAI, *CLear 2022*.
- [8] Beckers, S. (2021). Causal Sufficiency and Actual Causation, *Journal of Philosophical Logic*
- [9] Beckers, S. (2021). The Counterfactual NESS Definition of Causation, *AAAI 2021*
- [10] Beckers, S. (2021). Equivalent Causal Models, *AAAI 2021*
- [11] Beckers, S., Eberhardt, F., and Halpern, J.Y. (2019). Approximate Causal Abstraction, *UAI 2019*
- [12] Beckers, S. and Halpern, J.Y. (2019). Abstracting Causal Models, *AAAI 2019*
- [13] Beckers, S. (2018). AAAI: an Argument Against Artificial Intelligence, *Philosophy and Theory of Artificial Intelligence 2017*.
- [14] Beckers, S. and Vennekens, J. (2018). A Principled Approach to Defining Actual Causation, *Synthese*.
- [15] Beckers, S. and Vennekens, J. (2017). The Transitivity and Asymmetry of Actual Causation, *Ergo*.
- [16] 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 and Colloquia (regular Conference Talks not included)

- 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 ‘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 talk, Logic and Metaphysics Workshop, CUNY

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

2015 ‘A Principled Approach to Defining Actual Causation’, Invited talk, 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: Philosophy & AI  
 Master of Logic, lectures:  
 2023: Philosophical Logic

### **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

## References

Joseph Halpern

Professor at the Department of Computer Science, Cornell University

halpern@cs.cornell.edu

Stephan Hartmann

Professor at the Munich Center for Mathematical Philosophy, Ludwig Maximilian University

S.Hartmann@lmu.de

James Woodward

Professor at the Department of History and Philosophy of Science, University of Pittsburgh

jfw@pitt.edu