Sébastien Rivat

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Research

Areas of Specialization: Philosophy of Physics, Philosophy of Science, History of Physics
Areas of Competence: Logic, Metaphysics, Early Modern Philosophy, Ethics

Academic Appointments

Munich Center for Mathematical Philosophy, LMU Munich 2024 - present
Assistant Professor, Principal Investigator for the research project *The Scale Revolution in Physics* (Pioneering Research grant, 400,300 €, Volkswagen Foundation)

Munich Center for Mathematical Philosophy, LMU Munich 2022 - 2024
Postdoctoral Fellow

Max Planck Institute for the History of Science, Berlin 2020 - 2022
Postdoctoral Fellow (affiliated member since September 2022)

Education

Columbia University 2013 - 2020
Ph.D., Philosophy (M.A., 2015; M.Phil, 2017)
Dissertation: *Representation and Realism in the Age of Effective Theories*
Committee: David Albert (adviser), Achille Varzi, Jenann Ismael (Johns Hopkins), David Wallace (Pittsburgh), Porter Williams (Pittsburgh)

University of Cambridge, Queens' College 2012 - 2013
M.Phil, History and Philosophy of Science and Medicine, first class honors

University of Cambridge, Queens' College 2011 - 2012
MASt (Part III), Applied Mathematics and Theoretical Physics, distinction

Ecole Centrale Paris 2008 - 2012
B.S. (eq.), Mathematics and Physics

Publications

6. Rivat, S., forthcoming, "Wait, Why Gauge?", *The British Journal for the Philosophy of Science*. [Journal] [Preprint]

5. Rivat, S., 2021, "Drawing Scales Apart: The Origins of Wilson's Conception of Effective Field Theories", *Studies in History and Philosophy of Science*, 90, 321-338. [Journal] [Preprint]

4. Rivat, S., 2021, "Effective Theories and Infinite Idealizations: A Challenge for Scientific Realism", *Synthese*, 198, 12107–12136. [Journal] [Preprint]

3. Rivat, S., & Grinbaum A., 2020, "Philosophical Foundations of Effective Field Theories", *The European Physical Journal A*, 56, 90. [Journal] [Preprint]

2. Rivat, S., 2019, "Renormalization Scrutinized", *Studies in History and Philosophy of Modern Physics*, 68C, 23-39. [Journal] [Preprint]

1. Rivat, S., 2014, "On the Heuristics of the Higgs Mechanism", *Journal for General Philosophy of Science*, 45(2), 351-367. Part of a master's thesis at Cambridge. [Journal] [Preprint]

Articles in Preparation

Under review

Article on the reference of theoretical terms (*Philosophers' Imprint*, revise and resubmit)
Article on the concepts of open and effective systems (under review)
Article on the history of renormalization group methods (under review)

In progress

"The Open Systems View in Field Theory" (with Stephan Hartmann)
"Why Discretize?"
"Mixing Scales" (with Henrique Gomes and Jeremy Butterfield)
"Qu'est-ce que la métaphysique effective?" (invited for publication in *Revue de Métaphysique et de Morale*)

Research Grants, Fellowships & Awards

Research Grants & Fellowships

Pioneering Research grant (400,300 €), Volkswagen Foundation	2023 - present
Core Curriculum Preceptorship (approx. $150,000), Columbia University	2018 - 2020
Kluge Graduate Fellowship (approx. $140,000, declined), Columbia University	2018 - 2020
Conference Funding ($18,000), Workshop, Columbia University	2018
Conference Funding ($16,000), Rutgers-Columbia Workshop, Rutgers University	2018
Space and Time After Quantum Gravity Summer Institute Grant, Chicago	2016
GSAS Dean's PhD Fellowship (approx. $360,000), Columbia University	2013 - 2018

Awards

D. H. Siff Award ($250), Best Paper in Philosophy of Science, Columbia University	2019
D. H. Siff Award ($250), Best Paper in Philosophy of Science, Columbia University	2018
Sidney Morgenbesser Fellowship, Faculty Nominated, Columbia University	2016
Lina Kahn Prize ($500), Best Paper in Metaphysics, Columbia University	2016
Alliance Programme Award ($4000), Columbia University	2015
Admitted to Queens' College Foundation	2012
Bachelor Scholarship (£300), Part III Distinction, Queens' College	2012

Past and Upcoming Talks

39. "La Référence des Termes Théoriques à la Lumière des Théories Effectives", *Les Jeudis de l'Histoire et de la Philosophie des Sciences*, ENS Ulm, Paris, France	Feb. 2024
38. "The Open Systems View in Field Theory" (joint work with Stephan Hartmann), *Open Cosmology workshop II*, Bristol, UK	Jan. 2024
37. "Why Discretize? Philosophical and Historical Lessons from Lattice Gauge Theories", *Discreteness and Precision in Physics*, IHPST, Paris, France	Nov. 2023

36. "The Open Systems View in Field Theory" (joint work with Stephan Hartmann), *The 9th biennial meeting of the European Philosophy of Science Association*, Belgrade, Serbia — Sep. 2023

35. "From the Infinite Universe to the Effective World", *Jahrestagung der Gesellschaft für die Geschichte der Wissenschaften, der Medizin und der Technik*, Ingoldstadt, Germany — Sep. 2023

34. "Wait, Why Gauge?", *The 21th European Conference on Foundations of Physics*, Bristol, UK — July 2023

33. "Wait, Why Gauge?", *The British Society for the Philosophy of Science (BSPS) Annual Conference*, Bristol, UK — July 2023

32. "Open Systems Across Scales", *Congrès de la Société de Philosophie des Sciences (SPS) 2023*, Université Paris Nanterre, France — May 2023

31. "De l'Univers Infini au Monde Effectif", *XIVe Congrès de la Société Française d'Histoire des Sciences et des Techniques*, Bordeaux, France — April 2023

30. "Ken Wilson's Early Concept of Effective Theory", Séminaire d'Histoire et de Philosophie de la Physique, IHPST & SPHERE, Paris, France — March 2023

29. "Open Systems Across Scales", *Open Cosmology workshop*, Munich Center for Mathematical Philosophy, LMU Munich, Germany — Nov. 2022

28. "Explanations in Physics", Center for Advanced Studies, LMU Munich, Germany — Nov. 2022

27. "How Theoretical Terms Effectively Refer", Departmental Colloquium, Munich Center for Mathematical Philosophy, LMU Munich, Germany — Nov. 2022

26. "How Theoretical Terms Effectively Refer", *The Fourth International Conference of the German Society for Philosophy of Science (GWP.2022)*, TU Berlin, Germany — Aug. 2022

25. "Steve Weinberg and the Rise of Systematic Low-energy Approximations", *Approximations to Second Order: Historical and Philosophical Perspectives*, MPIWG, Berlin, Germany — July 2022

24. "Ken Wilson's Early Concept of Effective Theory", *The Fourteenth Biennial Congress of the International Society for the History of Philosophy of Science (HOPOS 2022)*, UC Irvine, USA — June 2022

23. "Bottom-up EFTs and Model Independence: Some Historical Roots", *Beyond Models*, University of Bonn, Germany — June 2022

22. "How Theoretical Terms Effectively Refer", *Canadian Society for the History and Philosophy of Science (CSHPS) Annual Meeting*, Online — May 2022

21. "How Theoretical Terms Effectively Refer", Departmental Colloquium, IE University, Madrid, Spain — April 2022

20. "How to Think about Systems Across Scales", Munich Center for Mathematical Philosophy, LMU Munich, Online — March 2022

19. "Ken Wilson's Early Concept of Effective Theory", *The 20th European Conference on Foundations of Physics*, ENS Ulm, Paris, France — Oct. 2021

18. "Playing Physics Against Itself: Kenneth Wilson's Path to Effective Theories in the 1960s", *European Society for the History of Science (ESHS) Early Career Scholars Conference*, Online — Sep. 2021

17. "La Référence des Termes Théoriques à la Lumière des Théories Effectives", *Congrès de la Société de Philosophie des Sciences (SPS) 2021*, Université de Mons, Belgium — Sep. 2021

16. "Ken Wilson and the Slicing Method", *Approximation in Physics: Historical and Philosophical Perspectives*, MPIWG, Berlin, Germany — June 2021

15. "How Theoretical Terms Effectively Refer", Department of Philosophy, University of Notre Dame, South Bend, USA — Nov. 2019

14. "Two Cheers for Effective Theories and Selective Realism", *LARSIM seminar*, CEA, Paris, France — May 2019

13. "Two Cheers for Effective Theories and Selective Realism", *Workshop in Philosophy of Physics*, CCNY, New York, USA — May 2019

12. "Two Cheers for Effective Theories and Selective Realism", *Early Career Workshop in the History and Philosophy of Physics*, University of Pittsburgh, USA — April 2019

11. "Renormalization Scrutinized", *The 19th European Conference on Foundations of Physics*, Utrecht University, Netherlands — July 2018

10. "Renormalization Scrutinized", *The British Society for the Philosophy of Science (BSPS) Annual Conference*, Oxford, UK — July 2018

9. "Effective Theories and Infinite Idealizations", *Congrès de la Société de Philosophie Analytique (SOPHA)*, UCL, Louvain-la-Neuve, Belgium — July 2018

8. "Effective Theories and Infinite Idealizations", *Models and Simulations 8 (MS8) Annual Conference*, USC, Columbia, USA — March 2018

7. "Effective Theories and Infinite Idealizations", *The British Society for the Philosophy of Science (BSPS) Annual Conference*, Edinburgh, UK — July 2017

6. Commentary on Benjamin Henke's "Actual Difference Making, Causal Selection, and Ranking Explanations", *Society for the Metaphysics of Science Conference*, Fordham University, New York, USA — Oct. 2017

5. Commentary on Patricia Palacios's "Symmetry-Breaking Phase Transition: A Challenge for Reductionism?", *Symmetries and Asymmetries in Physics Conference*, Leibniz University Hannover, Germany — July 2017

4. "Who's Afraid of Infinities? Reduction and Singularities in Phase Transitions", *Infinite Idealizations in Science Conference*, Munich Center for Mathematical Philosophy, LMU Munich, Germany — July 2016

3. "The Origins of Loop-infinities in Quantum Field Theory", *Philosophy of Physics Talk Series*, Columbia University, New York, USA — Nov. 2014

2. "The Logic of Perturbative Renormalization", Center for Mathematical Science, University of Cambridge, UK — July 2014

1. "Are Virtual Particles Real?", History and Philosophy of Science Department, University of Cambridge, UK — May 2013

Teaching Experience

As Instructor at LMU Munich (all graduate)

Scientific Realism and Its Discontents [Syllabus]	Winter 23/24
Reduction and Emergence [Syllabus]	Winter 22/23

As Instructor at Columbia University (all undergraduate)

Contemporary Civilization, Moral & Political Philosophy [Syllabus]	Spring 2020
Contemporary Civilization, Moral & Political Philosophy [Syllabus]	Fall 2019
Contemporary Civilization, Moral & Political Philosophy	Spring 2019
Contemporary Civilization, Moral & Political Philosophy	Fall 2018
Early Modern Philosophy [Syllabus]	Summer 2018
Philosophy of Science [Syllabus]	Summer 2017

As Teaching Assistant at Columbia University (all undergraduate)

Symbolic Logic (Achille Varzi), Recitation Sections	Spring 2017
Metaphysics (Achille Varzi), Recitation Sections	Fall 2016
Physics and Philosophy (David Albert)	Spring 2016
Introduction to Philosophy (Cheryl Mendelson)	Fall 2015
History of Philosophy II: Aquinas to Kant (Patricia Kitcher), Recitation Sections	Spring 2015
Methods and Problems of Philosophical Thought (David Albert)	Fall 2014

Experience with supervision

Karla Weingarten, "Understanding with Feynman Diagrams", Master thesis, LMU Munich	2015 - 2020
Nikitas Koutoupes, "Quantum Suicide and Probability in the Many-Worlds Interpretation of Quantum Mechanics", Master student essay, Columbia University	2019 - 2020
Regular supervisions of undergraduate mid-term papers (5-10 pages) and final research essays (10-20 pages), Columbia University	2015 - 2020

Pedagogical Training

Seminar

Contemporary Civilization core preceptor pedagogical seminar	2018 - 2019

Workshops

"Inclusive Online Teaching" (Center for Teaching and Learning, CTL)	Spring 2020
"Teaching Remotely" (CTL)	Spring 2020
"Learning Through Discussion" (CTL)	Spring 2019
"Inclusive Teaching" (CTL)	Spring 2019
"Dealing with Difficult Topics in the Classroom" (Core Curriculum, CC)	Fall 2018
"Effectively Leading Classroom Discussions" (CC)	Fall 2018
"Grading and Assessment" (CC)	Fall 2018
"Inclusive Teaching" (CC)	Fall 2018
Micro-teaching and peer-observation sessions (CC)	Fall 2018
"Inclusive Teaching: Small Changes to Maximize Equity in the Classroom" (CTL)	Fall 2017
"Syllabus Design" (CTL)	Fall 2016
"Presentation Skills for Educators" (CTL)	Fall 2014

Physics Research

Laboratory for Theoretical Physics (LPT), Orsay, France Summer 2010
CP violation study of the channels $B_{s/d} \to l^+ l^-$ and $B^- \to l\overline{\nu}_l$ within the Standard Model and the two-Higgs-doublet model

Service

Conference and symposium organization

4. Symposium *Open and closed systems in quantum physics and cosmology*, EPSA, co-organizer — Sep. 2023

3. Symposium *Open and closed systems in quantum physics and cosmology*, Foundations, co-organizer — July 2023

2. Workshop on the future of the foundations of physics (17 invited speakers), Department of Physics & Department of Philosophy, Columbia University, co-organizer — Oct. 2018

1. Rutgers-Columbia workshop on the metaphysics of quantum field theories (8 invited speakers), Department of Philosophy, Rutgers University, co-organizer — May 2018

Professional service and outreach

Philosophy of Physics Reading Group organizer, LMU Munich — 2022 - present
Search committee, postdoctoral position in philosophy of science, LMU Munich — 2024
Reviewer for the fellowship program of the American Academy in Berlin — 2022
Interview with the science journalist Thomas Lewton for the magazine *New Scientist* (topic on the philosophy of effective theories) — Sep. 2022
Final Theory Group seminar co-organizer, MPIWG, Berlin — 2020 - 2022
James P. Shenton essay prize committee, Core Curriculum, Columbia University — March 2020
Facilitator for the philosophy outreach program *Rethink*, New York, USA — 2015 - 2016
Graduate Student Workshop organizer, Columbia University — 2015 - 2016
Graduate Student Representative, Columbia University — 2015 - 2016
Philosophy of Physics Reading Group founder and organizer, Columbia University — 2013 - 2015
Group leader for the science outreach program *La Main à la Pâte*, Paris, France — 2009 - 2010

Journal referee

Foundations of Physics, International Studies in the Philosophy of Science, Philosophical Studies, Philosophy of Science, Studies in History and Philosophy of Modern Physics, Studies in History and Philosophy of Science, Synthese, The British Journal for the Philosophy of Science, The European Physical Journal H

Program committee

21st European Conference on Foundations of Physics (2023), Columbia-NYU graduate conference (2014-2019), Princeton-Penn-Columbia history of philosophy graduate conference (2015)

Participation in research projects

Metascience (2013-2015, website), Historical Epistemology of the Final Theory Program (2018-present, website), The Universe as an Open System (2021-present, website)

Affiliations

British Society for Philosophy of Science, European Society for the History of Science, European Philosophy of Science Association, German Society for Philosophy of Science, Philosophy of Physics Society, Philosophy of Science Association, Société de Philosophie des Sciences

Languages

English (fluent), French (native), Spanish (B2), German (A2), Farsi (elementary)

References

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Jenann Ismael
William H. Miller III Professor
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Emmanuelle Saada (Teaching Reference)
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Teaching portfolio, writing samples, transcripts and further materials available upon request. Please email me at sebastien.rivat@lmu.de. Last updated: March 17, 2024