Karen Crowther

University of Geneva
Department of Philosophy
Rue de Candolle 2
1211 Geneva, Switzerland

http://karencrowther.space
karen.crowther@unige.ch

Specialisation Philosophy of physics; philosophy of science

Competence Metaphysics; philosophy of mathematics

Employment Postdoctoral Associate, Department of Philosophy, University of Geneva, 2016–2019
Postdoctoral Associate, Department of Philosophy, University of Pittsburgh, 2014

Education PhD in Philosophy, University of Sydney, 2015
BA. (Hons) in Philosophy (Minor: Theology), Monash University, 2009
BSc. (Hons) in Physics (Minor: Mathematics), Monash University, 2008
Exchange Student, Uppsala University, 2006
Visiting Student, University of Cambridge, 2012, 2013

PhD Thesis "Appearing out of nowhere: the emergence of spacetime in quantum gravity".
Supervisors: Huw Price and Dean Rickles.
Committee: Jonathan Bain, Eleanor Knox, and Christian Wüthrich.

Book Crowther, K. (2016) *Effective Spacetime: Understanding Emergence in Effective Field Theory and Quantum Gravity*, Springer.

Edited Issue Crowther, K. & Rickles, D., eds., (2014) "Special Issue on Principles of Quantum Gravity" in *Studies in History and Philosophy of Modern Physics*, 46, 135–227.

Journal Articles Crowther, K. (Forthcoming) "Inter-theory relations in quantum gravity: Correspondence, reduction and emergence", in *Studies in History and Philosophy of Modern Physics*, arXiv:1712.00473

Crowther, K. & Linnemann, N. (Forthcoming) "Renormalizability, fundamentality and a final theory: The role of UV-completion in the search for quantum gravity", in *The British Journal for the Philosophy of Science*, arXiv:1705.06777

Crowther, K. (2015) "Decoupling emergence and reduction in physics", in *European Journal for Philosophy of Science*, 5(3), 419–445.

Crowther, K. & Rickles, D. (2014) "Introduction: principles of quantum gravity" in *Studies in History and Philosophy of Modern Physics*, 46, 135–141.

Crowther, K. (2013) "Emergent spacetime according to effective field theory: from top-down and bottom-up" in *Studies in History and Philosophy of Modern Physics*, 44(3), 321–328.

Selected Presentations "Fundamentality and Emergence in Quantum Gravity"

- Spacetime: Fundamental or Emergent? Workshop (University of Bonn, October 2017)*

"What is the problem of quantum gravity?" (part of symposium *Towards a Methodology of Quantum Gravity*, organised by Keizo Matsubara)

- The European Philosophy of Science Association (EPSA) Conference (University of Exeter, September 2017)†

"Emergence as an inter-theory relation in quantum gravity" (part of symposium *The Metaphysics of Spacetime Emergence*, organised by Baptiste Le Bihan)

- European Congress of Analytic Philosophy (ECAP 9) Conference (Ludwig-Maximilians University of Munich, August 2017)†

"Understanding the emergence of spacetime from quantum gravity"

- Conference on the Philosophical Foundations of Quantum Gravity (University of Geneva and University of Illinois at Chicago, Geneva, June 2017)†

"Emergence, reduction, and correspondence in quantum gravity"

- Cosmology and the Future of Spacetime Conference (Western University, Ontario, June 2017)*

"On principles of theory construction and justification in quantum gravity" (with Niels Linnemann)

- European Congress of Analytic Philosophy (ECAP 9) Conference (Ludwig-Maximilians University of Munich, August 2017)†
- Reasoning in Physics Workshop (Ludwig-Maximilians University of Munich, December 2016)†

"The role of UV completion in the search for quantum gravity" (with Niels Linnemann)

- The British Society for the Philosophy of Science (BSPS) Annual Conference (Edinburgh, July 2017)†
- Metaphysics and Physics: Methodological Links Conference (University of Lausanne, November 2016)†

"Coming to terms with the breakdown of spacetime"

- International Summer Institute in Philosophy of Physics on the Philosophy of Quantum Gravity (Williams Bay, Wisconsin, June 2016)

"The Correspondence Principle in Quantum Gravity"

- Beyond Spacetime Seminar (University of Illinois at Chicago, April 2016)

"Decoupling emergence and reduction in physics"

- Effective Theories, Mixed Scale Modeling and Emergence Conference (University of Pittsburgh, October 2015)†

"Novelty and autonomy as alternatives to, or bases for, a conception of emergence in physics"

- Reduction and Emergence in the Sciences Conference (Munich Centre for Mathematical Philosophy, November 2013)†
- Serious Metaphysics Seminar (University of Cambridge, February 2013)

"Emergent spacetime in (condensed matter approaches to) quantum gravity"

- Philosophy of Science Seminar (Ludwig-Maximilians University of Munich, November 2013);
- HPS Research Presentation Day (University of Sydney, May 2012)

"Effective spacetime"

- Serious Metaphysics Seminar (University of Cambridge, October 2013)

"Comments on Oriti's 'Disappearance and emergence of space and time in quantum gravity'"

- Quantum Gravity in Perspective Conference (Munich Centre for Mathematical Philosophy, June 2013)†

"Effective field theory, emergence, and fundamental physics"

- Australasian Association of Philosophy Conference (University of Otago, July 2011)†

"Understanding effective field theory"

- Centre for Time Postgraduate Seminar (University of Sydney, June 2011)

"Spacetime emergent from a Bose-Einstein Condensate"

- Centre for Time Postgraduate Seminar (University of Sydney, August 2010)

*invited presentations †peer-reviewed

Awards

Swiss National Science Foundation Grant for Interdisciplinary Project (in collaboration with Christian Wüthrich (PI) and Niels Linnemann, University of Geneva) 2016
Visiting honorarium, Spacetime After Quantum Gravity Research Group, University of Illinois at Chicago 2015
Lucy Firth Publication Prize in Philosophy (Sydney) 2013
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Andrew Donald Campbell Memorial Prize (Sydney) 2010
Australian Postgraduate Award Scholarship (Sydney) 2010
Camo Jackson Prize for Honours in Philosophy (Monash) 2009
Faculty of Arts Honours Study Assistance Scholarship (Monash) 2009
Faculty of Arts Dean's Recognition Award (Monash) 2009
Golden Key International Honours Society Membership 2005

Professional Service

Committee/Assistant:

- The European Philosophy of Science Association (EPSA) Conference, University of Geneva, September 2019
- Spacetime Functionalism Workshop, University of Geneva, March 2018
- Conference on the Philosophical Foundations of Quantum Gravity, University of Geneva and University of Illinois at Chicago, June 2017
- Effective Theories, Mixed Scale Modeling and Emergence Conference, University of Pittsburgh, October 2015
- Free Will and Retrocausality in a Quantum World Conference, Trinity College, University of Cambridge, July 2014

Referee/Expert:

- *Philosophy of Science*
- *British Journal for Philosophy of Science*
- *European Journal for Philosophy of Science*
- *Studies in History and Philosophy of Modern Physics*
- The Fund for Scientific Research-FNRS (F.R.S.-FNRS) Brussels, Belgium

- Beyond Spacetime essay contest

Convener: Sydney Foundations of Physics Seminar Series, University of Sydney, 2011

Teaching Experience

Lecturer/Organiser:

- Philosophy of Physics Masters Seminar, University of Geneva, Fall 2017 (co-taught with Christian Wüthrich)

Practical Class Tutor/Laboratory Demonstrator:

- "Physics Simulations Using Microsoft Excel" for the Sutton Trust Summer School (Physics), University of Cambridge, July 2014
- "Mechanical Resonance" for the Sutton Trust Summer School (Physics), University of Cambridge, July 2014
- "Mechanical Resonance" for Experience Cambridge (Physics and Engineering), University of Cambridge, July 2014

Guest lectures:

- "Newton's Absolute Space" for Philosophy of Physics Masters Seminar, University of Geneva, November 2016
- "Time Travel for Beginners" for the Sutton Trust Summer School (Philosophy and Theology), University of Cambridge, July 2013
- "The Emergence of Spacetime in Quantum Theories of Gravity" for HPSC4101 *Philosophy of Physics*, University of Sydney, May 2011

Laboratory Demonstrator/Tutor
IA Physics
Cavendish Laboratory, University of Cambridge 2013

Class Tutor
PHIL1013 *Society, Knowledge and Self*
University of Sydney 2012; 2011

Laboratory Demonstrator
PHYS1011/PHYS1902/PHYS1003 *Junior Physics Laboratory*
University of Sydney 2012; 2011; 2010

Workshop Tutor
PHYS1003 *Physics 1 (Technological)*
University of Sydney 2010

Laboratory Demonstrator/Tutor
PHYS1011/PHYS1022 *Physics*
Monash University 2009; 2008