

Pierrick Bourrat

Curriculum Vitae

Macquarie University

Sydney, 2109 NSW

☎ (+61) 426400500

✉ p.bourrat@gmail.com

🌐 pierrickbourrat.com

AOS **Philosophy of Biology, Philosophy of Science, Evolutionary Biology.**

AOC **Philosophy of Cognitive Sciences, Evolutionary Psychology.**

Current Position

- 2021–present **Senior Lecturer & ARC DECRA Fellow**, *Philosophy department*, Macquarie University, Sydney, Australia.
- 2021–present **Associate Investigator**, *ARC Centre of Excellence in Synthetic Biology*, Sydney, Australia.
- 2017–present **Research Affiliate**, *Philosophy department & Charles Perkins Centre*, The University of Sydney.

Past Academic Employment

- 2017–2020 **Research Fellow**, *Philosophy department*, Macquarie University, Sydney, Australia.
- 2015–2017 **ARC Postdoctoral Research Associate & Associate Lecturer**, *Philosophy Department & History and Philosophy of Science Unit*, The University of Sydney, Australia.
- 2009–2010 **Research Assistant**, *Institute of Cognitive & Evolutionary Anthropology*, The University of Oxford.

Education

- 2011–2015 **PhD in Philosophy**, *The University of Sydney*.
- 2009 **MA in Philosophy of Science**, *University Paris 7*.
- 2006–2008 **MSc in Evolutionary Biology & Ecology**, *University of Montpellier*, France.
- 2006–2008 **BSc in Biology**, *University Blaise Pascal*, Clermont-Ferrand, France.

Language Skills

French Mother tongue

English Fluent

Computer skills

NetLogo, SPSS, R

Publications

(‘**’ indicates ‘equal first author’ and ‘†’ indicate ‘corresponding author’)

Monographs

- 1 **Bourrat, P.** (2021). *Facts, Conventions, and Levels of Selection*. Cambridge University Press.

Peer-Reviewed Journal Articles

- 60 **Bourrat, P.** (2025). “Reproducees, Reproducers, and Darwinian Individuals”. In: *Synthese* 205(2), p. 62. doi: 10 . 1007 / s11229-024-04880-w.
- 59 **Bourrat, P.** (2024). “Independence and the Levels of Selection”. In: *Philosophy, Theory, and Practice in Biology* 16(3). doi: 10 . 3998 / ptpbio . 5252.
- 58 **Bourrat, P.**[†], Takacs, P., Doulcier, G., Nitschke, M. C., Black, A. J., Hammerschmidt, K., Rainey, P. B., (2024). “Individuality Through Ecology: Rethinking the Evolution of Complex Life From an Externalist Perspective”. In: *Ecology and Evolution* 14(12), e70661. doi: 10 . 1002 / ece3 . 70661.
- 57 **Bourrat, P.**[†], Deaven, K., Villegas, C., (2024). “Evolvability: Filling the Explanatory Gap between Adaptedness and the Long-Term Mathematical Conception of Fitness”. In: *Biology & Philosophy* 39(4), p. 15. doi: 10 . 1007 / s10539-024-09951-3.
- 56 Doulcier, G., Takacs, P., Hammerschmidt, K., **Bourrat, P.**, (2024). “Stability of Ecologically Scaffolded Traits during Evolutionary Transitions in Individuality”. In: *Nature Communications* 15(1), p. 6566. doi: 10 . 1038 / s41467-024-50625-1.
- 55 Roberts, A. J., **Bourrat, P.**[†], (accepted). “Are Biology Experts and Novices Function Pluralists?” In: *Review of Philosophy and Psychology*. doi: 10 . 1007 / s13164-024-00733-0.
- 54 Takacs, P., **Bourrat, P.**, (2024). “Context Matters: A Response to Autzen and Okasha’s Reply to Takacs and Bourrat”. In: *Biological Theory* 19, pp. 170–176. doi: 10 . 1007 / s13752-024-00455-7.
- 53 **Bourrat, P.** (2024). “Adding Causality to the Information-Theoretic Perspective on Individuality”. In: *European Journal for Philosophy of Science* 14(1), p. 9. doi: 10 . 1007 / s13194-023-00566-1.
- 52 **Bourrat, P.** (forthcoming). “Moving Past Conventionalism about Multilevel Selection”. In: *Erkenntnis*. doi: 10 . 1007 / s10670-023-00749-5.
- 51 Doulcier, G., Takacs, P., **Bourrat, P.**, (2024). “Evolutionary Transitions in Individuality and Life Cycle Closure”. In: *Philosophy of Science* 91(5), pp. 1425–1434. doi: 10 . 1017 / psa . 2023 . 162.
- 50 Takacs, P., Doulcier, G., **Bourrat, P.**, (2024). “From Fitness-Centered to Trait-Centered Explanations: What Evolutionary Transitions in Individuality Teach Us about Fitness”. In: *Philosophy of Science* 91(5), pp. 1393–1403. doi: 10 . 1017 / psa . 2023 . 161.

- 49 **Bourrat, P.** (2022). "A New Set of Criteria for Units of Selection". In: *Biological Theory* 17(4), pp. 263–275. doi: 10.1007/s13752-022-00416-y.
- 48 Griffiths, P. E., **Bourrat, P.**, (2023). "Integrating Evolutionary, Developmental and Physiological mismatch". In: *Evolution, Medicine, and Public Health* 11(1), pp. 277–286. doi: 10.1093/emph/eoad023.
- 47 **Bourrat, P.** (2023). "Multilevel Selection 1, Multilevel Selection 2, and the Price Equation: A Reappraisal". In: *Synthese* 202(3), p. 72. doi: 10.1007/s11229-023-04285-1.
- 46 **Bourrat, P.** (2023). "A Coarse-Graining Account of Individuality: How the Emergence of Individuals Represents a Summary of Lower-Level Evolutionary Processes". In: *Biology & Philosophy* 38(4), p. 33. doi: 10.1007/s10539-023-09917-x.
- 45 **Bourrat, P.**, Godsoe, W., Pillai, P., Gouhier, T. C., Ulrich, W., Gotelli, N. J., van Veelen, M., (2023). "What Is the Price of Using the Price Equation in Ecology?" In: *Oikos* 2023(8), e10024. doi: 10.1111/oik.10024.
- 44 **Bourrat, P.** (2023). "A Pricean Formalization of Gaia". In: *Philosophy of Science* 90(3), pp. 704–720. doi: 10.1017/psa.2023.44.
- 43 Nitschke, M. C., Black, A. J., **Bourrat, P.**, Rainey, P. B., (2023). "The Effect of Bottleneck Size on Evolution in Nested Darwinian Populations". In: *Journal of Theoretical Biology*, p. 111414. doi: 10.1016/j.jtbi.2023.111414. (Visited on 01/17/2023).
- 42 **Bourrat, P.**, Doucier, G., Rose, C. J., Rainey, P. B., Hammerschmidt, K., (2022). "Tradeoff Breaking as a Model of Evolutionary Transitions in Individuality and Limits of the Fitness-Decoupling Metaphor". In: *eLife* 11, e73715. doi: 10.7554/eLife.73715.
- 41 Lu, Q., **Bourrat, P.**, (2022). "On the Causal Interpretation of Heritability from a Structural Causal Modeling Perspective". In: *Studies in History and Philosophy of Science* 94, pp. 87–98.
- 40 Christie, J. R., Brusse, C., **Bourrat, P.**[†], Takacs, P., Griffiths, P. E., (2022). "Let's Get to Work: A Response to Our Commentators". In: *Australasian Philosophical Review* 6(4), pp. 429–439. doi: 10.1080/24740500.2024.2370629.
- 39 Christie, J. R., Brusse, C., **Bourrat, P.**[†], Takacs, P., Griffiths, P. E., (2022). "Target Article: Are Biological Traits Explained by Their 'Selected Effect' Functions?" In: *Australasian Philosophical Review* 6(4), pp. 335–359.
- 38 **Bourrat, P.**, Charbonneau, M., (2022). "Grains of Description in Biological and Cultural Transmission". In: *Journal of Cognition and Culture* 22(2-4), pp. 185–202.
- 37 Takacs, P., **Bourrat, P.**, (2022). "The arithmetic mean of what? A Cautionary Tale about the Use of the Geometric Mean as a Measure of Fitness". In: *Biology and Philosophy* 11(4), p. 112.

- 36 **Bourrat, P.** (in press). “Evolutionary Transitions in Individuality by Endogenization of Scaffolded Properties”. In: *British Journal for the Philosophy of Science*.
- 35 **Bourrat, P.** (2022). “Unifying Heritability in Evolutionary Theory”. In: *Studies in History and Philosophy of Science* 91, pp. 201–210.
- 34 Takacs, P., **Bourrat, P.**, (2021). “Fitness: static or dynamic?” In: *European Journal for Philosophy of Science* 37(2), p. 12.
- 33 **Bourrat, P.** (2021). “Function, persistence, and selection: Generalizing the selected-effect account of function adequately”. In: *Studies in History and Philosophy of Science* 90, pp. 61–67.
- 32 **Bourrat, P.**, Griffiths, P., (2024). “The Idea of Mismatch in Evolutionary Medicine”. In: *British Journal for the Philosophy of Science* 74(4), pp. 921–946.
- 31 **Bourrat, P.** (2021). “Measuring Causal Invariance Formally”. In: *Entropy* 23(6), p. 690.
- 30 Charbonneau, M., **Bourrat, P.**, (2021). “Fidelity and the Grain Problem in Cultural Evolution”. In: *Synthese* 199(3-4), pp. 5815–5836.
- 29 Doulcier, G., Takacs, P., **Bourrat, P.**[†], (2021). “Taming Fitness: Organism-Environment Interdependencies Preclude Long-Term Fitness Forecasting”. In: *BioEssays* 4, p. 2000157.
- 28 Black, A. J., **Bourrat, P.**, Rainey, P. B., (2020). “Ecological scaffolding and the evolution of individuality during the transition from cells to multicellular life”. In: *Nature Ecology & Evolution* 4, pp. 426–436.
- 27 **Bourrat, P.** (2021). “Heritability, causal influence and locality”. In: *Synthese* 198(7), pp. 6689–6715.
- 26 **Bourrat, P.** (2020). “Causation and SNP Heritability”. In: *Philosophy of Science* 87(5), pp. 1073–1083.
- 25 **Bourrat, P.** (2021). “Evolutionary Transitions in Individuality: a formal analysis”. In: *Synthese* 198(5), pp. 3699–3731.
- 24 **Bourrat, P.** (2020). “Natural Selection and the Reference Grain Problem”. In: *Studies in History and Philosophy of Science Part A* 80, pp. 1–8.
- 23 **Bourrat, P.** (2019). “Evolution is about Populations, but its Causes are about Individuals”. In: *Biological Theory* 14(4), pp. 254–266.
- 22 **Bourrat, P.** (2019). “In What Sense Can There Be Evolution by Natural Selection without Perfect Inheritance?” In: *International Studies in the Philosophy of Science* 32(1), pp. 13–31.
- 21 **Bourrat, P.** (2019). “Evolutionary Transitions in Heritability and Individuality”. In: *Theory in Biosciences* 138(2), pp. 305–323.

- 20 **Bourrat, P.** (2019). "Variation of Information as a Measure of One-to-One Causal Specificity". In: *European Journal for Philosophy of Science* 9(1), p. 11.
- 19 **Bourrat, P.** (2019). "On Calcott's Permissive and Instructive Cause Distinction". In: *Biology & Philosophy* 34(1).
- 18 **Bourrat, P.** (2018). "Have Causal Claims About the Gut Microbiome Been Over-Hyped?" In: *BioEssays* 40(12), p. 1800178.
- 17 Lu, Q., **Bourrat, Pierrick**^{*†}, (2018). "The Evolutionary Gene and the Extended Evolutionary Synthesis". In: *The British Journal for the Philosophy of Science* 69(3), pp. 775–800.
- 16 **Bourrat, P.**, Griffiths, P. E., (2018). "Multispecies Individuals". In: *History and Philosophy of the Life Sciences* 40(2).
- 15 **Bourrat, P.** (2018). "Natural Selection and Drift as Individual-Level Causes of Evolution". In: *Acta Biotheoretica* 66(3), pp. 159–176.
- 14 Lynch, K. E., **Bourrat, Pierrick**^{*}, (2017). "Interpreting Heritability Causally". In: *Philosophy of Science* 84(1), pp. 14–34.
- 13 **Bourrat, Pierrick**[†], Lu, Q., Jablonka, E., (2017). "Why the Missing Heritability Might Not Be in the DNA". In: *BioEssays* 39(7).
- 12 **Bourrat, P.**, Lu, Q., (2017). "Dissolving the Missing Heritability Problem". In: *Philosophy of Science* 84(5), pp. 1055–1067.
- 11 **Bourrat, P.** (2017). "Explaining Drift from a Deterministic Setting". In: *Biological Theory* 12(1), pp. 27–38.
- 10 **Bourrat, P.** (2016). "Generalizing Contextual Analysis". In: *Acta Biotheoretica* 64(2), pp. 197–217.
- 9 **Bourrat, P.** (2015). "Levels, Time and Fitness in Evolutionary Transitions in Individuality". In: *Philosophy & Theory in Biology* 7.
- 8 **Bourrat, P.** (2015). "Levels of Selection Are Artefacts of Different Fitness Temporal Measures". In: *Ratio* 28(1), pp. 40–50.
- 7 **Bourrat, P.** (2015). "Distinguishing Natural Selection from Other Evolutionary Processes in the Evolution of Altruism". In: *Biological Theory* 10(4), pp. 311–321.
- 6 **Bourrat, P.** (2015). "How to Read 'Heritability' in the Recipe Approach to Natural Selection". In: *The British Journal for the Philosophy of Science* 66(4), pp. 883–903.
- 5 **Bourrat, P.** (2014). "From Survivors to Replicators: Evolution by Natural Selection Revisited". In: *Biology & Philosophy* 29(4), pp. 517–538.
- 4 Viciana, H., **Bourrat, P.**, (2011). "Is God an Adaptation? Essay Review on *The Evolution of God*, by Robert Wright". In: *Philosophia* 39(2), pp. 397–408.

- 3 Atkinson, Q. D., **Bourrat, Pierrick***, (2011). "Beliefs about God, the Afterlife and Morality Support the Role of Supernatural Policing in Human Cooperation". In: *Evolution and Human Behavior* 32(1), pp. 41–49.
- 2 **Bourrat, P.[†]**, Atkinson, Q. D., Dunbar, R. I., (2011). "Supernatural Punishment and Individual Social Compliance across Cultures". In: *Religion, Brain & Behavior* 1(2), pp. 119–134.
- 1 **Bourrat, P.[†]**, Baumard, N., McKay, R., (2011). "Surveillance Cues Enhance Moral Condemnation." In: *Evolutionary psychology: an international journal of evolutionary approaches to psychology and behavior* 9(2), pp. 193–199.

Book Chapters

- 7 **Bourrat, P.** (forthcoming). "Some Personal Reflexions on Lloyd's Contributions in the Units of Selection Debate". In: *Essays in Honor of Elisabeth Lloyd*.
- 6 **Bourrat, P.** (forthcoming). "In What Sense Can There Be Conflict Between the Levels of Selection?" In: *The Paradox of the Organism: Adaptation and Internal Conflict*. Ed. by J. Arvid Ågren and Manus M. Patten. Harvard University Press: Cambridge MA, pp. 32–52.
- 5 Doucier, G., Hammerschmidt, K., **Bourrat, P.[†]**, (2022). "Division of Labor and Fitness Decoupling in Evolutionary Transitions in Individuality". In: *The evolution of multicellularity*. Ed. by Matthew D. Herron, Peter L. Conlin, and William C. Ratcliff. CRC Press.
- 4 **Bourrat, P.[†]**, Viciana, H., (2016). "Supernatural Beliefs and the Evolution of Cooperation". In: *Oxford Handbook of the Evolutionary Perspectives on Religion*. Ed. by James Liddle and Todd K. Shackelford.
- 3 **Bourrat, P.** (2015). "Origins and evolution of religion from a Darwinian point of view: synthesis of different theories". en. In: *Handbook of Evolutionary Thinking in the Sciences*. Ed. by Thomas Heams, Philippe Huneman, Guillaume Lecointre, and Marc Silberstein. Springer Netherlands, pp. 761–780.
- 2 Duncan, M. J., **Bourrat, Pierrick***, DeBerardinis, J., O'Malley, M., (2013). "Small things, big consequences: Microbiological perspectives on biology". In: *The Philosophy of Biology*. Ed. by Kostas Kampourakis. Springer Netherlands, pp. 373–394.
- 1 **Bourrat, P.** (2011). "L'évolution de la religion d'un point de vue darwinien : synthèse des différentes théories". In: *Les Mondes Darwiniens*. Ed. by Thomas Heams, Philippe Huneman, Guillaume Lecointre, and Marc Silberstein. Éditions Matériologique, pp. 1125–1258.

Encyclopedia Entries

- 4 **Bourrat, P.** (2019). "Adaptations: Product of Evolution". en. In: ed. by Todd K. Shackelford and Viviana A. Weekes-Shackelford. *Encyclopedia of Evolutionary Psychological Science*, pp. 1–4.

- 3 **Bourrat, P.** (2019). “Genetic Relatedness”. en. In: ed. by Todd K. Shackelford and Viviana A. Weekes-Shackelford. *Encyclopedia of Evolutionary Psychological Science*, pp. 1–4. ISBN: 978-3-319-16999-6.
- 2 Wilkins, J. S., **Bourrat, P.**, (2018). “Replication and Reproduction”. In: ed. by Edward N. Zalta. Winter 2018. *The Stanford Encyclopedia of Philosophy*.
- 1 **Bourrat, P.** (2016). “Sélection Naturelle”. fr. In: ed. by Maxime Kristanek. *Encyclopédie Philosophique*.

Book Reviews

- 5 **Bourrat, P.** (2024). “Review of *Philosophy, History and Biology: Essays in Honour of Jean Gayon* edited by P.-O. Méthot.” In: *Philosophiques* 51(1), pp. 271–274. DOI: 10.7202/1117040ar.
- 4 **Bourrat, P.** (2024). “Review of *Biological Individuality. Cambridge Elements in the Philosophy of Biology* by Alison K. McConwell”. In: *The Quarterly Review of Biology* 99(4), pp. 233–233. DOI: 10.1086/733296.
- 3 **Bourrat, P.** (2021). “Review *Inheritance Systems and the Extended Evolutionary Synthesis* by Eva Jablonka and Marion Lamb”. In: *BJPS Review of Books*.
- 2 **Bourrat, P.** (2017). “Review of *Biological Individuality: Integrating Scientific, Philosophical, and Historical Perspectives*, by Scott Lidgard and Lynn K. Nyhart (eds.)” In: *Notre Dame Philosophical Reviews*.
- 1 **Bourrat, P.** (2017). “Review of *Evolution by Natural Selection: Confidence, Evidence and the Gap*, by Michaelis Michael”. In: *Australasian Journal of Philosophy* 95(4), pp. 816–819.

Commentaries

- 1 **Bourrat, P.** (2023). “When Local Causes Are More Explanatorily Useful”. In: *Behavioral and Brain Sciences* 46, e185. DOI: 10.1017/S0140525X22002072.

Other

- 1 **Bourrat, P.** (2011). “Testing more specific hypotheses and going beyond correlations in the origins and evolution of religious beliefs. Comment on Ara Norenzayan’s *Big Gods: How Religion Transformed Cooperation and Conflict*”. In: *International Cognition and Culture Institute*.

Talks

Referred

- 29 **Bourrat, P.** (2025) “Reproducees, Reproducers, and Darwinian Individuals”. ISHPSSB conference, Porto, Portugal
- 28 Lu, Q., **Bourrat, P.**, (2024) “Causal Specificity Three Ways”. PSA 2024, New Orleans, USA
- 27 **Bourrat, P.** (2023) “Individuality and Coarse-Graining”. ISHPSSB conference, Toronto, Canada

- 26 Takacs, P., **Bourrat, P.**, (2022) “The Spectrum of Adaptation”. ISEMPH 2022, Lisbon, Portugal
- 25 **Bourrat, P.** (2022) “The Role of Ecology in Evolutionary Transitions in Individuality”. PSA 2022, Pittsburgh, PA, USA
- 24 Charbonneau, M., **Bourrat, P.**, (2021) “Is Fidelity a Causal Concept?” Culture Conference 2021, Virtual Conference
- 23 Lu, Q., **Bourrat, P.**, (2021) “On Estimating Heritability in Light of Structural Causal Modeling”. Third Conference on Science and Philosophy for Young Scholars in China, Fudan University, Shanghai
- 22 **Bourrat, P.** (2021) “Group selection: Convention or Fact?” PSA meeting, Baltimore
- 21 Takacs, P., **Bourrat, P.**, (2021) “Fitness: Static or Dynamic?” PSA meeting, Baltimore
- 20 **Bourrat, P.** (2019) “Aggregativity & Evolutionary Transitions in Individuality”. ISHPSSB conference, Oslo
- 19 **Bourrat, P.** (2019) “Evolutionary Transitions in Individuality as Transitions in Functional Non-Aggregativity”. Evolution of Complex Life Conference, Atlanta
- 18 **Bourrat, P.** (2018) “Causation and SNP Heritability”. PSA Meeting, Seattle
- 17 **Bourrat, P.** (2018) “Challenges for a Price Approach to Evolutionary Transitions in Individuality”. AAP, Wellington, NZ
- 16 **Bourrat, P.** (2017) “Explaining Drift from a Deterministic Setting”. ISHPSSB conference, Sao Paulo
- 15 **Bourrat, P.** (2017) “Explaining Drift from a Deterministic Setting”. MuST 10, The University of Sydney
- 14 **Bourrat, P.**, Lu, Q., (2016) “Dissolving the Missing Heritability Problem”. PSA Meeting, Atlanta
- 13 **Bourrat, P.** (2016) “Questioning the Relevance of the Multilevel Selection 1 / Multilevel Selection 2 Distinction in Evolutionary Transitions in Individuality”. Philosophy of Biology in UK Conference, Bristol
- 12 **Bourrat, P.** (2016) “Challenging the Evidence for Species Selection and the Export-of-Fitness Model of Evolutionary Transitions in Individuality”. MuST 9, Munich
- 11 Lu, Q., **Bourrat, P.**, (2015) “The Evolutionary Gene and the “Extended Evolutionary Synthesis””. ISHPSSB Conference, Montréal, Canada
- 10 **Bourrat, P.** (2015) “Are Reproduction and Inheritance Necessary Conditions for, or Products of, Evolution by Natural Selection?” ISHPSSB Conference, Organised Session “Rethinking Reproduction”, Montréal, Canada

- 9 **Bourrat, P.** (2014) “Endogenizing Reproduction and Inheritance: An Agent-Based Modeling Approach”. Agent-Based Modeling in Philosophy Conference, Munich
- 8 **Bourrat, P.** (2014) “Heritability and the Concepts of “Gene” and “Environment””. AAP, Australian National University, Canberra
- 7 **Bourrat, P.**, Lu, Qiaoying, (2014) “Questioning the Role of Epigenetic Inheritance in Evolutionary Theory”. MuST 7, The University of Sydney
- 6 **Bourrat, P.** (2013) “Revisiting Fitness: Trait-Based Fitness”. ISHPSSB Conference, Montpellier, France
- 5 **Bourrat, P.** (2012) “Time and Fitness in Evolutionary Transitions in Individuality”. PSA Meeting, San Diego
- 4 **Bourrat, P.** (2012) “The Role of Heredity and Reproduction in Evolution by Natural Selection”. AAHPSSS Conference, The University of Sydney
- 3 **Bourrat, P.** (2012) “Evolution by Natural Selection and the Problem of Heritability”. AAP, Woollongong, Australia
- 2 **Bourrat, P.** (2009) “La Théorie Du Signal Coûteux Appliquée à La Religion : Difficultés Conceptuelles” (“Costly Signaling Applied to Religion: Conceptual Difficulties”). 3rd Congress of the Society of Philosophy of Science, Paris
- 1 Viciana, H., **Bourrat, P.**, (2009) “The Evolution of Cultural Cognition and the Baldwin Effect: Which Conditions Are Essential for Categorizing Effects?” Cognition, Montreal

Invited

- 32 **Bourrat, P.** (2024). *Evolvability: Filling the Explanatory Gap between Adaptedness and the Long-Term Mathematical Conception of Fitness*. Hong Kong University of Science and Technology.
- 31 **Bourrat, P.** (2024). *Evolvability: Filling the Explanatory Gap between Adaptedness and the Long-Term Mathematical Conception of Fitness*. Beijing.
- 30 **Bourrat, P.** (2023). *A Causal Information-Theoretic Perspective on Individuality*. Shanghai, China.
- 29 Takacs, P., **Bourrat, P.**, (2023). *New Directions in the Philosophy of Biological Fitness*. Sydney, Australia.
- 28 Lu, Q., **Bourrat, P.**, (2023). *Judea Pearl’s Formal Measurement of Causal Strength in Terms of the Probability of Necessity and Sufficiency (PNS) and Its Relation with Causal Specificity*. Sydney, Australia.
- 27 **Bourrat, P.**, Griffiths, P. E., (2023). *‘Mismatch’ in Evolutionary Medicine*. Sydney, Australia.
- 26 **Bourrat, P.** (2022). *In What Sense Can There Be Conflict between the Levels of Selection?* Georgetown University.

- 25 **Bourrat, P.** (2019). *Reflections on Natural Selection and Adaptation*. Cargèse, France.
- 24 **Bourrat, P.** (2020). *Causation and SNP Heritability*. Peking University (China).
- 23 **Bourrat, P.** (2020). *A New Statistical Partitioning of the Price Equation for Evolutionary Transitions in Individuality*. Tsinghua.
- 22 **Bourrat, P.**, Rose, C., (2019). *Making Sense of the Fitness-Decoupling Paradox in Evolutionary Transitions in Individuality*. Bordeaux, France.
- 21 **Bourrat, P.** (2019). *Making Sense of the Fitness-Decoupling Paradox in Evolutionary Transitions in Individuality*. Krakow, Poland.
- 20 **Bourrat, P.** (2019) "Causation and SNP Heritability". Genetics and Human Agency Annual Meeting, Charlottesville, Virginia
- 19 **Bourrat, P.** (2019) "Aggregativity and Evolutionary Transitions in Individuality". MPI for Evolutionary Biology, Plön
- 18 **Bourrat, P.** (2018) "Solving the Fitness-Decoupling Paradox in Evolutionary Transitions in Individuality". MPI for Evolutionary Biology, Plön
- 17 **Bourrat, P.** (2017) "Revisiting the Unit of Selection Problem". New Directions in the Origins and Maintenance of Individuality, Macquarie University, Australia
- 16 **Bourrat, P.** (2017) "Explaining Drift from a Deterministic Setting". Philosophy Work in Progress Seminar, Macquarie University, Australia
- 15 **Bourrat, P.** (2016) "Evolution by Natural Selection and the Price Equation". Sun Yat-sen University, Guangzhou, China
- 14 **Bourrat, P.** (2016) "Costly Signalling Theory Applied to Religion: An Example of Conceptual Difficulty in the Transition from the Use of Evolutionary-Biology Tools to Cultural Evolution". Sun Yat-sen University, Guangzhou, China
- 13 **Bourrat, P.** (2016) "Questioning the Relevance of the Multilevel Selection 1 / Multilevel Selection 2 Distinction in Evolutionary Transitions in Individuality". All Souls College, Oxford
- 12 Lu, Q., **Bourrat, P.**, (2015) "Epigenetic Inheritance and the Evolutionary Gene". Beijing Normal University
- 11 Lu, Q., **Bourrat, P.**, (2015) "Epigenetic Inheritance and the Evolutionary Gene". Lingnan University, Hong Kong
- 10 **Bourrat, P.** (2014) "Two Kinds of Drift: Deterministic and Probabilistic Drift". S-ANU Philosophy of Biology Meeting, Sydney
- 9 **Bourrat, P.** (2014) "Reconceptualising Evolution by Natural Selection". Philosophy Work in Progress Seminar, The University of Sydney

- 8 **Bourrat, P.** (2014) "A Superior Multilevel Causal Decomposition to Contextual and Neighbour Partitionings". S-ANU Philosophy of Biology Meeting, Sydney
- 7 **Bourrat, P.** (2013) "Distinguishing the Evolution of Altruism from the Evolution of Altruism by Natural Selection". S-ANU Philosophy of Biology Meeting, Sydney
- 6 **Bourrat, P.** (2012) "Two New Meanings of the Concept of Heritability and a Unified Conception of Evolution by Natural Selection". S-ANU Philosophy of Biology Meeting, Bundanoon, Australia
- 5 **Bourrat, P.** (2012) "Levels, Time and Fitness in Evolutionary Transitions in Individuality". PBDB 6, Moruya Heads, Australia
- 4 **Bourrat, P.** (2012) "Mechanisms of Natural Selection". S-ANU Philosophy of Biology Meeting, Sydney
- 3 **Bourrat, P.** (2012) "Natural Selection and the Problem of Heritability". IHPST, Paris
- 2 Atkinson, Q. D., **Bourrat, P.**, Whitehouse, H., (2010) "Cross-Cultural Variation in Religious Belief and Practice." Cognition, Religion and Theology Project Conference, Merton College, Oxford
- 1 **Bourrat, P.** (2009) "Naturaliser La Religion à l'aide de Théories Darwiniennes : Quelques Enjeux Philosophiques Majeurs" ("Naturalizing Religion with Darwinian Theories: Some Major Philosophical Issues"). Workshop: New Paradigms in Ecology, Cargèse, France

Posters

- 6 **Bourrat, P.** (2018) "A Version of the Price Equation for Evolutionary Transitions in Individuality". Evolutionary Emergence of Life Cycles Workshop, MPI for Evolutionary Biology, Plön
- 5 Rainey, P., Doulcier, G., **Bourrat, P.**, (2017) "Ecology-Driven Transitions in Individuality". PSL OCAV Meeting, Paris
- 4 **Bourrat, P.**, Atkinson, Q., (2010) "Supernatural Policing and Human Cooperation". 20th International Association for the History of Religions Quinquennial World Congress, Toronto, Canada
- 3 **Bourrat, P.**, Atkinson, Q., (2010) "Individuals' Beliefs about God and the Afterlife Support the Importance of Supernatural Punishment in Human Cooperation". European Human Behavior & Evolution Association Conference, Wroclaw, Poland
- 2 **Bourrat, P.** (2009) "Qu'est-Ce Qu'est Vraiment La Sélection de Groupe Aujourd'hui ("What Is Group Selection Nowadays")". Darwin: Entre Sciences et Humanités, Paris
- 1 **Bourrat, P.**, Tofalvy, T., Viciana, H., (2008) "Adaptive Models of Religious Forms: Framing the Controversy on Cultural Group Selection". Academy of Sciences, New York. Values and Empathy across Social Barriers: A Neurocognitive Approach to Fairness, Barcelona, Barcelona

Teaching Experience

Course Coordinator

- 2022 **“Conceptual issues on levels and units of selections”**, *Tsinghua University*, Main instructor for the Tsinghua summer school in History and Philosophy of Life Sciences, Five days intensive course.
- 2020 **PHIL7001 “Research Topics in Philosophy II”**, *postgraduate course*, Macquarie University.
- 2020 **PHIL2032 “Science, Objectivity, and Reality”**, Macquarie University.
- 2020 **PHIL2049 “Evolution, Mind and Culture”**, Macquarie University.
- March 2016 **Intensive course on philosophy of biology**, Ludwig-Maximilians-Universität München (LMU Munich).
- 2015–2016 **HPSC2101 & HPSC2901 “What is this Thing Called Science”**, The University of Sydney, Introduction to philosophy of science, approx. 250 students.
- 2019 **PHIL2677 How Biology Matters to Philosophy**, *Guest Lecturer for 2 weeks*, The University of Sydney.
- 2017 **PHL 363 Philosophy and Cognitive Science: An Introduction**, *Guest Lecturer for 2 weeks*, Macquarie University.

Tutor

- 2020 **PHIL1031 “The Philosophy of Human Nature”**, Macquarie University.
- 2015 **HPSC2901 “What is this Thing Called Science”**, The University of Sydney.
- 2014 **PHIL2627 “Philosophy and Psychiatry”**, The University of Sydney.
- 2012 **PHIL2627 “Philosophy and Psychiatry”**, The University of Sydney.

Supervision

Students

- 2025-2026 **Xingyi Li**, *visiting PhD Student from Fudan University supported by the Chinese Scholarship Council (CS)*.
- 2025-2026 **Cunmin Chen**, *Masters Student*, Macquarie University, Associate Supervisor.
- 2025–present **Kangqiao Wang**, *PhD Student*, Macquarie University, Main Supervisor.
- 2014–2015 **Qiaoying Lu**, *PhD Student*, Sun Yat-Sen University, Guangzhou, China, now Assistant Professor at Peking University, Beijing, China.
- 2018 **Yajuan Li**, *PhD Student*, Beijing Normal University, Now Lecturer at Tianjin Chengjian University.
- 2018–2019 **Ying Liu**, *PhD Student*, The University of Sydney, Associate Supervisor. now postdoctoral fellow at the Chinese Academy of Sciences

Postdocs

- 2024 **Riin Kõiv**, *visiting postdoctoral research fellow supported by the Estonian Research Council*.
- 2024–present **Dr Peter Takacs**, *Postdoctoral Research Fellow*, Macquarie University.
- 2018–2020 **Dr Carl Brusse**, *Research Associate*, The University of Sydney.

2020–2024 **Dr Guilhem Doulcier**, *Research Associate*, Macquarie University.

2022–2023 **Dr Andrew Roberts**, *Research Associate*, Macquarie University.

Professional Experience

Visiting Researcher

2025 **University of Washington**, *Department of Biology*.

2016, 2018, 2019 **Ecole Supérieure de Physique et Chimie Industrielle de Paris (ESPCI Paris-Tech)**, *Laboratoire de Génétique de l'Evolution*.

2018, 2019, 2022 **Max Plank Institute for Evolutionary Biology**.

Visiting Student

2014 **University of Auckland, New Zealand**, *Advisors: Quentin Atkinson, Russell Gray*.

2014 **Massey University, New Zealand**, *Advisors: Paul Rainey, Katrin Hammerschmidt*.

2012 **City University of New-York**, *Advisor: Peter Godfrey-Smith*.

2011 **Australian National University**.

Consulting

2015– **Member of the Advisory Board for the Simulating Religion Project**, *led by Wesley J. Wildman, Saikou Y. Diallo, and F. LeRon Shults*, Institute for the Bio-Cultural Study of Religion.

Workshop/conference organisation

2024 **Evolving Individuality**, *Macquarie University*, Co-organised with Graham Thomas.

2023 **Sino-Australian Philosophy of Life Sciences Network inaugural workshop**, *The University of Sydney and Macquarie University*, Co-organised with Paul Griffiths.

2023 **Evolutionary Transitions in Individuality workshop**, *Max Plank Institute for Evolutionary Biology*, Co-organised with Guilhem Doulcier, Katrin Hammerschmidt, and Paul rainey.

2017 **New Directions in the Emergence and Maintenance of Individuality**, *Macquarie University*.

2015 **Modelling Non-Paradigmatic Evolutionary Processes**, *The University of Sydney*.

2012, 2014 **Organisation of the Sydney-Australian National University (S-ANU) workshop on philosophy of biology**, *The University of Sydney*.

2012 **Organisation of a publication course for postgraduate students**, *The University of Sydney*, Philosophy Department.

Leadership

2024–present **Head of the Theory and Method in Biosciences group**.

2023–present	Founding member of the Sino-Australian Philosophy of Life Sciences Network.
2020–2024	Co-Head of the Theory and Method in Biosciences group. Program Committee
2021	Sixth Annual Conference of the Society for the Metaphysics of Science
2022	Seventh Annual Conference of the Society for the Metaphysics of Science Journal Editor
2021–present	Associate Editor , <i>British Journal for the Philosophy of Science</i> . Reviewer
Grant Proposal	<i>Wellcome Trust USA National Science Foundation, Australian Research Council, National Science Center, Poland, Social Sciences and Humanities Research Council of Canada</i>
Book proposals	<i>Cambridge University Press, Oxford University Press, Routledge</i>
Philosophy Journals	<i>Philosophical Studies, Australasian Journal of Philosophy, The British Journal for the Philosophy of Science, Philosophy of Science, European Journal for Philosophy of Science, Biology & Philosophy, Synthese, Erkenntnis, Studies in History and Philosophy of Science Part A, Studies in History and Philosophy of Science Part C, International Studies in the Philosophy of Science, Review of Philosophy and Psychology, Biological Theory, Dialogue, History and Philosophy of the Life Sciences, Evolutionary Studies in Imaginative Culture, Kairos, Philosophy, Theory, and Practice in Biology</i>
Scientific Journals	<i>Nature, Journal of Molecular Evolution, Developmental Psychology, PNAS, eLife, Nature Human Behaviour, Journal of Personality and Social Psychology: Attitudes and Social Cognition, Biological reviews, Microbiome, Journal of Theoretical Biology, BMC Evolutionary Biology, Evolution and Human Behavior, Functional Ecology, F1000, BioSystems, Biological Journal of the Linnean Society, Comptes Rendus Biologies, Human Genetics, PLOS ONE, Studies in Religion Journal of Cognition and Culture</i>

Grants/Awards

2009	Religion, Cognition and Theology Small Grant , <i>University of Oxford & John Templeton Foundation</i> , Principal investigator for the project “Testing the Fear of Supernatural Punishment Hypothesis”, £ 13,690.
2011–2014	University of Sydney International Scholarship (USydis) , ~A\$200,000 for tuition fees and maintenance scholarship.
2011–2014	Top-up Scholarship , <i>The University of Sydney</i> , Australian Research Council’s Discovery Projects funding scheme DP0878650, ~A\$17,500.
2011	Lucy Firth publication prize, Semester 2 , <i>The University of Sydney</i> , A\$1,000.
2012	Lucy Firth publication prize, Semester 1 , <i>The University of Sydney</i> , A\$1,000.
2012	Postgraduate Research Support grant 2012 , <i>The University of Sydney</i> , School of Philosophical and Historical Inquiry, A\$3,000.

- 2012 **Doctoral Travel Grant 2013**, *The University of Sydney*, Faculty of Arts and Social Sciences, A\$3,000.
- 2012 **Lucy Firth publication prize, Semester 2**, *The University of Sydney*, A\$1,000.
- 2013 **Postgraduate Research Support grant 2013**, *The University of Sydney*, School of Philosophical and Historical Inquiry, A\$2700.
- 2013 **Travel Scholarship**, *International Society for History, Philosophy and Social Studies of Biology (ISHPSSB)*, US\$750.
- 2013 **Lucy Firth publication prize, Semester 1**, *The University of Sydney*, A\$1,000.
- 2013 **Lucy Firth publication prize, Semester 2**, *The University of Sydney*, A\$1,000.
- 2014 **Lucy Firth publication prize, Semester 1**, *The University of Sydney*, A\$1,000.
- 2014 **Postgraduate Research Support grant 2014**, *The University of Sydney*, School of Philosophical and Historical Inquiry, A\$821.
- 2014 **Lucy Firth publication prize, Semester 2**, *The University of Sydney*, A\$1,000.
- 2015 **Conference Travel grant 2015**, *The University of Sydney*, School of Philosophical and Historical Inquiry, A\$2,990.
- 2016 **Mobility grant**, *Erasmus+ Initiative*, European Union and LMU, ~€ 3,000.
- 2016 **Supplementary Funds**, *The University of Sydney*, School of Philosophical and Historical Inquiry, A\$5000.
- 2017 **Macquarie University Research Fellowship**, ~A\$350,000.
- 2017 **Research Travel grant 2015**, *Macquarie University*, Faculty of Arts, A\$4,040.
- 2017 **Research Grant**, *Macquarie University*, Centre for Agency and Value and Ethics, A\$3,000.
- 2017 **Research Grant**, *The University of Sydney*, Sydney Centre for the Foundations of Science, A\$4000.
- 2017 **Macquarie University Early Career Researcher of the Year**, *Category–Humanities, Business and Social Sciences*, Honourable Mention.
- 2018-2021 **Large Grant**, *John Templeton Foundation*, Co-Leader for the project “Constructing Objective Biological Criteria of Health” with Project Leader Paul Griffiths, ~A\$800,000.
- 2019 **Travel Award**, *Georgia Institute of Technology*, for the “Evolution of Complex life Conference”, ~A\$350.
- 2020 **Publication Subsidy Scheme**, *Macquarie University*, Faculty of Arts, A\$2,000.
- 2020 **Discovery Early Career Research Award (DECRA)**, *Australian Research Council (ARC)*, for the project “Inheritance and the Emergence of Individuals: From Concepts to Practice”, A\$441,200.
- 2021 **Research Grant**, *John Templeton Foundation*, Principal Investigator for the project “Evolutionary transitions in individuality: from ecology to teleonomy” with Katrin Hammerschmidt and Peter Takacs as part of the Cohort Program “Agency, Directionality, and Function”, A\$723,988.

- 2024 **Research Grant**, *Macquarie University*, Ethics & Agency Centre, funding to organise the 2024 SAPoLSN international summer school and workshop.
A\$5,000
- 2024 **Research Grant**, *Macquarie University*, Mind and Intelligence Initiative, funding to organise the 2024 SAPoLSN international summer school and workshop.
A\$5,000
- 2024-2027 **Funding**, *Macquarie University*, DVCR & Faculty of Arts, funding to organise the 2024 SAPoLSNS international summer school and workshop.
A\$30,000
- 2024 **Large Grant**, *John Templeton Foundation*, Principal Investigator for the project “Cognition All the Way Up?” with Andrew Barron and Paul Griffiths, A\$1,007,000.
- 2025 **Large Grant**, *John Templeton Foundation*, Investigator in the project “Does Earth’s habitability for life exist due to or in spite of Darwinian evolution by natural selection?” led by Richard Boyle from the University of Exeter (UK), £450,518.
- 2026 **Discovery Project**, *Australian Research Council (ARC)*, Lead Chief Investigator for the project “Health, Biological Fitness and Environmental Diversity” with Paul Griffiths (CI), CI David Raubeinheimer (CI), Cynthia Beal (PI), Charles Pence (PI), A\$600,146.

Public Outreach

- 2011 **The Good God Guide**, *The Economist*.
- 2012 **Why one look will put the fear of god into you**, *The Sydney Morning Herald*.
- 2013 **Religiosity about reproduction more than cooperation**, *The Conversation*.

Memberships

Philosophy of Science Association
International Society for History, Philosophy, and Social Studies of Biology
Australasian Association of Philosophy

References

upon request

Last updated: November 1, 2025