OFFICIAL JOURNAL OF THE PHILOSOPHY OF SCIENCE ASSOCIATION

PHILOSOPHY OF SCIENCE

PROCEEDINGS OF THE 2022 BIENNIAL MEETING
OF THE PHILOSOPHY OF SCIENCE ASSOCIATION
VOLUME 91, NUMBER 5

Part II
Symposia Papers
Edited by
Holly K. Andersen

PSA22

CAMBRIDGE UNIVERSITY PRESS
https://doi.org/10.1017/psa.2024.58 Published online by Cambridge University Press

Journal of the Philosophy of Science Association

Philosophy of Science

Editorial Board:

James Owen Weatherall, Editor-in-Chief
H. K. Andersen, Kenny Easwaran, Kevin Elliott, Doreen Fraser, Marta Halina, Kareem Khalifa, Alan C. Love, Angela Potochnik, Hannah Rubin, and Charlotte Werndl, Associate Editors

Jason McKenzie Alexander
Anna Alexandrova
Colin Allen
Jeffrey Barrett
Robert Batterman
William Bechtel
Gordon Belot
Katherine Brading
Richard Bradley
Matthew Brown
Justin Bruner
Cameron Buckner
Craig Callender
Nancy Cartwright
Mazviita Chirimuuta
Heather Douglas
Stephen Downes
Manuela Fernández Pinto
Samuel Fletcher
Mathias Frisch
Alan Hájek
Stephan Hartmann
Geoffrey Hellman
Don Howard
Nick Huggett
Simon Huttegger
James Joyce
Marc Lange
Sabina Leonelli
Chuang Liu
Helen Longino
Edouard Machery
Jane Maienschein
Conor Mayo-Wilson
Inmaculada de Melo-Martín
Roberta Millstein
Sandra Mitchell
Teru Miyake
Robert Northcott
John Norton
Cailin O'Connor
David Papineau
Wendy Parker
Anya Plutynski
Thomas Polger
Julian Reiss
Alan Richardson
Sarah Robins
Jan-Willem Romeijn
Alex Rosenberg
Adina Roskies
Lauren Ross
Laura Ruetsche
Rose-Mary Sargent
Brian Skyrms
Chris Smeenk
Miriam Solomon
Mark Sprevak
P. Kyle Stanford
Katie Steele
Jacob Stegenga
Paul Teller
Derek Turner
Jos Uffink
David Wallace
C. Kenneth Waters
Marcel Weber
Rob Wilson
James Woodward
Julie Zahle
Kevin Zollman

Managing Editor: Margaret E. Farrell

Governing Board of the Association

President: Michela Massimi, University of Edinburgh
President Elect: Craig Callender, University of California, San Diego
Past President: John Dupré, University of Exeter
Treasurer: Kevin Zollman, Carnegie Mellon University
Secretary: Chris Haufe, Case Western Reserve University

Mathias Frisch
Lydia Patton
Anya Plutynski
Stéphanie Ruphy
Jutta Schickore
Jacqueline Sullivan
Jonathan Tsou
James Owen Weatherall

Executive Director: Max Cormendy

https://doi.org/10.1017/psa.2024.58 Published online by Cambridge University Press

Volume 91 • Number 5 • December 2024

Philosophy of Science

Contents

1041 *Preface*
HOLLY K. ANDERSEN

1043 *The Disunity of Science and the Unity of the World Presidential Address, PSA 2022*
JOHN DUPRÉ

Symposia Papers

1058 *Strategic Constraints on Interacting Fields: Quantum Chemistry and Organic Chemistry*
WILLIAM GOODWIN

1068 *Causal Constraints in the Life and Social Sciences*
LAUREN N. ROSS

1078 *On the Role of Erotetic Constraints in Noncausal Explanations*
DANIEL KOSTIĆ

1089 *The Insufficiency of Statistics for Detecting Racial Discrimination by Police*
NAFTALI WEINBERGER

1098 *Causal Agnosticism About Race: Variable Selection Problems in Causal Inference*
ALEXANDER WILLIAMS TOLBERT

1109 *Exploratory Analysis and the Expected Value of Experimentation*
COLIN KLEIN

1118 *Rethinking the Conceptual Space for Science in Society after the VFI*
T. Y. BRANCH AND HEATHER DOUGLAS

1128 *How to Not Secure Public Trust in Science: Representative Values Versus Polarization and Marginalization*
SOAZIG LE BIHAN

1139 *Pandemic science and commercial values: An institutional account of values in science*
MANUELA FERNÁNDEZ PINTO

1149 *Structuring Institutions for Responsible and Accountable Science*
HEATHER DOUGLAS

1159 *Organizations and Values in Science and Technology*
JUSTIN B. BIDDLE

1169 *Minority Reports: Registering Dissent in Science*
HAIXIN DANG

1179 *Social Dynamics and the Evolution of Disciplines*
KEKOA WONG AND HANNAH RUBIN

1189 *Better than Best: Epistemic Landscapes and Diversity of Practice in Science*
JINGYI WU

https://doi.org/10.1017/psa.2024.58 Published online by Cambridge University Press

1199 *Structural Microaggressions for Explaining Outcome Gaps*
Mikio Akagi
1210 *Against Defending Science: Asking Better Questions About Indigenous Knowledge and Science*
Emily C. Parke and Daniel Hikuroa
1221 *Transdisciplinary Philosophy of Science: Meeting the Challenge of Indigenous Expertise*
David Ludwig, Charbel N. El-Hani, Fabio Gatti, Catherine Kendig, Matthias Kramm, Lucia Neco, Abigail Nieves Delgado, Luana Poliseli, Vitor Renck, Adriana Ressiore C., Luis Reyes Galindo, Thomas Lloyd Rickard, Gabriela De La Rosa, Julia J. Turska, Francisco Vergara-Silva and Robert A. Wilson
1232 *Dark Energy or Modified Gravity?*
Chris Smeenk and James Owen Weatherall
1242 *Equivalence and Convention*
Neil Dewar
1251 *Against Quantitative Primitivism*
Zee R. Perry
1262 *Torsion in the Classical Spacetime Context*
Helen Meskhidze and James Owen Weatherall
1274 *The Conventionality of Real-Valued Quantities*
Marissa Bennett and Michael E. Miller
1285 *Toward a new phase of Du Châtelet scholarship: From Institutions de Physique* (1740) *to Institutions Physiques* (1742)
Qiu Lin
1296 *Hume's Externalist Gambit*
Hayley Clatterbuck
1306 *Resolving Debates about Scientific Realism: The Challenge from Stances*
Anjan Chakravartty
1316 *Navigating in the Dark*
Amélie Godard Palluet and Marie Gueguen
1327 *A New Heuristic for Climate Adaptation*
Kate Nicole Hoffman and Karen Kovaka
1338 *Is Data Science Transforming Biomedical Research? Evidence, Expertise, and Experiments in COVID-19 Science*
Sabina Leonelli
1349 *Concepts of Actionability in Precision Oncology*
Benjamin Chin-Yee and Anya Plutynski
1361 *What is the Replication Crisis a Crisis Of?*
Uljana Feest
1372 *The Psychologist's Green Thumb*
Sophia Crüwell
1382 *Where memory resides: Is there a rivalry between molecular and synaptic models of memory?*
David Colaço and Jonathan Najenson
1393 *Evolutionary Transitions in Individuality and Life Cycle Closure*
Guilhem Doulcier, Peter Takacs and Pierrick Bourrat
1404 *Modeling Scaffolded Development into the Adjacent Possible Environment*
James Griesemer
1415 *The Coevolution of Descriptive and Evaluative Beliefs in Aldo Leopold's Thinking*
Roberta L. Millstein
1425 *From Fitness-Centered to Trait-Centered Explanations: What Evolutionary Transitions in Individuality Teach Us About Fitness*
Peter Takacs, Guilhem Doulcier and Pierrick Bourrat

https://doi.org/10.1017/psa.2024.58 Published online by Cambridge University Press

1435 *Goal Directedness and the Field Concept*
Gunnar Babcock and Daniel W. McShea
1445 *Do Machine Learning Models Represent Their Targets?*
Emily Sullivan
1456 *The Propositional Account of Effective Theories*
Isaac Wilhelm
1467 *Path-Dependence in Measurement: A Problem for Coherentism*
Morgan Thompson
1478 *The Representational Role of Sophisticated Theories*
Clara Bradley
1488 *An Exploration of Parameter Duality in Statistical Inference*
Suzanne Thornton and Minge Xie
1498 *Bamboozled by Bonferroni*
Conor Mayo-Wilson

https://doi.org/10.1017/psa.2024.58 Published online by Cambridge University Press

Philosophy of Science (ISSN 0031-8248) is published January, April, July, October, and December by Cambridge University Press, One Liberty Plaza, New York, NY 10006, USA/Cambridge University Press, University Printing House, Shaftesbury Road, Cambridge CB2 8BS, UK.

Periodicals postage paid a New York, NY, and at additional mailing points.

Postmaster: Send address changes in the USA, Canada, and Mexico to *Philosophy of Science*, Cambridge University Press, Journals Fulfillment Department, One Liberty Plaza, 20th floor, New York, NY 10006. Send address changes elsewhere to *Philosophy of Science*, Cambridge University Press, Journals Fulfillment Department, UPH, Shaftesbury Road, Cambridge CB2 8BS, England.

Membership and Subscription Rates
Individual members of the PSA receive a subscription to the journal. Membership rates for 2024 are tiered based on income and start at $36 print + electronic, $27 e-only. To join the PSA visit: https://philsci.org/membership.php. Institutional print + electronic and e-only subscription rates are tiered according to an institution's type and research output: £261/$363 to £534/$738 print + electronic, £202/$280 to £405/$561 e-only. Institutional print-only is £295/$405. Additional taxes may apply. Free or deeply discounted access is available for many institutions through Cambridge University Press's developing world country programme: https://www.cambridge.org/core/services/librarians/developing-country-programme. For additional rates, and any other subscription queries, please contact: journals@cambridge.org.

Copying Beyond Fair Use
Articles may be copied or otherwise reused without permission only to the extent permitted by Sections 107 and 108 of the US Copyright Law. Permission to copy articles for personal, internal, classroom, or library use may be obtained from the Copyright Clearance Center (http://www.copyright.com/). For all other uses, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale, please contact permissions@cambridge.org. Articles in the public domain may be used without permission, but it is customary to contact the author.

Articles appearing in *Philosophy of Science* are abstracted or indexed in Arts and Humanities Citation Index, Biological Abstracts, Bulletin Signalétique 519, Current Contents/Arts and Humanities, Current Contents/Social and Behavioral Sciences, Current Index to Statistics, Humanities Index, Index to Book Reviews in the Humanities, Isis Critical Bibliography, Language & Language Behavior Abstracts, Mathematical Reviews, Philosopher's Index, Philosophic, Psychological Abstracts, Repertoire Bibliographique de la Philosophie, Social Sciences Citation Index, Sociological Abstracts.

© 2024 by Philosophy of Science Association. All rights reserved.

Printed by Sheridan, a CJK Group Company.

https://doi.org/10.1017/psa.2024.58 Published online by Cambridge University Press