# Philosophy of Science

#### **Editorial Board:** Andrea Woody, Editor-in-Chief Kevin Elliott, Alan C. Love, Angela Potochnik, Katie Steele, James Owen Weatherall, and Charlotte Werndl, Associate Editors Jason McKenzie Alan Hájek Alan Richardson Alexander Stephan Hartmann Alex Rosenberg Anna Alexandrova Geoffrey Hellman Laura Ruetsche Don Howard Jeff Barrett **Rose-Mary Sargent** Kristin Shrader-Frechette Robert Batterman Nick Huggett William Bechtel Marc Lange Lawrence Sklar Gordon Belot Helen Longino Brian Skyrms Jane Maienschein Chris Smeenk Cristina Bicchieri Katherine Brading Michela Massimi Miriam Solomon Roberta Millstein P. Kyle Stanford Richard Bradley Paul Teller Craig Callender Sandra Mitchell Nancy Cartwright Mary Morgan Derek Turner Lindley Darden Wayne Myrvold Jos Uffink Michael Dickson John Norton David Wallace Stephen Downes Samir Okasha C. Kenneth Waters David Papineau Marcel Weber John Dupré Kenny Easwaran Wendy Parker Rob Wilson Doreen Fraser Thomas Polger James Woodward Michael Friedman Julian Reiss Kevin Zollman Peter Gärdenfors

### Managing Editor: Kayla Mehl-Hutchinson

#### **Governing Board of the Association**

President: John Dupré, University of Exeter President Elect: Michela Massimi, University of Edinburgh Past President: Alison Wylie, University of British Columbia

Hanne Andersen Alisa Bokulich Hasok Chang Kareem Khalifa Soazig Le Bihan Anya Plutynski Jutta Schickore Sean A. Valles

Executive Director: Ryan Feigenbaum

### **Information for Contributors**

The policies and procedures presented here are reproduced in greater detail on the editorial office's website: https://www.philsci.org/journal.php.

*Submission Method:* Manuscripts should be submitted electronically via the editorial office's website: https://philsci.org/submissions.php. All electronic files should be readable in Microsoft Word or formatted as TeX or LaTeX. (Special restrictions apply to TeX and LaTeX documents; please see the website for details.) Other correspondence with the editorial office may be sent to: *Philosophy of Science*, Department of Philosophy, University of Washington, Box 353350, Seattle, WA 98195, USA.

*Manuscripts:* Submissions must not exceed 9,500 words, including abstract, footnotes, and references; a word count must be submitted with each essay. Manuscripts should be submitted in a form suitable for blind review and should include an abstract of approximately 100 words. Authors are strongly encouraged to employ a clear, reader-friendly writing style.

Discursive footnotes (consecutively numbered) should be kept to a minimum. Simple citations can be made in the text, by citing author and year of publication (with page number if necessary); a bibliography should appear on a separate page at the end. A detailed guide to the reference style appears on the website.

*Copyright:* Manuscripts should be submitted to *Philosophy of Science* with the understanding that upon acceptance for publication copyright will be transferred to the Philosophy of Science Association.

*Book Reviews:* Books intended for review should be sent to the address given above. Persons wishing to review a book should contact the editorial office.

Correspondence concerning PSA business matters should be addressed to Ryan Feigenbaum, Executive Director, Philosophy of Science Association, University of Cincinnati, Cincinnati, OH 45221 (e-mail: director@philsci.org). The Philosophy of Science Association website is at https://www.philsci.org.

## VOLUME 88 • NUMBER 2 • APRIL 2021

# Philosophy of Science

# Contents

- 189 There Are No Mathematical Explanations JAAKKO KUORIKOSKI
- 213 Why Simpler Computer Simulation Models Can Be Epistemically Better for Informing Decisions CASEY HELGESON, VIVEK SRIKRISHNAN, KLAUS KELLER, AND NANCY TUANA
- 234 The Function of Boundary Conditions in the Physical Sciences JULIA R. S. BURSTEN
- 258 Proof of Concept Research STEVE ELLIOTT
- 281 Can Quantum Thermodynamics Save Time? NOEL SWANSON
- 303 A Justification of the Probabilistic Explanation of the Entropy Principle LAURENT JODOIN
- 320 Metainduction over Unboundedly Many Prediction Methods: A Reply to Arnold and Sterkenburg GERHARD SCHURZ
- 341 A Structural Justification of Probabilism: From Partition Invariance to Subjective Probability HANNES LEITGEB

### Book Review

366 NANCY CARTWRIGHT: Nature, the Artful Modeler: Lectures on Laws, Science, How Nature Arranges the World and How We Can Arrange It Better, reviewed by WALTER VEIT

### Essay Review

- 370 Demarcating and Judging Medicine: Review of Broadbent's "Philosophy of Medicine" JONATHAN FULLER
- 377 Referees for Philosophy of Science

**Philosophy of Science** (ISSN 0031-8248) is published January, April, July, October, and December by The University of Chicago Press, 1427 E. 60th Street, Chicago, IL 60637.

Periodicals postage paid at Chicago, IL, and at additional mailing points.

**Postmaster:** Send address changes to *Philosophy of Science*, The University of Chicago Press, 1427 E. 60th Street, Chicago, IL 60637, or subscriptions@press.uchicago.edu.

### Membership and Subscription Rates

Individual subscription rates for 2021 are tiered based on income and start at \$36 print + electronic, \$27 e-only. Institutional print + electronic and e-only subscription rates are tiered according to an institution's type and research output: \$307 to \$645 print + electronic, \$267 to \$561 e-only. Institutional print-only is \$352. Additional taxes or postage for non-US subscriptions may apply. For additional rates, including full-run access, rates for single copies, and reduced rates for students, visit http://www.journals.uchicago.edu/journals/phos/about. Free or deeply discounted access is available in most developing nations through the Chicago Emerging Nations Initiative (http:// www.journals.uchicago.edu/ceni).

### **Editorial Correspondence**

Send all editorial correspondence to *Philosophy of Science*, Department of Philosophy, University of Washington, Box 353350, Seattle, WA 98195. E-mail: journal@philsci .org. Information regarding submission of manuscripts can be found on the inside back cover of every issue or on our website: https://www.philsci.org/journal.php.

### **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 Coordinator, Journals Division, University of Chicago Press, 1427 E. 60th St., Chicago, IL 60637, USA. Fax: (773) 834-3489. E-mail: journalpermissions@press.uchicago.edu. 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.

© 2021 by Philosophy of Science Association. All rights reserved.