

CONTENTS

Introduction

Vale: Robert Nola (1940-2022)

The Gravitational Constant: From the Local to the Universal

Royal Society Early Career Research Award

Eighth Annual Conference on the History of Recent Social Science, 9–10 June 2023, Uppsala University

University of Pittsburgh, HPS Fellowships

HPS&ST in Latin America

International Committee for the History of Technology (ICOHTEC) 50th conference, 14-18 August 2023,

HPS&ST in Asia

Royal Society Early Career Essay Award

2023 AAPT (American Association for Physics Teachers) Winter Meeting

Introduction

The HPS&ST Newsletter is sent monthly to about 10,300 emails of individuals who directly or indirectly have an interest in the contribution of history and philosophy of science to theoretical, curricular and pedagogical issues in science teaching, and/or interests in the promotion of innovative, engaging and effective teaching of the history and philosophy of science. The newsletter is sent on to different international and national HPS lists and international and national science teaching lists. In print or electronic form, it has been published for 40+ years.

The Newsletter, along with RESOURCES, OBITUARIES, OPINION PIECES and more, are lodged at the website: [HERE](#)

Konrad Lorenz Institute Postdoc Fellowships: *Evolutionary theory in interdisciplinary contexts*

Opinion Page: How Science Education helps Learning from Disasters: Grenfell and Sewol

Wonyong Park, University of Southampton

Varia

Linda Hall Library Fellowships

New Journal: *History of Social Science*

Recent HPS&ST Research Articles

Recent HPS&ST Related Books

Coming HPS&ST Related Conferences

HPS&ST Related Organisations and Websites

#HPS&ST Newsletter Staff

The newsletter seeks to serve the diverse international community of HPS&ST scholars and teachers by disseminating information about events and publications that connect to concerns of the HPS&ST community.

Contributions (publications, conferences, Opinion Piece, etc.) are welcome and should be sent direct to the editor: Michael R. Matthews, UNSW, m.matthews@unsw.edu.au.

Vale: Robert Nola (1940-2022)

Robert Nola, professor Emeritus of Philosophy at the University of Auckland, New Zealand died on 23 October 2022. He was 82 years old. Robert is survived by his life-long partner Jan Crosthwaite, who was also a professor of philosophy in the same university.

Born in 1940, Robert Nola was an eminent philosopher of science. He was the son of a Croatian fisherman who had migrated to New Zealand in the 1930s and married; he was the first person in his family to attend university. He received a Bachelor of Science degree from the University of New Zealand, a Master of Science degree in Mathematics and a Master of Arts degree in philosophy, both from the University of Auckland. He obtained his PhD from the Australian National University, writing a thesis on *Theoretical change in the physical sciences: A study of theory reduction and theory replacement in science*, under the supervision of John Passmore. In 1971 he returned to the University of Auckland as a Lecturer in Philosophy and continued his academic career there until he retired as Professor of Philosophy in 2016.



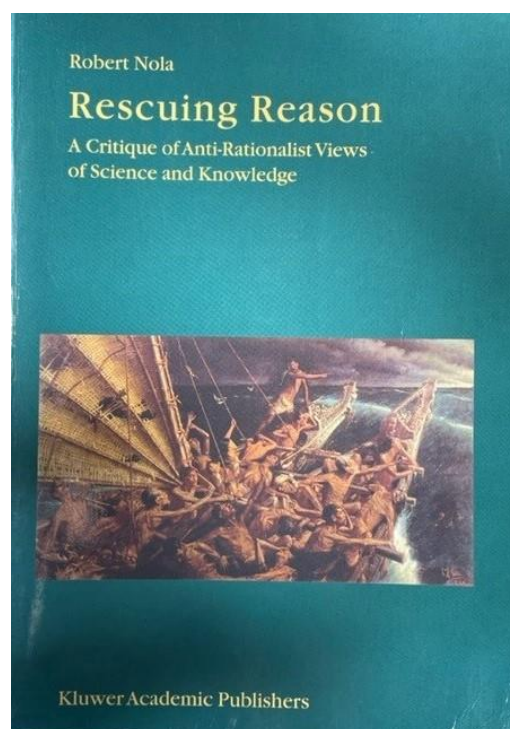
Nola held many visiting positions, including those at the Centre for Philosophy of Science in Pittsburgh and Boston Universities; the Department of History and Philosophy of Science, University of Cambridge; the Department of Philosophy at the University of Maryland, College Park; the Department of Philosophy, Uppsala University; and the Department of Philosophy, Bogazici University, Istanbul.

He was a prolific philosopher of science with wide ranging interest in metaphysics, epistemology, and science education. He was the author and co-author of three books, editor and co-editor of five

books, and the author and co-author of more than 80 articles and book chapters. Clarity and incisiveness, colored with wit, were hallmarks of his style. A wonderful example is his article, 'There Are More Things in Heaven and Earth, Horatio, Than Are Dreamt of in Your Philosophy: A Dialogue on Realism and Constructivism' (Nola 1994).

Nola was a staunch defender of scientific realism and a fierce critic of anti-rationalist philosophical and social positions. In his book *Rescuing Reason* (Nola 2003) he presented a powerful critique of sociological accounts of knowledge and truth, including those of Marx, Mannheim, the Edinburgh school of sociology of scientific knowledge, Foucault and Nietzsche. The book critically appraised the views of Quine, Kuhn and Feyerabend. In his *Theories of Scientific Method*, which he co-authored with Howard Sankey (Nola & Sankey 2007), he provided a comprehensive discussion of scientific methodology and meta-methodology.

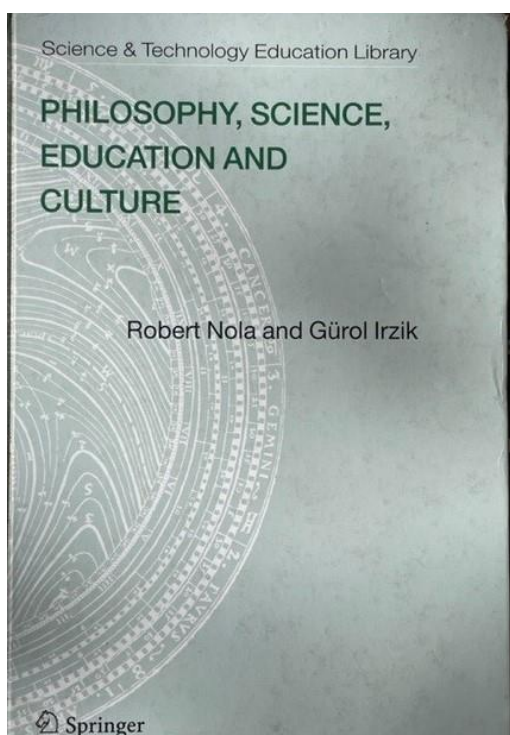
In both books, and in a number of influential articles, he defended a realist and normative account of scientific knowledge and rationality. One of his profound insights is that anti-rationalist and anti-realist accounts of knowledge and science presuppose much of the normative and realist theory they aim to replace.



Nola engaged with a multitude of philosophical issues occasioned by science education. This

engagement followed the 1992 appointment of Michael Matthews as Foundation Professor of Science Education at the University of Auckland (Matthews 2021, chap.7). They shared an Enlightenment conviction about the interdependence of science and philosophy (Nola 2018, Matthews 2022), the social and cultural importance of science education, and the necessity of good philosophy for understanding and addressing serious social, cultural, and educational issues.

Nola contributed articles to the new (1992) Kluwer journal *Science & Education: The Contribution of History, Philosophy and Sociology of Science* of which Matthews was the founding editor, he joined its Editorial Committee, presented papers to conferences of the International History, Philosophy and Science Teaching Group, contributed to the *HPS&ST Handbook* (Matthews 2014), and joined in large-scale national debates about the New Zealand science curriculum (Matthews 1995). Although there were seven philosophy departments in the country, Nola was the only philosopher to put time and energy into educational debate.



Nola's first papers in science education date back to his participation in the 1995 third IHPST conference (Nola 1995). The early papers present devastating criticisms of constructivist philosophical and pedagogical views which dominated New Zealand science education and

had significant worldwide influence at the time. His book *Philosophy, Science, Education and Culture* (Nola & Irzik 2005) placed critical inquiry at the core of education, criticizing the social constructivist, postmodernist and epistemic multiculturalist accounts of science.

In collaboration with Gürol Irzik, he also developed the family resemblance approach to nature of science for science education, which was subsequently taken up by key researchers in the field who turned it into a full-blown research program (Erduran & Dagher 2014).

Much of the final two years of Nola's life was occupied by a New Zealand debate which culminated in his February 2022 resignation from the Royal Society New Zealand. The debate was occasioned by his public stand on a philosophically-charged science-education issue: Namely, whether Mātauranga Māori (Māori ways of knowing, or Māori lore) should be included as science in the New Zealand school curriculum, or placed there as social studies. Nola defended the latter position. He argued that Māori lore lacks the essential methodology of science; its programme was subordinate to cultural interests; there is no evidence for the existence of key Māori explanatory entities or mechanisms such as Mauri; and that making modern science and Māori lore equivalent does historical and philosophical injustice to both.

This was the New Zealand occasion of an international argument about understanding and utilizing indigenous knowledge in school programmes. Many countries have had comparable arguments (Matthews 2022b [HERE](#))

Nola's arguments were presented in a co-authored 2019 Opinion Piece in the HPS&ST Newsletter (Nola, Corballis & Rata 2019) that can be read [HERE](#). They were repeated in a July 2021 letter, co-authored with seven University of Auckland professors (dubbed 'the defenders of science') to *The Listener*, a national magazine (Nola et al. 2021). Along with much else, the letter said:

To accept it [Mātauranga Māori] as the equivalent of science is to patronize and fail indigenous populations; better to ensure that everyone participates in the world's scientific enterprises. Indigenous knowledge may indeed

help advance scientific knowledge in some ways, but it is not science. (Nola et al. 2021)

The letter's publication occasioned something of a national upheaval. Immediately the University of Auckland Vice-Chancellor condemned the professors saying the letter 'caused considerable hurt and dismay among our staff, students and alumni'. The Auckland School of Biological Sciences labelled the professors as 'unsafe', advising students not to enroll in their classes. Within four days, the National Association of Scientists rejected the claims of the defenders. Within two weeks, 2,000 academics and teachers across the country signed a petition denouncing the professors as racist and, surprisingly as Nola was one of the authors, of not understanding the nature of science.

Disciplinary procedures were initiated within the RSNZ when a number of complaints were made against three of the defenders who were Fellows of the Society - Nola, Corballis and Cooper. They were, among other things, charged with 'not acting in a manner consistent with the Society's object and functions' and having a 'narrow and out-moded definition of science'.

After several months of investigation, and legal argument, the Society's Investigation Committee decided to take no further action on the complaints. A week after their February 2022 'exoneration' Nola and Cooper resigned from the Society. Corballis had died during the proceedings.

Nola, and co-defenders, argued that, in New Zealand, pupils should learn central tenets of Mātauranga Māori, such as the notion of Mauri.

Mauri is the life spark or essence inherent in all living things that has been passed down from ancestors through whakapapa. Mauri affects and is affected by the surrounding environment. It is a motivating force and also encapsulates a process of change from Mauri moe, a state where potential is as yet unrealised; through Mauri oho, sparks of interest and the realisation that change is possible; to Mauri ora, an action-oriented stage of striving towards full potential.

But learn about this in social studies at school, or anthropology in university, not in science in

either. They acknowledged that a separate consideration is whether other non-Māori, notably Asian, Indian or traditional Christian, worldviews should be taught and accommodated in the school curriculum.

Matters of great cultural, philosophical, and educational moment were at issue in a small country. That Garth Cooper, an Auckland professor of biochemistry and New Zealand's most eminent Māori scientist, was a co-author of *The Listener* letter, was equally to be sanctioned by RSNZ, and also resigned from the Society—confirmed Nola's convictions in the argument. Informed and careful philosophical thinking was of the essence for resolution of the controversy, and indeed for the future of science in New Zealand. Nola provided both.

The seven 'defenders of science' received near zero public support from the nation's academic establishment; there was no marching in the streets or even marching in quadrangles. This was no surprise to Nola, but nevertheless it deeply disappointed him. Details of how the debate unfolded can be read in a March 2022 HPS&ST Opinion Piece (Matthews 2022b [HERE](#)) and a 2022 Jerry Coyne note [HERE](#).

Nola's passing is a great loss not only to his family and his friends, who were fortunate to know him, but also to the history, philosophy and science teaching community.

Gürol Irzik, Philosophy Department, Sabanci University, Turkey

Michael Matthews, School of Education, University of New South Wales, Australia

Gürol Irzik: A personal appreciation

I met Robert and his wife Jan during the Fall semester of 1995, when we were fellows at the Center for Philosophy of Science in Pittsburgh University. This was the beginning of a long friendship and collaboration. I was privileged to be the co-author of his book on education (Nola & Irzik 2005), and articles on the family resemblance approach to nature of science in science education (Irizik & Nola 2011, 2014, 2022) as well as several other articles, including one on Lyotard's post-modernist views on knowledge and science (Nola & Irzik 2003).

When I was at Bogazici University, we were very fortunate to have, several times, Robert as a visiting professor. It was a great pleasure to teach together with him and to see how he touched the lives of so many students, both academically and intellectually. Robert, Jan, my wife, and I took a memorable trip along the Aegean coast of Turkey and visited many historical sites, including Gallipoli and of course the Anzac Cove, Assos, Troy and Pergamon. It was an intellectual feast to benefit from Robert's deep knowledge of history. When we visited them in Auckland, we felt at home thanks to Robert's and Jan's warm hospitality. This is when we discovered that Robert was also a talented cook and a connoisseur.

We also met during many conferences in Europe and had regular contact with each other. Robert was a true intellectual interested in all aspects of culture and the political affairs of the world. He was a voice of reason, a wonderful, kind and courageous person with a unique sense of humor. He had high intellectual standards and academic integrity, which led him to resign from the Royal Society of New Zealand, of which, for decades, he had been a Fellow. Despite these major travails, and his increasing medical problems, Robert pushed on conscientiously with revisions of our co-authored article on family resemblance ideas of NOS as applied to education (Irzik & Nola 2022). His final publication.

Robert's life set an example for us all.

Select Publications

Erduran, S. & Dagher, Z.R.: 2014, *Reconceptualizing the Nature of Science for Science Education*, Springer, Dordrecht.

Irzik, G. & Nola, R.: 2011, 'A Family Resemblance Approach to the Nature of Science for Science Education', *Science & Education* 20(7-8), 591-607

Irzik, G. & Nola, R.: 2014, 'New Directions in Nature of Science Research'. In M.R. Matthews (ed) *International Handbook of Research in History, Philosophy and Science Teaching*, Springer, Dordrecht, pp. 999-1021.

Irzik, G. and Nola, R.: 2022, 'Revisiting the foundations of the Family Resemblance Approach to Nature of Science: Some New

Ideas', *Science & Education*.
doi.org/10.1007/s11191-022-00375-7

Matthews, M.R.: 1995, *Challenging New Zealand Science Education*, Dunmore Press, Palmerston North.

Matthews, M.R. (ed.): 2014, *International Handbook of Research in History, Philosophy and Science Teaching*, 3 volumes, Springer, Dordrecht.

Matthews, M.R.: 2021, *History, Philosophy and Science Teaching: A Personal Story*, Springer, Dordrecht.

Matthews, M.R. (ed.): 2022a, *The Scientific Background to Modern Philosophy*, Hackett, Indianapolis.

Matthews, M.R.: 2022b, 'Indigenous Science and the Science Curriculum: The New Zealand Debate', *History, Philosophy and Science Teaching Newsletter*, March.

Nola, R.: 1978, 'Popper on Historicism and Marxism', *The New Zealand Journal of History*, vol. 12, pp. 124-45.

Nola, R.: 1980, '"Paradigms Lost, or the World Regained" - An Excursion into Realism and Idealism in Science', *Synthese: An International Journal for Epistemology, Methodology and Philosophy of Science*, vol. 45 no. 3, pp. 317-350.

Nola, R.: 1980, 'Fixing the Reference of Theoretical Terms', *Philosophy of Science*, vol. 47 no. 4, pp. 503-31.

Nola, R. (ed.): 1988, *Relativism and Realism in Science*, Reidel Academic Publishers, Dordrecht.

Nola, R.: 1992, 'Ordinary Inference as Refutation of the Strong Programme', *Social Studies of Science*, vol. 21, 1992, pp. 107-29.

Nola, R.: 1994, 'There Are More Things in Heaven and Earth, Horatio, Than Are Dreamt of in Your Philosophy: A Dialogue on Realism and Constructivism', *Studies in the History and Philosophy of Science*, vol. 25, pp. 689-727

Nola, R.: 1995, 'Objectivism and Constructivism in Knowledge, Science and Science Education'. In F. Finley et al. (eds.), *Proceedings of the Third International History, Philosophy, and Science Teaching Conference*, University of Minnesota, Minneapolis, Vol. 2, pp. 834-847.

Nola, R.: 1997, 'Constructivism in Science and in Science Education: A Philosophical Critique', *Science & Education* 6(1-2), 55-83. Reproduced in M.R. Matthews (ed.), *Constructivism in Science Education: A Philosophical Debate*, Kluwer Academic Publishers, Dordrecht, 1998, pp.31-59.

Nola, R.: 1999, 'On the Possibility of a Scientific Theory of Scientific Method', *Science & Education* 8, pp. 427-39.

Nola, R.: 2000, 'Saving Kuhn from the Sociologists of Science', *Science & Education* 9(1-2), 77-90.

Nola, R.: 2003, "'Naked Before Reality; Skinless Before the Absolute": A Critique of the Inaccessibility of Reality Argument in Constructivism', *Science & Education* 12(2), 131-166.

Nola, R.: 2003, *Rescuing Reason: A Critique of Anti-Rationalist Views of Science and Knowledge*, Kluwer Academic Publishers, Dordrecht.

Nola, R.: 2004, 'Pendula, Models, Constructivism and Reality', *Science & Education*, 13 2004, 349-77.

Nola, R.: 2018, 'The Enlightenment: Truths Behind a Misleading Abstraction'. In M.R. Matthews (ed.) *History, Philosophy and Science Teaching: New Perspectives*, Springer, Dordrecht, pp.43-66.

Nola, R. & Irzik, G.: 2003, 'Incredulity Toward Lyotard; A Critique of a Postmodernist Account of Science and Knowledge', *Studies in History and Philosophy of Science*, 34 #2, 391-421.

Nola, R. & Irzik, G.: 2005, *Philosophy, Science, Education and Culture*, Springer, Dordrecht.

Nola, R. & Irzik, G.: 2009, 'Worldviews and Their Relation to Science' *Science & Education* 18, 729-45. Republished in M.R. Matthews (ed.) *Science, Worldviews and Education*, Springer, pp.81-97.

Nola, R. & Irzik, G.: 2022, 'Revisiting the foundations of the Family Resemblance Approach to Nature of Science: Some New Ideas', *Science & Education*.

Nola, R. & Sankey, H. (eds.): 2000, *After Popper, Kuhn and Feyerabend*, Kluwer Academic Publishers, Dordrecht.

Nola, R. & Sankey, H.: 2007, *Theories of Scientific Method*, McGill-Queens University Press, Montreal.

Nola, R., Corballis, M. & Rata, E.: 2019, 'The Defense of Science and the Status of Māori Knowledge' *History, Philosophy and Science Teaching Newsletter*, November.

Nola, R., Clements, K., Cooper, G., Corballis, M., Elliffe, D., Werry, J. & Rata, E.: 2021, 'In Defence of Science', *New Zealand Listener*, July 31.

The Gravitational Constant: From the Local to the Universal

Workshop on *The Gravitational Constant, from the Local to the Universal*, [St Andrews, UK](https://www.gravconstant.net/), 20-21 April 2023.

The workshop is part of *The Gravitational Constant, from the Local to the Universal*, an interdisciplinary collaborative project between St Andrews and the Lichtenberg Group for History and Philosophy of Physics, University of Bonn (<https://www.gravconstant.net/>).

The project brings perspectives from transnational history, philosophy, mathematics and physics to bear on the question of how the constant, G , was transformed from a controversial innovation in the 1880s to an unquestioned fundamental constant of nature by 1915. The aim of the workshop is to explore the wider context and foster collaborations around emerging research questions.

The two-day workshop will treat gravitation as a case study in a wider context of interpretational moves at the turn of the 19th to 20th century from the local to the universal that took place through:

- measurement
- circulation practices
- ideas about the role of laws
- translation

Each theme will start with an invited speaker who sets the scene; followed by contributed papers; concluding with a discussion led by one of the project team on where the specific case of gravitation fits into the emerging context.

Invited speakers are:

- Daniel Mitchell (Measurement)(IEEE History Center, Piscataway, NJ)

- Richard Staley (Circulation Practices)(Cambridge and Copenhagen)
- Bryan Roberts (Role of Laws)(London School of Economics)
- Michael Gordin (Translation)(Princeton)

We invite contributed papers of 20 minutes that address one of the above themes from a historical or philosophical standpoint. Proposals should include an abstract (c.250 words), state which theme they are addressing, and give a brief biography of the speaker.

Funds are available to provide some support for early career scholars.

Proposals should be submitted to Isobel Falconer (ijf3@st-andrews.ac.uk) by **15 December**. Decisions will be notified at the beginning of January.

Royal Society Early Career Research Award

The award consists of a cash prize of £500 and publication in the journal, a runner-up prize of £250 and three honourable mentions will each receive £100. The previously unpublished essay of up to 12,000 words should be based on original research and it may relate to any aspect of the history of science, technology and medicine in any period.

Deadline for submission of an essay is 28th February 2023

Details are here:

<https://royalsocietypublishing.org/rsnr/essay-award>

There is also a video about the prize here:

<https://www.youtube.com/watch?v=iCwSu9DzCXk>

Professor Anna Marie Roos FLS FSA
Professor of the History of Science and Medicine
University of Lincoln notes@royalsociety.org

Eighth Annual Conference on the History of Recent Social Science, 9–10 June 2023, Uppsala University

This two-day conference of the [Society for the History of Recent Social Science](#) (HISRESS), at

Uppsala University in Sweden, will bring together researchers working on the history of post-World War II social science. It will provide a forum for the latest research on the cross-disciplinary history of the post-war social sciences, including but not limited to anthropology, economics, psychology, political science, and sociology as well as related fields like area studies, communication studies, history, international relations, law, education, and linguistics. The conference aims to build upon the recent emergence of work and conversation on cross-disciplinary themes in the post-war history of the social sciences.

Proposals should contain no more than 1000 words, indicating the originality of the paper. The deadline for receipt of abstracts is February 3, 2023. Final notification will be given in early March 2023 after proposals have been reviewed. Completed papers will be expected by May 5, 2023.

The organizing committee consists of Jenny Andersson (Uppsala University), Jamie Cohen-Cole (George Washington University), Philippe Fontaine (École normale supérieure Paris-Saclay), Jeff Pooley (Muhlenberg College), and Per Wisselgren (Uppsala University).

All proposals and requests for information should be sent to submissions@hisress.org.

University of Pittsburgh, HPS Fellowships

The Center for Philosophy of Science at The University of Pittsburgh is accepting applications for 2023-2024 Visiting Fellows and Postdocs until December 09, 2022.



The Center has invited **Arnon Levy** (Hebrew University of Jerusalem) to be the Senior Visiting Fellow for 2023-2024, and we particularly welcome applications from those whose research intersects with his.

Visiting Fellows - a one or two-term appointment for fall and/or spring terms which includes a living stipend.

Learn more [HERE](#)

<https://www.centerphilsci.pitt.edu/programs/visiting-fellows/program-overview/>

Apply [HERE](#)

Postdoctoral Fellows - an 8-month (fall and spring term) appointment with a full salary and health benefits for early career scholars who have completed a PhD within the last 5 years.

Learn more [HERE](#)

Apply [HERE](#)

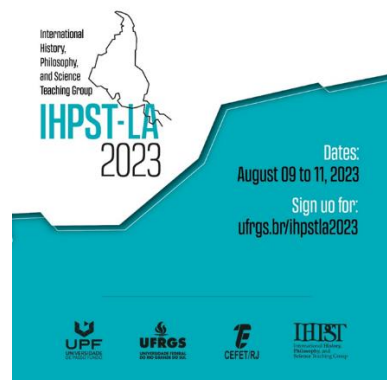
HPS&ST in Latin America

IHPST-LA 2023: HPS&ST in times of science denial

The IHPST-LA will be held in Porto Alegre (Brazil) from August 9th to 11th, 2023. It will gather researchers from all Latin America to discuss HPS&ST and its contemporary challenges.

Following the recent discussions in the field, the conference theme will be “HPS&ST in times of science denial”. The meeting is being planned by researchers from different countries in Latin America, aiming to provide a plural and collective event.

Registration and work submission is already available. More information is available [here](#).



ENPEC 2023 (Encontro Nacional de Pesquisa em Educação em Ciências).

The XIV ENPEC will be held in Caldas Novas, Goiás (Brazil) from October 2nd to 6th.

Conference paper submission is available until November 15th, 2022. More information is available [here](#).

Tendências de pesquisas para a Educação em Ciências - This book is intended for professionals and students in the field of Science Education research. With proposals derived from academic research, this work's main objective is to give visibility to different theoretical references, which can contribute to approaching new trends and objectives on how our research. The book is available for download [here](#).

Sequências didáticas para educação CTS (Ciência, Tecnologia e Sociedade). In this e-book are gathered 28 didactic sequences produced by teachers in different contexts. The book is available for download [here](#).

Do you have any contributions about HPS&ST in Latin America?

If you have any information about events, publications, research groups, books about HPS&ST in Latin American and want to submit a brief note to be published in the HPS&ST Newsletter, please contact first Nathan Lima (Federal University of Rio Grande do Sul) [here](#) or secondly Michael Matthews [here](#).

International Committee for the History of Technology (ICOHTEC) 50th conference, 14-18 August 2023, Tallinn University of Technology and the University of Tartu, Estonia

The 2023 [ICOHTEC](#) annual conference invites scholars to reflect on the complex, mutual relations between technology and the

environment, culture, and politics, as well as the ways in which they are entangled at the local, regional, transnational, and global levels. The crises we face today as a consequence of climate change, wars, or the COVID pandemic expose the reality that no institution, company, country, community, or body is independent. They all depend on diverse others within various networks, e.g. production and distribution systems; supply chains, especially of food, energy, materials, and medical products as well as human workers; support and care systems created at the global, national, and interpersonal levels.

We invite scholars working on different aspects of the history of technology, various historic periods, different geographical areas, and welcome researchers working at the intersection of history of technology or philosophy of technology, and other fields, including anthropology, design studies, film and media studies, social sciences, minority and identity studies, to share their perspectives and analyses. We look forward to opening new avenues for exploring the interdependencies between disciplines, paradigms, research methods and theories that relate to technology.

Individual paper proposals must include: (1) the presenter's name and email address; (2) the title of the paper; (3) an abstract (max. 300 words); (4) the presenter's bio (max. 250 words).

We strongly support the submission of proposals for *pre-constituted panels* of 3 or 4 papers. Panel organizers are asked to submit: (1) an abstract of the panel theme (max. 300 words); (2) a list of presenters that includes their names, email address, and paper titles, as well as the name and email address of the session chairperson; (3) abstracts for each paper (max. 300 words); (4) a bio for each contributor and the chairperson (max. 250 words each).

Submit all session and individual paper proposals by **15 January 2023** via the ICOHTEC paper submission system: [HERE](#)

We especially encourage and welcome proposal submissions from graduate students and early career researchers and their participation in the symposium. Limited travel grants will be available.

HPS&ST in Asia

- From October 20 to 21, 2022, the Ministry of Science and Information Communication Technology of Japan, the National Association for Science and Technology Research, and the Department of Education of Daejeon City held the 7th World Science and Culture Forum in Hall 2 of Daejeon Convention Center (DCC). The forum carried out exchanges and discussions on global scientific topics with great social impact on the future of Korean society, aiming to promote the integration of science and culture and the popularization of science.

Details of the conference can be found [HERE](#)

- On November 5, 2022, Japan held a seminar on "What kind of planet is our Earth—Exploring the Earth through Hybrid Science" at the Telecenter. Through presentations by front-line researchers and dialogues with the audience, this conference aims to make the public understand the interest of basic science and the challenges of exploring atmospheric science based on observations and calculations and the stars that nurture life as Earth-like planets together.

Details of the conference can be found [HERE](#)

- From November 3 to 5, 2022, the 12th International Symposium on Science Museums was held at the National Central Science Museum of Korea, with the theme of *Citizen participation in science and social harmony and science perspectives*. It aims to discover and disseminate various research and practical examples in the field of science museums. Various discussions were held on the sustainable development of science and social harmony, and the role of science museums in establishing a link between science, technology, and democracy, etc.

Details of the conference can be found [HERE](#)

- From January 10 to January 11, 2023, the Jeju Institute of Future Education and the National Science Teachers Association will hold a big gathering of Korean science teachers at Jeju High School in Korea. The gathering is divided into six areas, include student-centered class operation cases, process-oriented evaluation operation cases, experiment development case show, science festival experience program, Jeju nature exploration, and special session (experience classes for children of participants).

Details of the conference can be found [here](#)

• If you have any information about events, publications, research groups or books about HPS&ST in Asia and want to submit a brief note to be published in the HPS&ST Newsletter, please contact first Xiao Huang (Zhejiang Normal University) [HERE](#) or secondly Michael Matthews [HERE](#).

Royal Society Early Career Essay Award

Notes and Records: The Royal Society Journal of the History of Science essay prize competition for early career researchers (those who have completed a postgraduate degree within the past 5 years) is open. A previously unpublished essay of up to 12,000 words should be based on original research and it may relate to any aspect of the history of science, technology, and medicine in any period. The award consists of a cash prize of £500 and publication in the journal, a runner-up prize of £250 and three honourable mentions will each receive £100. The *deadline* for submission of an essay is 28th February 2023

Details of the prize are [HERE](#)

There is also a video about the prize [HERE](#)

Email Questions [HERE](#)

2023 AAPT (American Association for Physics Teachers) Winter Meeting

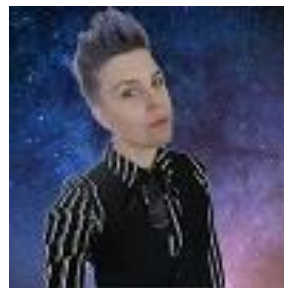
Awardees



Jocelyn Bell Burnell has been selected to receive the **2023 Richtmyer Memorial Lecture Award**. She is recognized with the award for outstanding contributions to physics and for effectively communicating those contributions to physics educators.



Kimberly Ann Coble, Professor of Physics at San Francisco State University will receive the **2023 John David Jackson Excellence in Graduate Physics Education Award**. The Jackson Award recognizes her work as a teacher of graduate Physics and Astronomy. She is a pioneer in graduate physics & astronomy education.



Darsa Donelan will receive the **2023 recipient of the Doc Brown Futures Award**. The Doc Brown Futures Award recognizes early-career members who demonstrate excellence in their contributions to AAPT and physics education and exhibit the potential to serve in an AAPT leadership role.



Dr. Sylvester James Gates, Jr. has been named as the **2023 recipient of the prestigious Hans Christian Oersted Medal**. The Oersted Medal recognizes his outstanding, widespread, and lasting impact on the teaching of physics through his national leadership in physics education, his exceptional service to AAPT, and his mentoring of students and in-service teachers. The year of 2022 marks the fifty-first consecutive year of his service as a university instructor in mathematics and physics.

Recipients will be honored for their outstanding contributions to physics education at the winter meeting (14-17 January 2023, Portland, OR). Click [here](#) to read more.

Konrad Lorenz Institute Postdoc Fellowships: Evolutionary theory in interdisciplinary contexts

Evolutionary arguments and theories are often mobilized in other disciplines as well as in different societal contexts and discourses. These translations are challenging and require interdisciplinary and theoretical engagement at the intersection of evolutionary biology and other scientific or scholarly fields. In order to foster this engagement, the Konrad Lorenz Institute (KLI) is seeking 3 postdoc fellows conducting interdisciplinary evolutionary research with a focus on theoretical approaches, including conceptual, mathematical, and historical analyses.

We encourage applications from research fields such as evolutionary medicine, including evolutionary epidemiology in public health; evolutionary ecology and conservation biology; evolutionary neuroscience and psychology; and biocultural evolution. Projects may also comprise empirical work carried out with partner institutions. Furthermore, we invite projects from ethics, philosophy, history and social studies of science that engage with the epistemological and ethical issues that emerge when using evolutionary arguments and theories in contexts and discourses outside of evolutionary biology.

Inquiries: **Dr. Lynn Chiu**
Department of Evolutionary Biology
University of Vienna, Austria
chien-hui.chiu@univie.ac.at

Opinion Page: How Science Education helps Learning from Disasters: Grenfell and Sewol

Wonyong Park, University of Southampton



Wonyong Park is Lecturer in Science Education at the University of Southampton. His work utilises

history, philosophy and social studies of science to rethink and enhance science teaching. His recent interests include education of modern physics, interdisciplinary and cross-subject learning, assessment of the nature of science, and teaching about disasters in science education. He was recently awarded a grant from the Economic and Social Research Council in the UK to undertake the TeachDisasters project with an international group of science educators, historians and scientists.

w.park@soton.ac.uk

In recent years, there have been major opportunities and challenges for science educators. On the one hand, the coronavirus pandemic has shed light on the importance of international scientific collaboration in combatting a global public health emergency, creating unrivalled opportunity to teach about the nature of science in the current time. At the same time, and perhaps more importantly, the pandemic has posed pressing questions around science mistrust and denial, policymaking in the absence of conclusive evidence, and delineation between scientific and pseudoscientific claims, which are central concerns to science educators (Osborne et al., 2022).

What has worsened the crisis is its coincidence with post-truth enthusiasm, where appeals to emotion overwhelm facts and reason, indeed where the very possibility of fact and truth is denied. Non-scientific and anti-scientific attitudes can be particularly malicious during a disaster like the pandemic and negatively impact individual and social well-being. As Fortun and Morgan (2015) note, information related to disasters is “almost always contested and politically charged” (p. 61) and therefore easy to be distorted and mislead the public. What is, then, the role of science education in mitigating, coping with, recovering from and remembering disasters? How should science education researchers, policymakers and practitioners act to make change?

Classroom Opportunities

Some readers might wonder why science, of all subjects, should take on such tasks. Cannot these be left to other subjects like history and social studies?

First, while these school subjects should keep contributing to disaster preparedness and resilience, it does not mean that science is irrelevant or has no role to play. Social studies aim to cultivate democratic citizenship, but that does not preclude science from pursuing the same goal. Recent arguments for teaching about risks in science education (Christensen, 2009; Kolstø, 2006; Schenk et al., 2019) also show that science can play a pivotal role to play in understanding disaster risk. This view resonates with the call for a radical and action-oriented science and technology education by adopting new goals in relation to the contemporary social, ecological and material conditions (Alsop & Bencze, 2014).

Second, there are compelling reasons to see science as genuinely integral to our understanding and response to disasters, and any education about disaster that leaves out its scientific dimension would be incomplete. At the beginning of the pandemic, I drew on the ideas of philosophy of technology to suggest that, by learning about disasters in science education, students can not only gain the knowledge, skills and competences needed for coping with disasters but also develop a deep understanding of how science and technology operate in modern society (Park, 2020). This initial idea has led me to work with disaster scholars, bereaved families, activists, and educators to examine how science education can help us build disaster resilience for social justice.

This essay considers two disaster examples that are technological in nature—a residential building fire and a maritime accident. This choice is intentional, because it is often less evident how technological disasters, compared to disasters like earthquakes, droughts and climate change, can relate to and be addressed in science education. These disasters are nowadays ubiquitous across the world—fires, building and infrastructure collapse, aeroplane crashes, blackouts, toxic wastes, dam failures, nuclear disasters, chemical spills, and factory explosions, just to name a few.

When a technological disaster happens, it is rare to see the disaster's scientific or technical aspects discussed in the media; the absence of science and technology can be similarly noticed in visits to disaster memorials and museums. A possible reason for this is that these disasters are often attributed to *human* failures, having little to do

with science or technology. Science and technology studies (STS) scholars have challenged such a view, by pointing to the inherent complexity of some technological systems that make them destined to fail (Perrow, 1984; Pinch, 2012).

Instead of thinking of disasters as a result of human mistakes—it is the systematic failure of a *network* of humans and non-humans that cause a disaster—an STS approach understands them as “failures of diverse, nested systems, producing injurious outcomes that cannot be straightforwardly confined in time or space, nor adequately addressed with standard operating procedures and established modes of thought” (Fortun et al., 2016, p. 1004).

Disaster investigation as a scientific activity

In 2022, two important disaster investigations were conducted. These are the focus of this paper (Figure 1). The first case is the sinking of MV Sewol in 2014 near the southwestern shores of South Korea, with 476 people on board. It killed 304 passengers, most of whom were high school students on the way to a field trip to Jeju Island.

The year 2022 also marked the fifth anniversary of the Grenfell Tower fire in North Kensington, London, that happened on the night of 14th June 2017. One of the worst disasters in modern British history, the fire claimed the lives of 72 residents, coming from culturally diverse backgrounds, in the high-rise apartment. Although occurred three years apart and in different parts of the globe, there are strikingly similar aspects of the two disasters, many of which were revealed during the investigations.

Investigation of a disaster is a scientific activity. It uses evidence, either existing or generated, to establish facts, and construct and test theories about what happened during the disaster. As Perrow (1984) observed by analysing the Three Mile Island nuclear accident, a disaster includes a complex chain of errors, failures and interactions that are in need of scientific investigation and analysis. This complex nature of disasters makes them inherently “epistemic events” that involve the (un)production of knowledge (Frickel & Vincent, 2010).

Disaster investigation as a scientific activity should not be equated or conflated with a criminal investigation. It is because, as Jasanoff (1995) emphasised, science and law are similar in their purpose to discover the truth, but there are important differences. Both Grenfell and Sewol investigations were independent of the legal procedures and inquisitorial in nature, focusing on setting out the chain of events leading to the disaster under investigation. As former UK Prime Minister Theresa May said after Grenfell, we undertake investigation because “we need to know what happened, we need to have an explanation of this”.

As easy as the task of scientific fact-finding sounds, it is never simple. Scott Gabriel Knowles describes what happens when a scientist enters the disaster scene:

When scientists and engineers leave the lab and enter the investigative team, they assume a temporary role as arbiters of disputes that have often become (often instantaneously) hopelessly politicised, wielding “facts,” and scientific method in the name of rational blame assignment. (Knowles, 2013)

An investigation committee was set up shortly after each disaster to understand what happened and why. Despite the scientific nature of disaster investigation, it was rare to see the technical and scientific aspects of the investigations in media coverage of Grenfell and Sewol. The intimate relationship between science and disasters remains hidden to folk until they see or experience disaster hearings and trials where scientists and engineers produce ample knowledge about what happened and what went wrong. Much of it became only visible after the “black boxes”—complex technological systems whose inner workings are obscured and incomprehensible (Latour, 1999)—were opened, through a long and laborious process of collecting and analysing evidence, piece by piece, by the public inquiry.

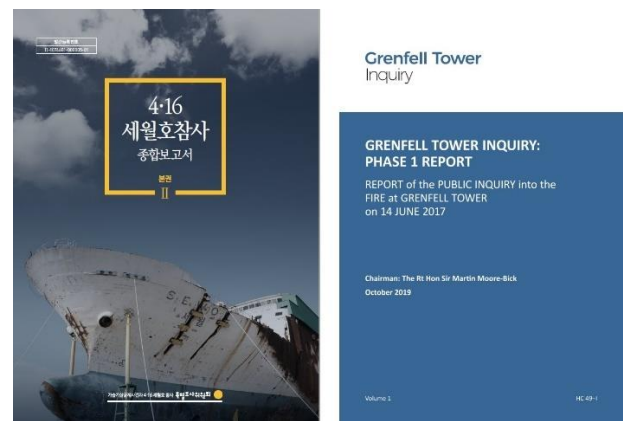


Figure 1. Reports of the Sewol (left) and Grenfell (right) investigations. (Source: The Special Investigation Commission on Humidifier Disinfectants & 16th April Sewol Ferry Disasters, and Grenfell Tower Inquiry)

The Grenfell Tower fire (2017)

The Grenfell Tower Inquiry was established three months after the fire to investigate the disaster in two phases. The first phase of the Inquiry focused on how the blaze started and then rapidly developed. The second phase, conducted between 2020 and 2022, delved into how the tower came to be in a condition that allowed the fire to spread in such a way.

Throughout the four years, the Inquiry was assisted by 17 expert witnesses, the majority of whom were scientists and engineers studying fire safety from different academic backgrounds, including mechanical engineering, aerospace engineering, forensic chemistry. The role of these expert witnesses was to “give an opinion on matters which call for expert skill and knowledge”, but perhaps more challenging for them was to communicate their scientific opinions to the members of the Inquiry, not all of whom had a scientific background.

From the early phases of the Inquiry, it became evident that the refurbishment of the building between 2012 and 2016 and the cladding system introduced then were significant contributors to the disaster. The cladding system, attached to the external concrete wall, comprised a layer of insulation and the aluminium composite material (ACM) rainscreen panels, and a cavity separating the two. The combustible polyethylene core of the ACM cladding panels turned out to have allowed the flames and hot gasses to pass, which was identified as the principal reason why the fire

spread violently at an unusual speed (Figure 2). The Inquiry ascertained that the fire started in the kitchen of one flat in the tower, escaped the flat through the kitchen windows, and spread throughout the building rapidly such that many people were unable to escape the building.

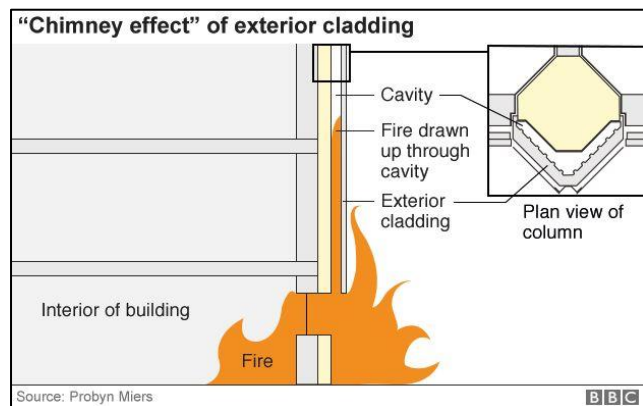


Figure 2. Exterior cladding of Grenfell Tower (Source: BBC)

On 9th June, 2022, José Torrero, a fire safety engineer and professor at University College London, provided expert witness evidence relating to the fire safety testing regulations. In order to explain the principles of fire testing, he started with physics knowledge that the velocity of a fluid is proportional to the square root of the pressure potential—or Bernoulli’s principle (Figure 3). Understanding this relationship is a prerequisite for determining the key physical parameters controlling the spread of fire, which in turn allows assessing the adequacy of the regulatory regime.



Figure 3. Professor and fire safety engineer José Torrero. (Source: Grenfell Tower Inquiry)

During the Inquiry, it was not only the content of science that expert witnesses had to explain to the panel to grasp what happened on the night of the fire. They also had to convince people about the process in which scientific investigation of the fire

is carried out. At the hearing on 19 June, 2018, forensic chemist and professor Niamh Nic Daeid at Dundee University began her expert witness presentation by explaining the chemistry of combustion, after which she introduced the process of fire scene investigation (Figure 4). She emphasised that “It is often stated that fire scene investigation should follow what is called a scientific method. This presents a systematic data collection and data analysis process, followed by the development of various hypotheses, which are tested against that data, and a final hypothesis is chosen”.



Figure 4. Professor and forensic chemist Niamh Nic Daeid. (Source: Grenfell Tower Inquiry)

These two episodes, selected from the many hearings of the Grenfell Inquiry, vividly illustrate that scientific knowledge and methods are indispensable to investigating, and therefore understanding, a disaster. Science is crucial to understanding why a disaster occurred and how, which is a starting point for building resilience and achieving justice. Experiments and tests based on scientific methods and models form the foundations of fire safety and are crucial to identifying the failings involved in disasters, attributing responsibility and blame, and considering how not to repeat the same mistake. As citizens, students should be able to grasp the scientific basis of disasters and the role of science and engineering in our understanding of disasters.

The Sinking of MV Sewol (2014)

The Grenfell Tower Inquiry managed to reach a conclusion, with a good level of certainty and agreement, about where the fire started and how it could spread at an unusual rate. Still, they were unable to establish what exactly caused the fire, a relatively minor issue in the overall process of the investigation. The Sewol investigation similarly failed to arrive at a satisfactory conclusion about the rapid turning, heeling, flooding and sinking of

the vessel, but this matter was of much greater importance than in Grenfell's case.

Although in separate times and spaces, comparing Sewol with Grenfell exposes stunning similarities between the two disasters. The Sewol Investigation (formally The Special Investigation Commission on Humidifier Disinfectants & 16th April Sewol Ferry Disasters) had an aim similar to that of the Grenfell Tower Inquiry—to set out the events leading to the capsizing and sinking of the ship, and how an accident was made a disaster. Like the refurbishment of Grenfell that led to the use of the cladding products that were violently combustible, the Commission found that MV Sewol had gone through renovations that raised its centre of gravity by 64.2 to 83.2 cm, compromising the vessel's transverse stability (i.e., the ability to recover from heeling and return to vertical; see Figure 5).

The investigation also identified other factors contributing to decreased transverse stability, such as insufficient ballast water and overloaded and poorly fixed cargo (Figure 6). In addition, the Commission found that these conditions were made possible due to cascading human errors and inadequate decisions that gave rise to them, from testing and certification bodies, the captain and crews, the Coast Guard, and the government.

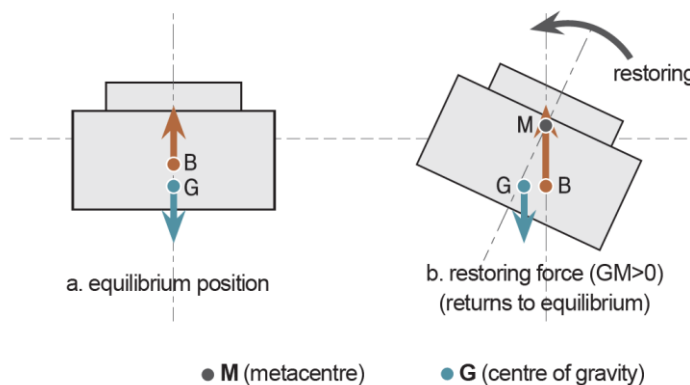


Figure 5. The relationship between the centre of gravity, centre of buoyancy, and restoring force. (Source: The Special Investigation Commission on Humidifier Disinfectants & 16th April Sewol Ferry Disasters)

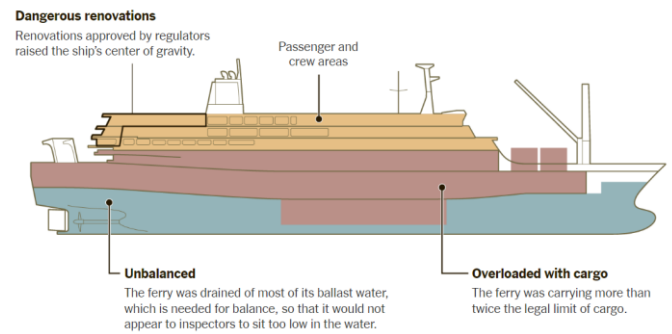


Figure 6. Major failures that caused the sinking of MV Sewol. (Source: New York Times)

Like the Sewol Commission, the Grenfell Tower Inquiry collected various existing sources of evidence and also generated fresh evidence by undertaking a programme of experiments in varying physical conditions. Among the core sources of evidence were model simulations and experiments. The Maritime Research Institute Netherlands (MARIN), at the request of the committee, performed tests and simulations using a model ship generated to a scale of 1:25 (Figure 7).

The tests were carried out in the presence of the bereaved families and representatives from the Commission. Based on the available evidence about the ship's tracked positions, cargo movement, and rudder motions, and newly produced experimental evidence, MARIN concluded that the sharp turning, extreme heeling, and subsequent flooding and sinking of the vessel could be fully explained from a hydrodynamic point of view (see Jeon, 2020 for a summary of early MARIN experiments), without introducing any external force that might have been exerted by an underwater object.

Also involved in the investigation was a professional organisation of naval scientists and engineers. The Society of Naval Architects of Korea (SNAK), at the request of the Commission, reviewed the relevant evidence independently, examined the salvaged vessel, and assessed hypotheses about the cause of the disaster. In the opening of the expert witness report, the society establishes the principles for the assessment of hypotheses that are worth noting:

- i. When the records are not 100% available about an objective fact, there can exist multiple hypotheses in order to investigate the fact.

- ii. The assessment of hypotheses should follow the process of science and engineering investigation, adopting the most probable hypothesis, and rejecting hypotheses that are significantly less likely (p. 4).

SNAK fully endorsed MARIN's conclusions from the experiments about the cause of the accident, but the Commission's final report dissented from their analysis, raising questions about several technical aspects of MARIN's experiments that rejected the possibility of an external force. Instead of providing an answer to what caused MV Sewol to sink, the Commission stated:

... evidence was not sufficient and interpretations were competing. In particular, the material evidence relating to the sinking of MV Sewol was damaged and lost while the vessel was immersed in the water. Due to these constraints, it was difficult for the Commission to identify the cause of the sinking with sufficient evidence and no doubt. (p. 89)

The report recognised that two of the six members present at the meeting—who found the MARIN report scientifically valid and acceptable—expressed a dissenting opinion.

The Commission's divided conclusion can be viewed in a number of ways. Some attribute it to the uncertainty and dispute involved in science-in-the-making, or the lack of evidence sufficient to reach a single conclusion about the sinking. Others may trace it back to the political nature of disaster investigation and how the outcomes might be influenced by partisan politics and polarisation (Chung et al., 2022; Jeon et al., 2022). The Special Act instructed that the Commission should comprise nine members—one recommended by the Chairman of National Assembly, four by the ruling party, and the remaining four by the opposition party. This stands in contrast to the Grenfell Tower Inquiry where all panel members were appointed by the Minister.

Investigation into the Sewol disaster might not have achieved a single conclusion, but the Commission's efforts were not in vain. The investigation has increased our knowledge about various facets of the Sewol disaster, and it has brought to light important issues that had not been noticed previously. The final report describes why

the Commission thinks that their activities still have value:

The Commission could conclude that the possibility of an extreme right turn due to a broken solenoid valve is very low and the hypothesis that Sewol sank due to a collision with an underwater object is not supported by evidence. By testing and verifying widespread rumours, the Commission contributed to mitigating unnecessary controversies and reducing social costs. (p. 89)

Disaster investigation, nature of science, and activist science education

As underscored by Professor Daeid and SNAK, disaster investigation involves a scientific process of gathering and assessing evidence and formulating and testing hypotheses about why the disaster happened and what went wrong. Disasters such as Grenfell and Sewol, when understood as systematic failures of high-risk technological systems (Perrow, 1984), can be thought of as phenomena to investigate and produce knowledge about, which can in turn inform our future actions. Although disaster investigation is often not perfect and there are remaining uncertainties about the two disasters, it is evident that, compared to 2014 and 2017, we are here with much more evidence, more analysis, and consequently, more knowledge about Sewol and Grenfell.

The shocking failures exposed by the investigations, and the uncanny similarities between the two disasters, should not be forgotten. We need to ask: Who is held accountable and liable? Who bears the blame? And most importantly, how can we not repeat it? These are important questions pertaining to disaster justice, but let us remember that underlying all these questions is “What happened, and how?”, which is an inherently scientific question. Scientific evidence and inquiry are a necessity—although not always a sufficiency—for ascertaining facts about the material and human world.

Disaster investigation can, retrospectively, reveal the sources of risks and how they interact in unanticipated ways to cause a disaster. Crucial to this task is the exploitation of scientific tools such as data collection, data generation and data analysis, and testing competing hypotheses relating to the cause of the disaster. Any account

of a disaster involves humans as well as non-humans—regulations, physical laws, cargo, ballast water, cladding panels, solenoid valves, model ships. Disaster investigations tell us much about the nature of high-risk technological systems, comprising humans and non-humans, that are ubiquitous in society, and the role of science in our efforts to tackle such risks. Such a close relationship between science and disasters points to the potential contributions that science education can make to imagining and building a better society.

Meanwhile, to the extent that disaster investigation is a scientific activity, it becomes subject to the *limits* of science. Both Grenfell and Sewol investigations suggest that it may not always be possible to identify a single, root cause of a disaster—this could happen when the evidence is insufficient and the “theory” is underdetermined by what is available, or when it is not even possible to generate further evidence whilst key evidence was already lost.

Empowering citizens, particularly those who have been historically marginalised, with an understanding of disasters will be the first step to changing the process in which decisions about disasters are made. Rumbach and Németh (2018) remind us that “decisions about who gets what, as well as the mechanisms of re-distribution, are very often left to historically powerful actors rather than the likely beneficiaries of such actions” (p. 343). A scientifically grounded understanding is also fundamental to assigning blame, based on the cause of the disaster identified from investigation. When there is a shared understanding, it will help communities and countries to be better prepared to withstand and bounce back from disasters.

Underpinning the argument about addressing disasters in science education is the idea of activism, defined as “intentional efforts to promote, impede or direct social, political, economic or environmental change” (Alsop & Bencze, 2018, p. 8).

Learning about disasters can open the door to critical reflection on the nature of science and technology in the context of tragedies where science meets politics, ethics, and history, which can lead to action to make society understand and minimise disasters. This way, education for disaster justice and resilience resonate with a

radical and action-oriented vision for science and technology education aimed toward social justice.

For us to achieve such an aim, science education needs to support students to grasp, with the help of science and engineering knowledge, what caused a disaster as well as the underlying conditions that make societies vulnerable to disasters in the short and long term—inequality, poverty, corruption, discrimination, urbanisation, and lack of education. We need to remember disasters rather than forget, and science educators should be a key player in shaping how we remember disasters.

References

- Alsop, S., & Bencze, J. L. (2014). Activism! Toward a more radical science and technology education. In J. L. Bencze (Ed.), *Activist science and technology education* (pp. 1–19). Springer.
- Christensen, C. (2009). Risk and school science education. *Studies in Science Education*, 45(2), 205–223.
- Chung, J. B., Choi, E., Kim, L., & Kim, B. J. (2022). Politicisation of a disaster and victim blaming: Analysis of the Sewol Ferry case in Korea. *International Journal of Disaster Risk Reduction*, 69, 102742.
- Fortun, K., Knowles, S. G., Choi, V., Jobin, P., Matsumoto, M., & de la Torre, P. (2016). Researching disaster from an STS perspective. In U. Felt, R. Fouché, C. A. Miller, & L. Smith-Doerr (Eds.), *Handbook of science and technology studies* (4th ed., pp. 1003–1028). MIT Press.
- Fortun, K., & Morgan, A. (2015). Thinking across disaster. In J. Shigemura & R. K. Chhem (Eds.), *Mental health and social issues following a nuclear accident: The case of Fukushima* (pp. 55–64). Springer.
- Frickel, S., & Vincent, M. B. (2011). Katrina’s contamination: Regulatory knowledge gaps in the making and unmaking of environmental contention. In R. A. Dowty & B. L. Allen (Eds.), *Dynamics of disaster: Lessons on risk, response and recovery* (pp. 11–28). Earthscan.
- Jasanoff, S. (1997). *Science at the bar: Law, science and technology in America*. Harvard University Press.

Jeon, C. (2020, 26th April). [News analysis] “Sewol science” and international maritime safety. *The Hankyoreh*.
https://english.hani.co.kr/arti/english_edition/e_national/942008.html

Jeon, C., Knowles, S. G., & Park, S.-E. (2022). Disaster (continued): Sewol Ferry investigations, state violence, and political history in South Korea. *History and Technology*, 38(1), 84–106.

Knowles, S. G. (2013). Investigating 3.11: Disaster and the politics of expert inquiry. An STS Forum on the East Japan Disaster.
<https://fukushimaforum.wordpress.com/online-forum-2/online-forum/investigating-3-11/>

Kolstø, S. D. (2006). Patterns in students’ argumentation confronted with a risk-focused socio-scientific issue. *International Journal of Science Education*, 28(14), 1689–1716.

Latour, B. (1999). *Pandora’s hope: Essays on the reality of science studies*. Harvard University Press.

Osborne, J., Pimentel, D., Alberts, B., Allchin, D., Barzilai, S., Bergstrom, C., Coffey, J., Donovan, B., Kivinen, K., Kozyreva, A., & Wineburg, S. (2022). *Science education in an age of misinformation*. Stanford University.
<https://sciedandmisinfo.stanford.edu/>

Park, W. (2020). Beyond the “two cultures” in the teaching of disaster: or how disaster education and science education could benefit each other. *Educational Philosophy and Theory*, 52(13), 1434–1448.

Perrow, C. (1984). *Normal accidents: Living with high risk technologies*. Basic Books.

Pinch, T. J. (2012). How do we treat technical uncertainty in systems failure? The case of the Space Shuttle Challenger. In T. R. La Porte (Ed.), *Social responses to large technical systems: Control or anticipation* (pp. 143–158). Springer.

Rumbach, A., & Nemeth, J. (2018). Disaster risk creation in the Darjeeling Himalayas: Moving toward justice. *Environment and Planning E: Nature and Space*, 1(3), 340–362.

Schenk, L., Hamza, K. M., Enghag, M., Lundegård, I., Arvanitis, L., Haglund, K., & Wojcik, A. (2019). Teaching and discussing about risk: Seven elements of potential

significance for science education. *International Journal of Science Education*, 41(9), 1271–1286.

Invitation to Submit Opinion Piece

In order to make better educational use of the wide geographical and disciplinary reach of this *HPS&ST Note*, invitations are extended for readers to contribute opinion or position pieces or suggestions about any aspect of the past, present or future of HPS&ST studies.

Contributions can be sent direct to editor. Ideally, they might be pieces that are already on the web, in which case a few paragraphs introduction, with link to web site can be sent, or else the pieces will be put on the web with a link given in the Note.

They will be archived, and downloadable, in the OPINION folder at the HPS&ST web site [HERE](#):

Varia

● Vale, Trevor Levere (1944-2022)

[Trevor Levere](#) worked in the history of chemistry, as well as the history of exploration and science in the Canadian Arctic. Throughout his career, Trevor integrated instrument studies into many of his articles and chapters, as well as in several of his books such as *Martinus van Marum. Life and Work, vol. IV: Van Marum’s Scientific Instruments in Teyler’s Museum* (with G. L’E. Turner, 1973) and *Instruments and Experimentation in the History of Chemistry* (with F. L. Holmes, 2000),

Trevor was a beloved husband, father, grandfather, and colleague. He was recognised as an exceptional supervisor. In 2017 his former students presented him with a volume in his honour, [The Romance of Science](#), edited by Jed Buchwald and Larry Stewart.

● [European Society for the History of the Human Sciences](#) (ESHHS). The board of the ESHHS and local organizers Renato Foschi and Marco Innamorati are delighted to announce the dates for the next conference of the ESHHS Tuesday 4 July to Friday 7 July, 2023. Held at Villa Mirafiori in central Rome, which is home to the [Philosophy Department](#) of the Sapienza University.

● **Thomas Kuhn Lowell Lectures** (1951), *The Quest for Physical Theory* (George Reisch, ed.). These hitherto unpublished eight lectures (170 pp) were the foundation for Kuhn's *Structure of Scientific Revolution* (1962). Reisch has provided an informed 25 pp introduction to the Lectures and more generally to Kuhn's work. Available gratis [HERE](#)

● **History of Science Society (USA) Annual Conference**, Chicago, 17-20 Nov. 2022. Details [HERE](#)

● **History of Science Society (USA) Newsletter**, available [HERE](#)

PhD Award in HPS&ST:

We welcome publishing details of all PhDs awarded in the field of HPS&ST. Send details (name, title, abstract, supervisor, web link) to editor: m.matthews@unsw.edu.au

Linda Hall Library Fellowships

The [Linda Hall Library](#) is now accepting applications for its 2023-24 fellowship program. These fellowships provide graduate students, postdoctoral researchers, and independent scholars in the history of science and related humanities fields with financial support to explore the Library's outstanding science and engineering collections. Fellows also participate in a dynamic intellectual community alongside in-house experts and scholars from other Kansas City cultural and educational institutions.



The Linda Hall Library holds nearly half a million monographs and more than 43,000 journal titles documenting the history of science and technology from the 15th century to the present. Its collections are exceptionally strong in the

engineering disciplines, chemistry, and physics. In addition, the Library boasts extensive resources related to natural history, astronomy, earth science, environmental studies, aeronautics, life science, infrastructure studies, mathematics, and the history of the book.



The Library will once again be offering **residential fellowships** to support on-site research in Kansas City, as well as **virtual fellowships** for scholars working remotely using resources from the Library's digital collections. In either case, applicants may request up to four months of funding at a rate of \$3,000 per month for doctoral students and \$4,200 per month for postdoctoral researchers.

The Library is also offering several fellowships intended for specific groups of researchers, including:

- **The National Endowment for the Humanities (NEH) Postdoctoral Fellowship**, which provides nine months of residential funding (\$5,000 per month) to a postdoctoral scholar whose research explores the intersection of science and the humanities
- **The History of Science and Medicine Fellowship**, offered in partnership with the [Clendening History of Medicine Library](#) at the University of Kansas Medical Center, which provides one month of residential funding (\$3,000 per month) to a doctoral student whose research examines the intersecting histories of science and medicine
- **The Pearson Fellowship in Aerospace History**, which provides up to two months of residential funding (\$4,200 per month) to a postdoctoral scholar studying any aspect of aerospace history

- The **Presidential Fellowship in Bibliography**, which provides up to four months of residential funding (\$4,200 per month) to a postdoctoral scholar whose research focuses on the study of books and manuscripts as physical artifacts
- The **Ukraine Fellowship**, offered in partnership with the [UK-Ukraine Twinning Initiative](#), which provides up to two months of virtual funding (\$5,000 per month) to a Ukrainian doctoral student or postdoctoral scholar whose research would benefit from the Library's holdings.

Please share this announcement with graduate students, colleagues, or anyone else who might be interested in the Linda Hall Library's fellowship program. All application materials are due no later than January 20, 2023. For further information, visit the [Fellowships](#) page on our website or e-mail fellowships@lindahall.org.

New Journal: *History of Social Science*

A new journal, [History of Social Science](#), is published by the University of Pennsylvania Press on behalf of the [Society for the History of Recent Social Science](#).

History of Social Science offers an international forum for the examination of the transformations of the social sciences since the early twentieth century. The journal covers a variety of disciplines, from the core social sciences of economics, political science, and sociology, to disciplines with links to natural science, such as anthropology, geography, and psychology, and disciplines closer to the humanities, such as history and philosophy. Related fields, including area studies, business, communication studies, criminology, law, and linguistics, are also included under the journal's editorial scope.

An important editorial commitment of the journal is to solicit and cultivate scholarship on the history of the social sciences throughout the world, as well as work that traces the transnational circulation and mutual shaping of ideas, practices, and personnel.

The journal is now [accepting submissions](#). More information can be found on the journal's [website](#), including [Author Guidelines](#) and the [Editorial](#)

[Board](#). The first issue is slated to appear in Spring 2024.

The journal's sponsor is the Society for the History of Recent Social Science (HISRESS), which also hosts a small annual conference on the worldwide history of the social sciences in the twentieth century. Next year's symposium will be held in Uppsala, Sweden, in June; see the [call for papers](#) for more details.

Please [contact the journal editors](#) with submission inquiries or any other questions.

Jamie Cohen Cole, Philippe Fontaine, and Jeff Pooley (co-editors).

Recent HPS&ST Research Articles

Aikenhead, G. S. (2022). Humanistic school science: Research, policy, politics and classrooms. *Science Education*, 1–24.

<https://doi.org/10.1002/sce.21774> online first

Bertoldi, N. (2022). “Batesonian Mendelism” and “Pearsonian biometry”: shedding new light on the controversy between William Bateson and Karl Pearson. *HPLS*, 44, 49.

<https://doi.org/10.1007/s40656-022-00528-5>

de Arrieta, I.G. (2022). Beyond the infrared: a centenary of Heinrich Rubens's death. *EPJ H* 47, 11. <https://doi.org/10.1140/epjh/s13129-022-00044-x>

Del Santo, F., & Schwarzhans, E. (2022). “Philosophysics” at the University of Vienna: The (Pre-)History of Foundations of Quantum Physics in the Viennese Cultural Context. *Phys. Perspect.* 1-29. <https://doi.org/10.1007/s00016-022-00290-y>

Faize, F. A. (2022.) Assessing science teachers' understanding about the nature of scientific inquiry and its reflection in students' responses using the VASI questionnaire. *International Journal of Science Education*, 1-18.

<https://doi.org/10.1080/09500693.2022.2116959> online first

Hahn, K. T., & Gire, E. (2022). Waving arms around to teach quantum mechanics. *American Journal of Physics* 90, 778-786.

<https://doi.org/10.1119/5.0073946>

Huang, X., Qiao, C. (2022). Enhancing Computational Thinking Skills Through Artificial Intelligence Education at a STEAM High School.

Sci & Educ, 1-21. <https://doi.org/10.1007/s11191-022-00392-6> online first

Luggin, J. (2022). “Trust No One But Yourself”: William Gilbert’s Use of Experiment and Rejection of Authority, Reconsidered. *Perspectives on Science*, 1-25. https://doi.org/10.1162/posc_a_00564

Melville, W., Verma, G., Campbell, T. & Park, B.-Y. (2022). Challenging the Hegemony of Western Scientism in Science Teacher Education, *Journal of Science Teacher Education*, 33:7, 703-709, <https://doi.org/10.1080/1046560X.2022.2112130>

Novosyadlyj, B., Hnatyk, B., Kulinich, Y. et al. (2022). Samuil Kaplan and the development of astrophysical research at the Lviv University. *EPJ H* 47, 12. <https://doi.org/10.1140/epjh/s13129-022-00045-w>

Park, W., Brock, R. (2022). Is There a Limit to Resemblances? Teaching About Science and Pseudoscience From a Family Resemblance Perspective. *Sci & Educ*, 1-22. <https://doi.org/10.1007/s11191-022-00394-4> online first

Shan, Y. (2022). Philosophical foundations of mixed methods research. *Philosophy Compass*, 17(1), e12804. <https://doi.org/10.1111/phc3.12804>

Subramaniam, K. (2022). Pre-service Elementary Teachers’ Images of Scientific Practices: a Social, Epistemic, Conceptual, and Material Dimension Perspective. *Res Sci Educ*, 1-17. <https://doi.org/10.1007/s11165-022-10074-6> online first

Synak, N., Šabíková, N. & Masaryk, R. (2022). Correlations Among High School Students’ Beliefs about Conspiracy, Authoritarianism, and Scientific Literacy. *Sci & Educ*, 1-16. <https://doi.org/10.1007/s11191-022-00380-w> online first

Vinarski, M.V. (2022). Pattern Without Process: Eugen Smirnov and the Earliest Project of Numerical Taxonomy (1923–1938). *J Hist Biol*, 1-25. <https://doi.org/10.1007/s10739-022-09688-3>

Winsberg, E. (2022). Putting races on the ontological map: a close look at Spencer’s ‘new biologism’ of race. *Biol Philos* 37, 46. <https://doi.org/10.1007/s10539-022-09878-7>

Wray, K.B. (2022). Theodore Richards and the discovery of isotopes. *Found Chem*, 1-10.

<https://doi.org/10.1007/s10698-022-09449-4> (online first)

Recent HPS&ST Related Books

Ault Jr., Charles R. (2021). *Beyond Science Standards: Play, Art, Coherence, Community*. Maryland, MD: Rowman & Littlefield Publishers. ISBN: 978-1-4758-5997-3

“*Beyond Science Standards* captures a vision of science education both whimsical and serious. Ranging across examples from elementary to university level classrooms and grounded in philosophy and history, the stories address dimensions beyond the realm of bureaucratic standards. Its thesis brings into question the premise of scientific unity and its representation in school as notions of method, process, nature, and practice. Schools, no less than the sciences, profit from playful exploration—of musical instruments in fourth grade physical science, for example, and hotel lobby decorative rock in a college geology course. Aesthetic expression permeates geologic interpretation and evolutionary insight—in depicting dentition, for instance, in the history of the horse family and linking this history to changing landscapes. Participating in collecting local, high altitude weather data enhances trust in climate science, especially when the observations benefit the local farming community. Allied with historical examples of the conduct of science, *Beyond Science Standards* offers the reader inspiring stories of science teaching, varying from place to place, time to time, discipline to discipline, and purpose to purpose.” (From the Publisher)

More information [HERE](#)

Bashford, A. (2022). *The Huxleys: An Intimate History of Evolution*. Chicago, IL: Chicago University Press. ISBN: 9780226720111

“This momentous biography tells the story of the Huxleys: the Victorian natural historian T. H. Huxley (“Darwin’s Bulldog”) and his grandson, the scientist, conservationist, and zoologist Julian Huxley. Between them, they communicated to the world the great modern story of the theory of evolution by natural selection. In *The Huxleys*, celebrated historian Alison Bashford writes seamlessly about these

omnivorous intellects together, almost as if they were a single man whose long, vital life bookended the colossal shifts in world history from the age of sail to the Space Age, and from colonial wars to world wars to the cold war.

“The Huxleys’ specialty was evolution in all its forms—at the grandest level of species, deep time, the Earth, and at the most personal and intimate. They illuminated the problems and wonders of the modern world and they fundamentally shaped how we see ourselves, as individuals and as a species.

“But perhaps their greatest subject was themselves. Bashford’s engaging, brilliantly ambitious book interweaves the Huxleys’ momentous public achievements with their private triumphs and tragedies. The result is the history of a family, but also a history of humanity grappling with its place in nature. This book shows how much we owe—for better or worse—to the unceasing curiosity, self-absorption, and enthusiasms of a small, strange group of men and women.” (From the Publisher)

More information [HERE](#)

Benson, Michael T. (2022). *Daniel Coit Gilman and the Birth of the American Research University*. Baltimore, MD: Johns Hopkins University Press. ISBN: 9781421444161

“Daniel Coit Gilman, a Yale-trained geographer who first worked as librarian at his alma mater, led a truly remarkable life. He was selected as the third president of the University of California; was elected as the first president of Johns Hopkins University, where he served for twenty-five years; served as one of the original founders of the Association of American Universities; and—at an age when most retired—was hand-picked by Andrew Carnegie to head up his eponymous institution in Washington, DC.

“In *Daniel Coit Gilman and the Birth of the American Research University*, Michael T. Benson argues that Gilman's enduring legacy will always be as the father of the modern research university—a uniquely American invention that remains the envy of the entire world. In the past half-century, nothing has

been written about Gilman that takes into account his detailed journals, reviews his prodigious correspondence, or considers his broad external board service. This book fills an enormous void in the history of the birth of the “new” American system of higher education, especially as it relates to graduate education. The late 1800s, Benson points out, is one of the most pivotal periods in the development of the American university model; this book reveals that there is no more important figure in shaping that model than Daniel Coit Gilman.

“Benson focuses on Gilman's time deliberating on, discussing, developing, refining, and eventually implementing the plan that brought the modern research university to life in 1876. He also explains how many university elements that we take for granted—the graduate fellowships, the emphasis on primary investigations and discovery, the funding of the best laboratory and research spaces, the scholarly journals, the university presses, the sprawling health sciences complexes with teaching hospitals—were put in place by Gilman at Johns Hopkins University. Ultimately, the book shows, Gilman and his colleagues forced all institutions to reexamine their own model and to make the requisite changes to adapt, survive, thrive, compete, and contribute.” (From the Publisher)

More information [HERE](#) a

Boomsma, Jacobus J. (2022). *Domains and Major Transitions of Social Evolution*. Oxford, UK: Oxford University Press. ISBN: 9780198746171

“Evolutionary change is usually incremental and continuous, but some increases in organizational complexity have been radical and divisive. Evolutionary biologists, who refer to such events as “major transitions”, have not always appreciated that these advances were novel forms of pairwise commitment that subjugated previously independent agents. Inclusive fitness theory convincingly explains cooperation and conflict in societies of animals and free-living cells, but to deserve its eminent status it should also capture how major transitions originated: from prokaryote cells to eukaryote cells, via differentiated multicellularity, to colonies with specialized queen and worker castes. As yet, no attempt

has been made to apply inclusive fitness principles to the origins of these events.

“*Domains and Major Transitions of Social Evolution* develops the idea that major evolutionary transitions involved new levels of informational closure that moved beyond looser partnerships. Early neo-Darwinians understood this principle, but later social gradient thinking obscured the discontinuity of life's fundamental organizational transitions. The author argues that the major transitions required maximal kinship in simple ancestors - not conflict reduction in already elaborate societies. Reviewing more than a century of literature, he makes testable predictions, proposing that open societies and closed organisms require very different inclusive fitness explanations. It appears that only human ancestors lived in societies that were already complex before our major cultural transition occurred. We should therefore not impose the trajectory of our own social history on the rest of nature.

“This thought-provoking text is suitable for graduate-level students taking courses in evolutionary biology, behavioural ecology, organismal developmental biology, and evolutionary genetics, as well as professional researchers in these fields. It will also appeal to a broader, interdisciplinary audience, including the social sciences and humanities.” (From the Publisher)

More information [HERE](#)

Cellamare, D. & Mantovani, M. (2022) *Descartes in the Classroom: Teaching Cartesian Philosophy in the Early Modern Age*. Leiden: Brill. ISBN: 978-90-04-52326-5

“The volume offers the first large-scale study of the teaching of Descartes’ philosophy in the early modern age. Its twenty chapters explore the clash between Descartes’ “new” philosophy and the established pedagogical practices and institutional concerns, as well as the various strategies employed by Descartes’ supporters in order to communicate his ideas to their students. The volume considers a vast array of topics, sources, and institutions, across the borders of countries and confessions, both within and without the university setting

(public conferences, private tutorials, distance learning by letter) and enables us thereby to reconsider from a fresh perspective the history of early modern philosophy and education.”
(From the Publisher)

More information [HERE](#)

Guenther, Katja (2022). *The Mirror and the Mind: A History of Self-Recognition in the Human Sciences*. Princeton, NJ: Princeton University Press. ISBN: 9780691237268

“Since the late eighteenth century, scientists have placed subjects—humans, infants, animals, and robots—in front of mirrors in order to look for signs of self-recognition. Mirrors served as the possible means for answering the question: What makes us human? In *The Mirror and the Mind*, Katja Guenther traces the history of the mirror self-recognition test, exploring how researchers from a range of disciplines—psychoanalysis, psychiatry, developmental and animal psychology, cybernetics, anthropology, and neuroscience—came to read the peculiar behaviors elicited by mirrors. Investigating the ways mirrors could lead to both identification and misidentification, Guenther looks at how such experiments ultimately failed to determine human specificity.

“The mirror test was thrust into the limelight when Charles Darwin challenged the idea that language sets humans apart. Thereafter the mirror, previously a recurrent if marginal scientific tool, became dominant in attempts to demarcate humans from other animals. But because researchers could not rely on language to determine what their nonspeaking subjects were experiencing, they had to come up with significant innovations, including notation strategies, testing protocols, and the linking of scientific theories across disciplines. From the robotic tortoises of Grey Walter and the mark test of Beulah Amsterdam and Gordon Gallup, to anorexia research and mirror neurons, the mirror test offers a window into the emergence of such fields as biology, psychology, psychiatry, animal studies, cognitive science, and neuroscience.

“*The Mirror and the Mind* offers an intriguing history of experiments in self-awareness and

the advancements of the human sciences across more than a century.” (From the Publisher)

More information [HERE](#)

Lüthy, C. & Nicoli, E. (Eds.) (2022). *Atoms, Corpuscles and Minima in the Renaissance*. Leiden: Brill. ISBN: 978-90-04-52892-5

“The Renaissance witnessed an upsurge in explanations of natural events in terms of invisibly small particles – atoms, corpuscles, minima, monads and particles. The reasons for this development are as varied as are the entities that were proposed. This volume covers the period from the earliest commentaries on Lucretius’ *De rerum natura* to the sources of Newton’s alchemical texts. Contributors examine key developments in Renaissance physiology, meteorology, metaphysics, theology, chymistry and historiography, all of which came to assign a greater explanatory weight to minute entities. These contributions show that there was no simple ‘revival of atomism’, but that the Renaissance confronts us with a diverse and conceptually messy process. Contributors are: Stephen Clucas, Christoph Lüthy, Craig Martin, Elisabeth Moreau, William R. Newman, Elena Nicoli, Sandra Plastina, Kuni Sakamoto, Jole Shackelford, and Leen Spruit.

More information [HERE](#)

McGrath, Alister E. (2022). *Natural Philosophy: On Retrieving a Lost Disciplinary Imaginary*. Oxford, UK: Oxford University Press. ISBN: 9780192865731

“This book argues for the retrieval of 'natural philosophy', a concept that faded into comparative obscurity as individual scientific disciplines became established and institutionalized. Natural philosophy was understood in the early modern period as a way of exploring the human relationship with the natural world, encompassing what would now be seen as the distinct disciplines of the natural sciences, mathematics, music, philosophy, and theology.

“The first part of the work represents a critical conversation with the tradition, identifying the essential characteristics of natural philosophy,

particularly its emphasis on both learning about and learning from nature. After noting the factors which led to the disintegration of natural philosophy during the nineteenth century, the second part of the work sets out the reasons why natural philosophy should be retrieved, and a creative and innovative proposal for how this might be done. This draws on Karl Popper's 'Three Worlds' and Mary Midgley's notion of using multiple maps in bringing together the many aspects of the human encounter with the natural world. Such a retrieved or 're-imagined' natural philosophy is able to encourage both human attentiveness and respectfulness towards Nature, while enfolding both the desire to understand the natural world, and the need to preserve the affective, imaginative, and aesthetic aspects of the human response to nature.” (From the Publisher)

More information [HERE](#)

Matthews, Michael R. (2022). *The Scientific Background to Modern Philosophy*, second enlarged edition, Hackett Publishing Company, Indianapolis. ISBN: 978-1-64792-086-9

“The book illuminates through a collection of works from key thinkers in natural philosophy, the central role science played in developing modern philosophical thought. The first edition (1989) was widely adopted, selling 55,000+ copies. This revised and expanded edition includes many new translations and incorporates works by foundational eighteenth- and nineteenth-century thinkers that were not in the first edition. These include Jean-Baptiste, le Rond d’Alembert, Denis Diderot, Émilie Du Châtelet, Jean-Jacques Rousseau, Joseph Priestley, Immanuel Kant, Carl Linnaeus, William Paley, and Charles Darwin.

‘Introductions and commentary are provided for all selections.

‘The new additions provide students with a more comprehensive understanding of the scientific context in which the major philosophical works of the modern era were written and complement the selections from works by Nicolaus Copernicus, Francis Bacon, Galileo Galilei, René Descartes, Robert Boyle,

Christiaan Huygens, and Isaac Newton that are retained from the first edition.

Details: [HERE](#)

Mele, Alfred R. (2022). *Free Will: An Opinionated Guide*. Oxford, UK: Oxford University Press. ISBN: 9780197574232

“What did you do a moment ago? What will you do after you read this? Are you deciding as we speak, or is something else going on in your brain or elsewhere in your body that is determining your actions? Stopping to think this way can freeze us in our tracks. A lot in the world feels far beyond our control—the last thing we need is to question whether we make our own choices in the way we usually assume we do. Questions about free will are so major and consequential that we may prefer not to think about them at all, lest we feel completely lost and unsure of everything we thought we knew!

“Free will is certainly important, but it does not need to be daunting. *Free Will: An Opinionated Guide* offers a clear and straightforward introduction to this vexing topic. Drawing on decades of extensive research in philosophy, neuroscience, and psychology, internationally recognized authority on free will Alfred R. Mele explains and explores the most prominent theories, puzzles, and arguments about free will, all the while presenting his own distinctive take on the topic.

“Mele's use of attention-grabbing thought experiments brings deep philosophical issues to life. He tackles the questions already on readers' minds and some they will encounter for the first time, on topics like determinism, neuroscience, and control. Whether this is the only book on free will you will read, or just the beginning of a deeper investigation, you will never think about free will, or the decisions you believe you're making, in the same ways again.” (From the Publisher)

More information at:

<https://tinyurl.com/5ba96vb2>

Mladenovic, B (Ed.) (2022). *The Last Writings of Thomas S. Kuhn: Incommensurability in Science*.

Chicago, IL: The University of Chicago Press. ISBN: 9780226822747

“This book contains the text of Thomas S. Kuhn’s unfinished book, *The Plurality of Worlds: An Evolutionary Theory of Scientific Development*, which Kuhn himself described as a return to the central claims of *The Structure of Scientific Revolutions* and the problems that it raised but did not resolve. *The Plurality of Worlds* is preceded by two related texts that Kuhn publicly delivered but never published in English: his paper “Scientific Knowledge as Historical Product” and his Shearman Memorial Lectures, “The Presence of Past Science.” An introduction by the editor describes the origins and structure of *The Plurality of Worlds* and sheds light on its central philosophical problems.

“Kuhn’s aims in his last writings are bold. He sets out to develop an empirically grounded theory of meaning that would allow him to make sense of both the possibility of historical understanding and the inevitability of incommensurability between past and present science. In his view, incommensurability is fully compatible with a robust notion of the real world that science investigates, the rationality of scientific change, and the idea that scientific development is progressive.” (From the Publisher)

More information [HERE](#)

Nersessian, Nancy J. (2022). *Interdisciplinarity in the Making: Models and Methods in Frontier Science*. Cambridge, MA: The MIT Press. ISBN: 9780262544665

“In this first full-scale, long-term cognitive ethnography by a philosopher of science, Nancy J. Nersessian offers an account of how scientists at the interdisciplinary frontiers of bioengineering create novel problem-solving methods. Bioengineering scientists model complex dynamical biological systems using concepts, methods, materials, and other resources drawn primarily from engineering. They aim to understand these systems sufficiently to control or intervene in them. What Nersessian examines here is how cutting-edge bioengineering scientists integrate the cognitive, social, material, and cultural

dimensions of practice. Her findings and conclusions have broad implications for researchers in philosophy, science studies, cognitive science, and interdisciplinary studies, as well as scientists, educators, policy makers, and funding agencies.

“In studying the epistemic practices of scientists, Nersessian pushes the boundaries of the philosophy of science and cognitive science into areas not ventured before. She recounts a decades-long, wide-ranging, and richly detailed investigation of the innovative interdisciplinary modeling practices of bioengineering researchers in four university laboratories. She argues and demonstrates that the methods of cognitive ethnography and qualitative data analysis, placed in the framework of distributed cognition, provide the tools for a philosophical analysis of how scientific discoveries arise from complex systems in which the cognitive, social, material, and cultural dimensions of problem-solving are integrated into the epistemic practices of scientists. Specifically, she looks at how interdisciplinary environments shape problem-solving. Although Nersessian's case material is drawn from the bioengineering sciences, her analytic framework and methodological approach are directly applicable to scientific research in a broader, more general sense, as well.” (From the Publisher)

More information [HERE](#)

Ober, Josiah (2022). *The Greeks and the Rational: The Discovery of Practical Reason*. Oakland, CA: University of California Press. ISBN: 9780520380165

“The Greek discovery of practical reason, as the skilled performance of strategic thinking in public and private affairs, was an intellectual breakthrough that remains both a feature of and a bug in our modern world. Countering arguments that rational choice-making is a contingent product of modernity, *The Greeks and the Rational* traces the long history of theorizing rationality back to ancient Greece.

“In this book, Josiah Ober explores how ancient Greek sophists, historians, and philosophers developed sophisticated and systematic ideas about practical reason. At the

same time, they recognized its limits—that not every decision can be reduced to mechanistic calculations of optimal outcomes. Ober finds contemporary echoes of this tradition in the application of game theory to political science, economics, and business management. *The Greeks and the Rational* offers a striking revisionist history with widespread implications for the study of ancient Greek civilization, the history of thought, and human rationality itself.” (From the Publisher)

More information [HERE](#)

Pelczar, Michael (2022). *Phenomenalism: A Metaphysics of Chance and Experience*. Oxford, UK: Oxford University Press. ISBN: 9780192868732

“J.S. Mill famously equated physical things with “permanent possibilities of sensation.” This view, known as phenomenalism, holds that a rock is a tendency for experiences to occur as they do when people perceive a rock, and similarly for all other physical things. In *Phenomenalism*, Michael Pelczar develops Mill's theory in detail, defends it against the objections responsible for its current unpopularity, and uses it to shed light on important questions in metaphysics, the philosophy of science, and the philosophy of mind. Identifying physical things with possibilities of sensation establishes a transparent connection between the world of physics and the world of sense, provides an attractive alternative to currently fashionable structuralist and panpsychist metaphysics, offers a fresh perspective on the problem of consciousness, and yields a satisfying theory of perception, all by taking two things notoriously resistant to reduction, chance and experience, and constructing everything else out of them.” (From the Publisher)

More information [HERE](#)

Petroski, Henry (2022). *Force: What It Means to Push and Pull, Slip and Grip, Start and Stop*. New Haven, CT: Yale University Press. ISBN: 9780300260793

“*Force* explores how humans interact with the material world in the course of their everyday activities. This book for the general reader also

considers the significance of force in shaping societies and cultures.

“Celebrated author Henry Petroski delves into the ongoing physical interaction between people and things that enables them to stay put or causes them to move. He explores the range of daily human experience whereby we feel the sensations of push and pull, resistance and assistance. The book is also about metaphorical force, which manifests itself as pressure and relief, achievement and defeat.

“Petroski draws from a variety of disciplines to make the case that force—represented especially by our sense of touch—is a unifying principle that pervades our lives. In the wake of a prolonged global pandemic that increasingly cautioned us about contact with the physical world, Petroski offers a new perspective on the importance of the sensation and power of touch.” (From the Publisher)

More information [HERE](#)

Roberts, B. (2022). *Reversing the Arrow of Time*. Cambridge: Cambridge University Press. ISBN: 9781009122139

“The arrow of time refers to the curious asymmetry that distinguishes the future from the past. *Reversing the Arrow of Time* argues that there is an intimate link between the symmetries of 'time itself' and time reversal symmetry in physical theories, which has wide-ranging implications for both physics and its philosophy. This link helps to clarify how we can learn about the symmetries of our world; how to understand the relationship between symmetries and what is real, and how to overcome pervasive illusions about the direction of time. Roberts explains the significance of time reversal in a way that intertwines physics and philosophy, to establish what the arrow of time means and how we can come to know it. This book is both mathematically and philosophically rigorous yet remains accessible to advanced undergraduates in physics and philosophy of physics. This title is also available as Open Access on Cambridge Core.” (From the Publisher)

More information [HERE](#)

Ruse, M. (2022). *Understanding Natural Selection* (Understanding Life). Cambridge: Cambridge University Press. ISBN: 9781009090865

“Natural selection, as introduced by Charles Darwin in the *Origin of Species* (1859), has always been a topic of great conceptual and empirical interest. This book puts Darwin's theory of evolution in historical context showing that, in important respects, his central mechanism of natural selection gives the clue to understanding the nature of organisms. Natural selection has important implications, not just for the understanding of life's history – single-celled organism to man – but also for our understanding of contemporary social norms, as well as the nature of religious belief. The book is written in clear, non-technical language, appealing not just to philosophers, historians, and biologists, but also to general readers who find thinking about important issues both challenging and exciting.” (From the Publisher)

More information [HERE](#)

Schwartz, Jeffrey H. (Ed.) (2022). *Rethinking Human Evolution*. Cambridge, MA: The MIT Press. ISBN: 9780262546744

“The study of human evolution often seems to rely on scenarios and received wisdom rather than theory and methodology, with each new fossil or molecular analysis interpreted as supporting evidence for the presumed lineage of human ancestry. We might wonder why we should pursue new inquiries if we already know the story. Is paleoanthropology an evolutionary science? Are analyses of human evolution biological? In this volume, contributors from disciplines that range from paleoanthropology to philosophy of science consider the disconnect between human evolutionary studies and the rest of evolutionary biology. All of the contributors reflect on their own research and its disciplinary context, considering how their fields of inquiry can move forward in new ways. The goal is to encourage a more multifaceted intellectual environment for the understanding of human evolution.

“Topics discussed include paleoanthropology's history of procedural idiosyncrasies; the role of mind and society in our evolutionary past; humans as large mammals rather than a special case; genomic analyses; computational approaches to phylogenetic reconstruction; descriptive morphology versus morphometrics; and integrating insights from archaeology into the interpretation of human fossils.” (From the Publisher)

More information [HERE](#)

Shan, Yafeng (Ed.) (2022). *New Philosophical Perspectives on Scientific Progress*. Abingdon, UK: Routledge. ISBN: 9780367760557

“This collection of original essays offers a comprehensive examination of scientific progress, which has been a central topic in recent debates in philosophy of science.

“Traditionally, debates over scientific progress have focused on different methodological approaches, notably the epistemic and semantic approaches. The chapters in Part I of the book examine these two traditional approaches, as well as the newly revived functional and newly developed noetic approaches. Part II features in-depth case studies of scientific progress from the history of science. The chapters cover individual sciences including physics, chemistry, evolutionary biology, seismology, psychology, sociology, economics, and medicine. Finally, Part III of the book explores important issues from contemporary philosophy of science. These chapters address the implications of scientific progress for the scientific realism/anti-realism debate, incommensurability, values in science, idealisation, scientific speculation, interdisciplinarity, and scientific perspectivalism.

“*New Philosophical Perspectives on Scientific Progress* will be of interest to researchers and advanced students working on the history and philosophy of science.” (From the Publisher)

More information [HERE](#)

Tarrant, N. (2022). *Defining Nature's Limits: The Roman Inquisition and the Boundaries of Science*.

Chicago, IL: The University of Chicago Press. ISBN: 9780226819426

“Neil Tarrant challenges conventional thinking by looking at the longer history of censorship, considering a five-hundred-year continuity of goals and methods stretching from the late eleventh century to well into the sixteenth.

“Unlike earlier studies, *Defining Nature's Limits* engages the history of both learned and popular magic. Tarrant explains how the church developed a program that sought to codify what was proper belief through confession, inquisition, and punishment and prosecuted what they considered superstition or heresy that stretched beyond the boundaries of religion. These efforts were continued by the Roman Inquisition, established in 1542. Although it was designed primarily to combat Protestantism, from the outset the new institution investigated both practitioners of “illicit” magic and inquiries into natural philosophy, delegitimizing certain practices and thus shaping the development of early modern science. Describing the dynamics of censorship that continued well into the post-Reformation era, *Defining Nature's Limits* is revisionist history that will interest scholars of the history science, the history of magic, and the history of the church alike.” (From the Publisher)

More information [HERE](#)

Vickers, Peter (2022). *Identifying Future-Proof Science*. Oxford, UK: Oxford University Press. ISBN: 9780192862730

“Is science getting at the truth? The sceptics - those who spread doubt about science - often employ a simple argument: scientists were 'sure' in the past, and then they ended up being wrong. Through a combination of historical investigation and philosophical-sociological analysis, *Identifying Future-Proof Science* defends science against this potentially dangerous scepticism. Indeed, we can confidently identify many scientific claims that are future-proof: they will last forever, so long as science continues. How do we identify future-proof claims? This appears to be a new question for science scholars, and not an unimportant one. Peter Vickers argues that the

best way to identify future-proof science is to avoid any attempt to analyse the relevant first-order scientific evidence, instead focusing purely on second-order evidence. Specifically, a scientific claim is future-proof when the relevant scientific community is large, international, and diverse, and at least 95% of that community would describe the claim as a 'scientific fact'. In the entire history of science, no claim meeting these criteria has ever been overturned, despite enormous opportunity.” (From the Publishers)

More information [HERE](#)

Walker, R. E. (2022). *Beauty and the Brain: The Science of Human Nature in Early America*. Chicago, IL: The University of Chicago Press. ISBN: 9780226822563

“Between the 1770s and the 1860s, people all across the globe relied on physiognomy and phrenology to evaluate human worth. These once-popular but now discredited disciplines were based on a deceptively simple premise: that facial features or skull shape could reveal a person’s intelligence, character, and personality. In the United States, these were culturally ubiquitous sciences that both elite thinkers and ordinary people used to understand human nature.

“While the modern world dismisses phrenology and physiognomy as silly and debunked disciplines, *Beauty and the Brain* shows why they must be taken seriously: they were the intellectual tools that a diverse group of Americans used to debate questions of race, gender, and social justice. While prominent intellectuals and political thinkers invoked these sciences to justify hierarchy, marginalized people and progressive activists deployed them for their own political aims, creatively interpreting human minds and bodies as they fought for racial justice and gender equality. Ultimately, though, physiognomy and phrenology were as dangerous as they were popular. In addition to validating the idea that external beauty was a sign of internal worth, these disciplines often appealed to the very people who were damaged by their prejudicial doctrines. In taking physiognomy and phrenology seriously, *Beauty and the Brain* recovers a vibrant—if largely forgotten—

cultural and intellectual universe, showing how popular sciences shaped some of the greatest political debates of the American past.” (From the Publisher)

More information [HERE](#)

Wehrman, Andrew M. (2022). *The Contagion of Liberty: The Politics of Smallpox in the American Revolution*. Baltimore, MD: Johns Hopkins University Press. ISBN: 9781421444666

“The Revolutionary War broke out during a smallpox epidemic, and in response, General George Washington ordered the inoculation of the Continental Army. But Washington did not have to convince fearful colonists to protect themselves against smallpox—they were the ones demanding it. In *The Contagion of Liberty*, Andrew M. Wehrman describes a revolution within a revolution, where the violent insistence for freedom from disease ultimately helped American colonists achieve independence from Great Britain.

“Inoculation, a shocking procedure introduced to America by an enslaved African, became the most sought-after medical procedure of the eighteenth century. The difficulty lay in providing it to all Americans and not just the fortunate few. Across the colonies, poor Americans rioted for equal access to medicine, while cities and towns shut down for quarantines. In Marblehead, Massachusetts, sailors burned down an expensive private hospital just weeks after the Boston Tea Party.

“This thought-provoking history offers a new dimension to our understanding of both the American Revolution and the origins of public health in the United States. The miraculous discovery of vaccination in the early 1800s posed new challenges that upended the revolutionaries' dream of disease eradication, and Wehrman reveals that the quintessentially American rejection of universal health care systems has deeper roots than previously known. During a time when some of the loudest voices in the United States are those clamoring against efforts to vaccinate, this richly documented book will appeal to anyone interested in the history of medicine and politics, or who has questioned government

action (or lack thereof) during a pandemic.”
(From the Publisher)

More information [HERE](#)

Winther, R. (2022). *Our Genes: A Philosophical Perspective on Human Evolutionary Genomics*. Cambridge: Cambridge University Press. ISBN: 9781316756324

“Situated at the intersection of natural science and philosophy, *Our Genes* explores historical practices, investigates current trends, and imagines future work in genetic research to answer persistent, political questions about human diversity. Readers are guided through fascinating thought experiments, complex measures and metrics, fundamental evolutionary patterns, and in-depth treatment of exciting case studies. The work culminates in a philosophical rationale, based on scientific evidence, for a moderate position about the explanatory power of genes that is often left unarticulated. Simply put, human evolutionary genomics - our genes - can tell us much about who we are as individuals and as collectives. However, while they convey scientific certainty in the popular imagination, genes cannot answer some of our most important questions. Alternating between an up-close and a zoomed-out focus on genes and genomes, individuals and collectives, species and populations, *Our Genes* argues that the answers we seek point to rich, necessary work ahead.”
(From the Publisher)

More information [HERE](#)

Authors of HPS&ST-related papers and books are invited to bring them to attention of the Newsletter's assistant editor Paulo Maurício (paulo.asterix@gmail.com) for inclusion in these sections.

Coming HPS&ST Related Conferences

November 10-13, 2022, Philosophy of Science Association (USA), Annual Conference, Pittsburgh
Details [HERE](#)

January 14-17, 2023, American Association of Physics Teachers, Winter Meeting, Portland OR.

Details [HERE](#)

March 2-6, 2023, Philosophy of Education Society (USA), Annual Conference, Chicago
Details [HERE](#)

March 16-18, 2023, 9th Integrated History and Philosophy of Science Conference, University of South Carolina, Columbia SC.
Details [HERE](#)

April 18-21, 2023, NARST Annual Conference, Chicago
Details [HERE](#)

April 20-21, Conference *Gravitational Constant: From Local to Universal*, St Andrews, Scotland
Details [HERE](#)

June 9-11, 2023, Eighth Annual Conference on the History of Recent Social Science, Uppsala, Sweden
Details [HERE](#)

June 27-30, 2023, ASERA Annual Conference, Cains, Australia
Details [HERE](#)

July 24-29, 2023, 17th DLMPST Congress, University of Buenos Aires
Information: Pablo Lorenzano, [HERE](#)

August 9-11, 2023, IHPST-LA regional conference, Porto Alegre, Brazil
Details [HERE](#)

August 14-18, 2023, International Committee for History of Technology, 50th Conference, Tallinn, Estonia
Details [HERE](#)

August 29-Sept.3, 2023, ESERA biennial conference, Cappadocia, Turkey
Details [HERE](#)

HPS&ST Related Organisations and Websites

[IUHPST](#) – International Union of History, Philosophy, Science, and Technology

[DLMPST](#) – Division of Logic, Mathematics, Philosophy, Science, and Technology

[DHST](#) – Division of History, Science, and Technology

[IHPST](#) – International History, Philosophy, and Science Teaching Group

[NARST](#) - National Association for Research in Science Teaching

[ESERA](#) - European Science Education Research Association

[ASERA](#) - Australasian Science Education Research Association
[ICASE](#) - International Council of Associations for Science Education
[UNESCO](#) – Education
[HSS](#) – History of Science Society
[ESHS](#) – European Society for the History of Science
[AHA](#) – American History Association
[ACS HIST](#) – American Chemical Society Division of the History of Chemistry
[GWMT](#) - Gesellschaft für Geschichte der Wissenschaften, der Medizin und der Technik
[ISHEASTME](#) – International Society for the History of East Asian History of Science Technology and Medicine
[EASE](#) - East-Asian Association for Science Education
[BSHS](#) – British Society for History of Science
[EPSA](#) - European Philosophy of Science Association
[AAHPSSS](#) - The Australasian Association for the History, Philosophy, and Social Studies of Science
)

[HOPOS](#) – International Society for the History of Philosophy of Science
[PSA](#) – Philosophy of Science Association
[BAHPS](#) - Baltic Association for the History and Philosophy of Science
[BSPS](#) – The British Society for the Philosophy of Science
[SPSP](#) - The Society for Philosophy of Science in Practice
[ISHPSB](#) - The International Society for the History, Philosophy, and Social Studies of Biology
[PES](#) – The Philosophy of Education Society (USA)

The above list is updated and kept on the HPS&ST website at: [HERE](#)

HPS&ST related organizations wishing their web page to be added to the list should contact assistant editor Paulo Maurício (paulo.asterix@gmail.com)

HPS&ST NEWSLETTER STAFF

Editor
Assistant Editor
Assistant Editor (Publications & Website
Regional Assistant Editor (North America)
Regional Assistant Editor (Latin America)
Regional Assistant Editor (Asia)

[Michael Matthews](#)
[Nathan Oseroff-Spicer](#)
[Paulo Maurício](#)
[Sophia Jeong](#)

[Nathan Lima](#)

[Huang Xiao](#)