

Globalizing History and Philosophy of Science: Problems and Prospects (21–22 August 2014)

Jointly organized by Asia Research Institute, National University of Singapore; Center for Dialogue, La Trobe University, Australia and Situating Science Strategic Knowledge Cluster in partnership with University of King's College, Canada

21 AUGUST 2014 (THURSDAY)

09:15 – 9:30	REGISTRATION
09:30 – 9:45	WELCOME & INTRODUCTORY REMARKS
	<p>Prasenjit Duara Asia Research Institute, National University of Singapore Gordon McOuat University of King's College/Dalhousie University, Canada Alberto Gomes La Trobe University, Australia Arun Bala Asia Research Institute, National University of Singapore</p>
9:45 – 11:00	KEYNOTE ADDRESS
<i>Chairperson</i>	Prasenjit Duara Asia Research Institute, National University of Singapore
09:45	Beyond the Civilization Paradigm: Reflections on the Indian Ocean (and Elsewhere), 1400-1800 Sanjay Subrahmanyam University of California-Los Angeles (UCLA), USA
10:45	QUESTIONS & ANSWERS
11:00 – 11:30	TEA BREAK
11:30 – 13:00	PANEL 1 – MATTERS OF MEDICINE
<i>Chairperson</i>	Alberto Gomes La Trobe University, Australia
11:30	Ecological Themes in Traditional Indian and Chinese Medicine Andrew Brennan La Trobe University, Australia
12:00	Translating South Asian Medicinal Knowledge for European Consumption: Three Examples from Southwestern India, 16th-18th Centuries Kapil Raj École des Hautes Études en Sciences Sociales, France
12:30	QUESTIONS & ANSWERS
13:00 – 14:00	LUNCH
14:00 – 15:30	PANEL 2 – ABOUT HISTORICAL METHODOLOGY
<i>Chairperson</i>	Arun Bala Asia Research Institute, National University of Singapore
14:00	#Hashtag Histories of Science: Remaking Locality, Rethinking the Global Carla Nappi University of British Columbia, Canada
14:30	The Global Turn in the History of Science: Concepts and Categories Fa-ti Fan Binghamton University, USA
15:00	QUESTIONS & ANSWERS
15:30 – 16:00	TEA BREAK
16:00 – 17:30	PANEL 3 – KNOWLEDGE CROSSING DIVIDES
<i>Chairperson</i>	Karel Davids VU University Amsterdam, Netherlands
16:00	After Travel and Contact: The Sciences of Race in the Pacific, South-east Asia and Southern Africa Sujit Sivasundaram University of Cambridge, UK
16:30	A Great Data Divergence? Humboldtian Science in the Context of Global Economic History Jessica Ratcliff Yale-NUS College, National University of Singapore
17:00	QUESTIONS & ANSWERS
17:30	END OF DAY 1
18:00 – 20:00	CONFERENCE DINNER (For Speakers, Chairpersons & Invited Guests)

Globalizing History and Philosophy of Science: Problems and Prospects (21–22 August 2014)

Jointly organized by Asia Research Institute, National University of Singapore; Center for Dialogue, La Trobe University, Australia and Situating Science Strategic Knowledge Cluster in partnership with University of King's College, Canada

22 AUGUST 2014 (FRIDAY)

09:15 – 09:30	REGISTRATION
09:30 – 11:00	PANEL 4 – SHARING PRACTICES
<i>Chairperson</i>	Carla Nappi University of British Columbia, Canada
09:30	Lateral “Gene” Transfer: A (Perhaps Unsuccessful) Model of Knowledge Exchange in Globalized Networks Gordon McOuat University of King’s College/Dalhousie University, Canada
10:00	Knowledge Practices and ‘Globalizing History’ Karel Davids VU University Amsterdam, Netherlands
10:30	QUESTIONS & ANSWERS
11:00 – 11:30	TEA BREAK
11:30 – 13:00	PANEL 5 – THE GLOBAL AND THE LOCAL
<i>Chairperson</i>	Sujit Sivasundram National University of Singapore
11:30	Tribal Scientists: Indigenous Epistemologies and the Philosophy of Science Alberto Gomes La Trobe University, Australia
12:00	Global Philosophy of Science: Roots, Problems and Prospects Meng Jianwei University of Chinese Academy of Sciences, China
12:30	QUESTIONS & ANSWERS
13:00 – 14:00	LUNCH
14:00 – 15:30	PANEL 6 – NETWORKS OF EXCHANGE
<i>Chairperson</i>	Kapil Raj École des Hautes Études en Sciences Sociales, France
14:00	How Does Science Travel? Axel Gelfert National University of Singapore
14:30	Commerce and the Cult of Khizr: Foregrounding a Sacred Geography of Healing in the Indian Ocean World Lauren Minsky New York University, Abu Dhabi
15:00	QUESTIONS & ANSWERS
15:30 – 16:00	TEA BREAK
16:00 – 17:30	PANEL 7 – MATHEMATICS AND ASTRONOMY
<i>Chairperson</i>	Gordon McOuat University of King’s College/ Dalhousie University, Canada
16:00	Philosophy of Indian Mathematics (via SKYPE) Sundar Sarukkai Manipal University, India
16:30	Asian Astronomical Traditions and the Scientific Revolution: Exploring Underground Connections Arun Bala Asia Research Institute, National University of Singapore
17:00	QUESTIONS & ANSWERS
17:30 – 17:40	BREAK
17:40 – 18:30	DISCUSSION & MOVING FORWARD
<i>Chairperson</i>	Arun Bala Asia Research Institute, National University of Singapore
18:30	END OF CONFERENCE

**Beyond the Civilization Paradigm:
Reflections on the Indian Ocean (and Elsewhere), 1400-1800**

Sanjay Subrahmanyam

Department of History, University of California-Los Angeles, USA

subrahma@history.ucla.edu

For much of the twentieth century, the idea of organizing world history around civilizations as building blocks dominated. Whether written in a triumphalist mode or a defensive one, this essentialist paradigm which was firmly put in place by authorities like Arnold Toynbee (and to a certain extent Max Weber), found a new lease of life after 1950, and once again after 1990, in the standard "West versus Rest" narratives that are the stuff of think-tanks, popular histories, and op-ed pieces. It still dominates the writings of K.N. Chaudhuri on the Indian Ocean, or of an ostensibly radical project like that of Gunder Frank. In this lecture, I wish to highlight the importance of a counter-project that uses terms like "carrefour" (crossroads), or connection, which, I believe, avoids many of the pitfalls, both intellectual and political, of the civilizational paradigm. Recent political events in South Asia, as well as in Europe, make this counter-project of a particular salience.

Sanjay Subrahmanyam, Professor and Irving and Jean Stone Endowed Chair in Social Sciences, joined University of California-Los Angeles (UCLA) in 2004. Educated at the University of Delhi, he initially taught at the Delhi School of Economics, where he was named Professor of Economic History (1993-95). Thereafter, Subrahmanyam taught at Paris from 1995 to 2002 as Directeur d'études in the Ecole des Hautes Etudes en Sciences Sociales. In 2002, Subrahmanyam was appointed as the first holder of the newly created Chair in Indian History and Culture at the University of Oxford, a position he held for two years before moving to a chair in UCLA. From July 2005 to June 2011, he served as founding Director of UCLA's Center for India and South Asia. In 2013, Sanjay Subrahmanyam was elected to a Chair in Early Modern Global History at the Collège de France in Paris, and delivered lectures there over the year 2013-14. From July 1, 2014, he has been named to the Irving and Jean Stone Chair in UCLA. His recent publications include *Three Ways to be an Alien* (2011), and *Courtly Encounters* (2012).

Ecological Themes in Traditional Indian and Chinese Medicine

Andrew Brennan

Department of Philosophy, La Trobe University, Australia
a.brennan@latrobe.edu.au

Some environmental philosophers have wondered if, in Holmes Rolston's phrase, the 'east can help the west to value nature' (Rolston 1987). Others, expressing themselves in the idiom of the resource economists have asked whether Hindu and other 'Asian traditions' of thought may be 'defended as a valuable conceptual resource for a positive and direct environmental ethic' (Callicott 1994, p 48). In reply to his own question, J. Baird Callicott claims that the main trends of Hindu thought have been 'ambiguous about the value of nature' (ibid., 53) or perhaps even 'anti-environmental' (ibid., 48), conclusions which the present paper rejects. I argue that there is a plausible case to be made that Hindu medicine, as represented by the tradition of Ayurveda, incorporates an understanding of health and disease which is compatible with Western ecological thought and is capable of an 'ecological' interpretation. It is interesting to question why the contribution of Ayurvedic and other medical traditions to environmental thinking has been apparently overlooked by a large number of scholars.

Andrew Brennan is currently Professor of Philosophy and Pro Vice-Chancellor (graduate research) at La Trobe University Melbourne. From 1992 to 2006, he was Professor and Chair of Philosophy at the University of Western Australia. His recent books include two co-authored works; *Understanding Environmental Philosophy* (Acumen, 2010) and *Logic: Key Concepts* (Continuum, 2005). As well as publications in the history of science, he has also written extensively on environmental ethics, public policy and philosophy of logic. His most recent work has dealt with the concepts of dignity, forgiveness and human presence.

Translating South Asian Medicinal Knowledge for European Consumption: Three Examples from Southwestern India, 16th-18th Centuries

Kapil Raj

École des Hautes Études en Sciences Sociales, France

kapil.raj@ehess.fr

In the wake of a west European presence in the Indian Ocean from the end of the 15th century, one witnesses an increasing interest in materia medica and their uses in Asian medicine and medicinal practices. This is attested to by a number of herbals and pharmacopeia in Latin and/or western European vernaculars. This paper will trace three such works from the southwestern coast of India from the 16th to the 18th centuries to show how they sought to “translate” classifications and medicinal practices from one system to another.

Kapil Raj is Directeur d'études (Research Professor) at the École des Hautes Études en Sciences Sociales, Paris. Attached to the Centre Alexandre Koyré for the history of science and technology, his research questions the commonly-held assumption of the western origins of modern science. Focusing on the role of knowledge circulation, his book, *Relocating Modern Science* (2007), how the encounter and interaction between South Asian and European specialised practices, knowledge and skills led to the emergence of important parts of what are called the modern sciences. Along with Simon Schaffer and two other historians of science, he is also the co-editor of *The Brokered World: Go-Betweens and Global Intelligence, 1770-1820* (2009) and is currently engaged in writing his next book on the urban and knowledge dynamics of Calcutta in the 18th century.

#Hashtag Histories of Science: Remaking Locality, Rethinking the Global

Carla Nappi

Department of History, University of British Columbia, Canada

carla.nappi@ubc.ca

We, the historians of science, used to know what our object was. The history and philosophy of “science”: it’s a short and simple term, but as the historiography of science transforms into a multisited and epistemologically plural space the term refers to an increasingly inchoate and unstable referent. As we attempt a globalizing of our object, in other words, that object disappears. We need to look for it in new places, while simultaneously devising new ways to conceive both what “it” is and what “place” is.

Some have begun to do this by locating global science in forms of movement, tracing knowledge via circulations and translations. Others have located global science in forms of space, looking carefully at moments of encounter as they have been shaped by trading zones and interstitial spaces. Still others have located global science in modes of practice, shifting our attention from knowledge to praxis as embodied by a range of historical actors. This paper will propose another approach to “globalizing” the history of science, suggesting a turn (at least momentarily) from practice to textuality in locating instruments of globality, and the production of the global itself, on the page. Working from a case study in the translation of bodily knowledge across early modern Manjuphone Eurasia, the paper will rethink the notion of historical “context” as it explores the generativity of juxtaposition as historical practice. It will suggest, among other things, that we need collectively to move away from a model of knowledge circulation among localities, and instead reconsider how attention to the historical spatialities of Eurasia and central Asia can help us reframe what a locality is, how it is produced, how it means, and how new formulations of locality emerge when we move away from histories of science rooted in the nation-state or civilization.

Carla Nappi is Associate Professor of History and Canada Research Chair in Early Modern Studies at the University of British Columbia. She works in the history of China, of science and medicine, and of translation and knowledge exchange. Her first book, *The Monkey and the Inkpot: Natural History and its Transformations in Early Modern China* (Harvard University Press, 2009) was a study of belief-making in early modern Chinese natural history through the lens of the *Bencao gangmu* (1596), a compendium of *materia medica*. Her current research focuses on the cultures and practices of translation across early modern Eurasia. Focusing on the Ming and Qing contexts from the 15th – 19th centuries, it attempts to understand what it has looked like throughout early modernity for people to decide that something was equivalent or identical to something else. Nappi also hosts two podcast channels, New Books in East Asian Studies (<http://newbooksineastasianstudies.com/>) and New Books in Science, Technology, and Society (<http://newbooksinscitechsoc.com/>). To learn more about her work, visit www.carlanappi.com.

**Do We Need History of East Asian Science at All If (Yes, a Big If)
We Can Have History of Global Science?
– Or One and a Half Cheers for Asia as Method**

Fa-ti Fan

Department of History, Binghamton University, USA
ffan@binghamton.edu

Historians of science have lately discovered the global. In recent years, books, articles, and conferences devoted to global history of science and technology are appearing at a rapid rate. It is an exciting development, but as is often the case with new intellectual turns, there are as many questions and challenges as opportunities waiting in the paths ahead. The intellectual terrain is still barely recognizable. There aren't yet well-defined topics, themes, problems, and methodologies, though there are certain discernible trends. This paper will examine some of the influential concepts, categories, and methodologies in the existing literature in the global history of science.

Fa-ti Fan is the author of *British Naturalists in Qing China: Science, Empire, and Cultural Encounter* (Harvard UP, 2004) and has published extensively on the topics of science in modern China and science in imperial and global contexts. He is currently writing a book on transnational science in Republican China and another on earthquakes and seismology in communist China. He teaches in the History Department at Binghamton University.

**After Travel and Contact: The Sciences of Race in the Pacific,
South-east Asia and Southern Africa**

Sujit Sivasundaram

Faculty of History, University of Cambridge, UK
sps20@cam.ac.uk

In the late-eighteenth and early-nineteenth centuries, the British Empire swung east and explored new oceans. Even as this occurred scientific theorists of language, migration, ethnology and other broader facets of culture – encompassing everything from clothes to hair – sought to fit the peoples of the Pacific, South-east Asia and Southern Africa into grids and scales in order to denote progress, civilization, cultural status, scriptural patterns and national stock. In the midst of these imperial and global intellectual changes the idea of the ‘native’ was solidified: shifting from the noble and skilled craftsman and guide and remnant of a past glorious civilization to the bearer of an inferior stock, doomed to extinction. This transformation came about even as the idea of the ‘native’ was scientised in relation to new disciplines of orientalism, natural history and natural philosophy. This paper traces this contortion of the idea of the ‘native’ and the consolidation of a science of race in three separate areas where the British were coming to increasing power in the ‘oceans of the East’: the Pacific, South-east Asia and Southern Africa. It argues that power and hierarchy were consistent features of this story, in both renditions of the ‘native’, before and after the science of race took off. Nevertheless, the shifting senses of the ‘native’ offer a salutary lesson on the effects of travelling intellectual work, then and perhaps now too. Why does intellectual contact and exchange so quickly generate detachment, disparagement and imperialism? In methodological terms, it argues that the present emphasis on brokerage and mediation, and ‘travelling’, in histories of science must keep in view how such processes give rise to their opposite.

Sujit Sivasundaram lectures in World and Imperial History at the University of Cambridge and is a Fellow of Gonville and Caius College, Cambridge. His two books are: *Nature and the Godly Empire: Science and Evangelical Mission in the Pacific, 1795-1850* and *Islanded: Britain, Sri Lanka and the Bounds of an Indian Ocean Colony*. He edited a special focus issue on *Global Histories of Science for Isis* (2010). He is currently working on the age of revolutions in the Indian and Pacific Oceans. He will be a Senior Visiting Fellow for three months at the Asia Research Institute from November 2014.

**A Great Data Divergence?
Humboldtian Science in the Context of Global Economic History**

Jessica Ratcliff

Humanities (History), Yale-NUS College, National University of Singapore
jessica.ratcliff@yale-nus.edu.sg

This paper is a preliminary attempt to connect aspects of the historiography of science to that of global economic history. It compares analyses of the rise of “Humboldtian” science with the standard picture of science and technology within the great divergence debate. Both are concerned with developments in Europe during the “very long” eighteenth century, c. 1680—1850. As it turns out, while there has been much written about whether and to what degree science and technology played a role in the great divergence, very little attention has been paid to the important question of how and whether the great divergence impacted scientific practice. One way of pursuing the latter is to focus not on the productions of science—e.g. theories, knowledge—but on what is consumed in scientific practice: e.g., data, specimens, and information of all kinds. I conclude that, through the dynamic reaction of the sciences to that changing material landscape, the great divergence also entailed changes to the consumption patterns of the sciences. Those changes would, in turn, give rise to new forms of scientific production—and hence to new forms of scientific methodology. In the example from this paper, that new methodology is synonymous with those developments slotted under the label of Humboldtian science.

Jessica Ratcliff is Assistant Professor of Humanities (History) at Yale-NUS College. For 2012-14, she is also the Sackler-Caird Research Fellow at the National Maritime Museum London. Her work deals with the history of science and technology in Britain and its former empire from the seventeenth through the nineteenth century. Dr Ratcliff's current project is titled “Archiving the Globe: Maritime Imperialism and Scientific Practice in Nineteenth-Century Britain.” She is also working on the history of science and the state in nineteenth-century Kerala.

**Lateral “Gene” Transfer:
A (Perhaps Unsuccessful) Model of Knowledge Exchange in Globalized Networks**

Gordon McOuat

University of King's College/Dalhousie University, Canada
gmcouat@dal.ca

Having abandoned unilinear centre-periphery “diffusionist” models in favour of pluralist circulations, Science Studies and History of Science are now sensitive to how things and concepts move around globally, and what they may bring along with them, moving deftly in both directions. This paper will investigate a specific model of lateral transfer and networked perspectivalism, developed in the world of genetics, biology and Japanese concepts of imperialism, nationalism and philosophy in the inter-war period, and how that model itself, whilst promising much and intriguing many in the West, in the end failed to circulate. Following that model's life-cycle will, hopefully, shed light on the ways in which we will tell our globalized history of science, especially that of biology and the life sciences. A brief description of Japanese imperial biology and the “dynamic system” of Bunzo Hayata will lead to a discussion of Sundar Sarukkai's question: “How will this knowledge affect the way that we teach history and philosophy of science?”

Gordon McOuat teaches history and philosophy of science at the University of King's College/Dalhousie University and is the National Director of “Situating Science”, the Canadian Strategic Knowledge Cluster for the Humanities and Social Studies of Science, and Director of the new “Cosmopolitanism and the Local” international research project. His research focuses on the relationship between logic, classification systems and styles of thinking, both locally (India, Japan, Europe) and globally.

Knowledge Practices and 'Globalizing History'

Karel Davids

Faculty of Arts and Faculty of Economics, VU University Amsterdam, Netherlands

c.a.davids@vu.nl

How can we 'globalize' the history of science, while taking account of different cultural traditions? To what extent are (or were) cultural traditions 'incommensurable' or not? This paper addresses these questions by looking at practices of knowledge in the past. Knowledge practices are conceived here as practices concerned with knowledge for specific types of activities. The paper examines practices of knowledge in activities such as hydraulic engineering, machine making, navigation and cartography in Asian and European contexts between about 1400 and 1800. It takes both comparative and connective perspectives: it discusses not only similarities or differences in knowledge practices, but it also asks how and to what extent these practices were connected, what knowledge actually travelled from one context to another (or not), how people at the time reflected about this process and which factors or circumstances favoured or hindered exchanges of knowledge between different contexts over time.

Karel Davids, born 1952, studied Economic and Social History at the University of Leiden, the Netherlands, where he received his PhD in 1986. He was Assistant Professor in Social and Political History at the Erasmus University Rotterdam and Research Fellow of the Royal Netherlands Academy of Arts and Science at the University of Leiden. Since 1994 he holds the Chair of Economic and Social History in the Faculty of Arts and the Faculty of Economics of the VU University Amsterdam, the Netherlands. His publications in English include *Religion, technology, and the Great and Little Divergences: China and Europe Compared C.700-1800* (Leiden, Brill 2013), *The rise and decline of Dutch technological leadership. Technology, Economy and Culture in the Dutch Republic, 1350-1800* (Leiden, Brill 2008), *A Miracle Mirrored. The Dutch Republic In European Perspective* (Cambridge UP 1995) (co-edited with Jan Lucassen). His present research interests concern the relations between globalization processes, human capital and the making of knowledge. He is a member of the Steering Committee of the Stevin Centre for History of Science and Humanities at the VU University Amsterdam.

Tribal Scientists: Indigenous Epistemologies and the Philosophy of Science

Alberto Gomes

Centre for Dialogue (Anthropology), La Trobe University, Australia
a.gomes@latrobe.edu.au

From a modernist perspective of science, the title of my paper may be regarded as an oxymoron. How, one might ask, can Tribal (or Indigenous or traditional for that matter) knowledge, commonly viewed pejoratively as 'primitive', irrational, and mythical, be associated with, or deemed to be part of, a scientific realm or philosophy characterised by rationalism, positivism, objectivity, and verifiability. In the modernist perspective, indigenous knowledge (and epistemologies) have been dismissed or discredited as irrelevant and useless elements of the 'traditional' that needed to be discarded into the dustbin of history. The attendant epistemological vacuum was to be filled by 'modern' scientific knowledge and practices, almost exclusively adopted from the West. Several anthropologists, researching within the fields of ethno-ecology and ethnosience (including ethno-botany and ethno-zoology), have documented the complexity and sophistication of traditional and Indigenous knowledge and have suggested its potential value in developing solutions to global problems, especially in relation to the ecological crisis. This paper draws from this large corpus of work and takes a post-colonial and political ecology approach to argue against the exclusivism of modernist science and for an epistemological diversity. I focus on three ethnographic cases—Orang Asli (Malaysian Aborigines) concept of suspension bridges, Australian Aboriginal traditional bush fire technology, and the role of Hanunoo (of the Philippines) ethno-botany, pedology, and edaphology in their horticultural farming practices—to conduct an epistemological dialogue between scientific and Indigenous ways of knowing and to highlight the need to transcend the monoculture of scientific knowledge to an 'ecology of knowledges.' [Santos, B. Sousa (ed.) (2007), *Another Knowledge is Possible: Beyond Northern Epistemologies*. London: Verso].

Alberto Gomes is a Professor of Anthropology and the Director of La Trobe University's Centre for Dialogue. Widely recognised for excellence in teaching, he has also taught in Malaysia, Finland and Spain. He was the Development Studies Program Coordinator at La Trobe for more than 10 years and Convener of the Sociology and Anthropology Program between 2006 and 2009. His anthropological research on the Orang Asli (Malaysian aborigines,) spanning more than 30 years has resulted in numerous articles and three books. He is currently working on the anthropology of civility and on the nexus between equality, sustainability and peace. Among his most recent publications is the book (coedited with Lim Teck Ghee and Azly Rahman) *Multiethnic Malaysia: Perspectives on Past, Present and Future. Petaling Jaya and Kuala Lumpur: Strategic Information and Research Development Centre and USCI University* (2009).

Global Philosophy of Science: Roots, Problems and Prospects

Meng Jianwei

Department of Philosophy, College of Humanities & Social Sciences
University of Chinese Academy of Sciences, China
mengjw@ucas.ac.cn

The globalization of philosophy of science originates from the globalization of science. The globalization of science is the globalization of scientific knowledge and methodology in nature. It is the globalization of scientific knowledge and methodology that establishes the foundation and paradigm of global philosophy of science. This paradigm is a kind of methodology and epistemology, which aims to transform philosophy of science into “the logic of science”. However, science is not only a kind of knowledge and methods, but also a kind of culture, which contains knowledge and methods and has a close relationship with multicultural world. The most serious problems of the global philosophy of science lie in that its study of “the logic of science” cuts off the cultural roots of science and its close relationship with multiculturalism. As a result, although it exhausts almost all the logical possibilities, it fails to propose the promising solutions to the most basic questions in the philosophy of science, including the demarcation between science and non-science, the progress and rationality of science, the controversy between realism and anti-realism and so on. Furthermore, the theoretical production and logical approach of the global philosophy of science can't exert real influence upon scientific practice. Especially, it makes little contribution to the global progress of science. In order to get out of this predicament, global philosophy of science should fulfill a paradigm shifting, which aims to transform philosophy of science into philosophy of scientific culture. Philosophy of scientific culture devotes itself to expand the theoretical horizon of philosophy of science to the whole culture and disclose the cultural nature of science and its profound connection with multicultural world. The research program of philosophy of scientific culture could push forward the studies of methodological and epistemological questions and deepen the understanding of the origins, driving forces, aims, meaning and values of science as well. Global philosophy of science needs the multicultural perspectives, and philosophy of scientific culture would open up the promising prospects for the global philosophy of science.

Meng Jianwei is professor of Philosophy of Science and Director of Philosophy Department at University of Chinese Academy of Sciences. He is the vice-director of the Council of Cultural Studies of Science and Technology at The Chinese Society for Dialectics of Nature. He also serves on the editorial board of *Studies in Philosophy of Science and Technology* and *Journal of Dialectics of Nature*. His research interests focus on philosophy of science, cultural studies of science, philosophy of culture and philosophy of education. He is the author of *A Research on Philosophy of Science and Technology* (1998), *On Humanistic Value of Science* (2000), and of numerous articles on philosophy of science, cultural studies of science, philosophy of culture and philosophy of education, editor with Hao Yuan of *An Inquiry into the Frontiers of Cultural Studies of Science* (2013).

How Does Science Travel?

Axel Gelfert

Department of Philosophy, Faculty of Arts and Social Sciences, National University of Singapore
phigah@nus.edu.sg

It is now a commonplace that science is a collective enterprise, marked by an increasing division of labour and a high degree of interdependence. Though historically contingent in various ways, science – at least in its self-image, if not always successfully (and certainly not in unilinear fashion!) – aims to transcend its historical origins and present an ever more complete scientific image of the world. It is crucial to any such story of scientific objectivity and progress that scientific facts must ‘travel’. (Indeed, the question of ‘How well do facts travel?’ was the topic of a recently concluded research project, based at the LSE and led by Mary S. Morgan amongst other.) An obvious measure of scientific success is how well scientific facts travel through time – which is to say, whether they stand the test of time. Historians and philosophers of science have addressed this question under such labels as ‘theory change’ or ‘paradigm shifts’ (along with attendant worries about the incommensurability of scientific theories and results). The rapid rise of scientific subdisciplines and the increasing degree of specialization also requires that, for scientific facts to become influential, they must travel across disciplinary boundaries (synchronically, as it were). Sociologists of scientific knowledge have recently taken an interest in how, for example, scientific expertise is to be assessed in interdisciplinary settings. Yet a broader perspective on how scientific facts must acknowledge how they travel geographically – through processes of diffusion, export, and colonization. The present papers attempts to provide a social-epistemological framework for thinking about scientific facts as ‘travellers’ of this sort and argues that the very mechanisms by which they travel may be fruitfully thought of as conditions of the success of science (however we may wish to define the latter).

Axel Gelfert is an Associate Professor in the Department of Philosophy, National University of Singapore. His research focuses on social epistemology (including its history) and the history and philosophy of science and technology. He is the author of *A Critical Introduction to Testimony* (London: Bloomsbury 2014).

**Commerce and the Cult of Khizr:
Foregrounding a Sacred Geography of Healing in the Indian Ocean World**

Lauren Minsky

Department of History, New York University, Abu Dhabi

lauren.minsky@nyu.edu

This paper considers the theoretical and methodological promises and challenges of global histories of science, technology, and medicine that are written outside of conventional geopolitical spatial categories, particularly with respect to ongoing efforts to better appreciate the agency of non-elites and non-Europeans during the early modern and modern periods. The paper specifically focuses on the spaces of long-standing commercial production and trade in the wider Indian Ocean world to illuminate the presence of an expansive healing cult dedicated to Khizr, an enigmatic water saint and patron of the Sufis. The paper considers how Khizr's cult suggests possible ways to rethink the global rise of scientific medicine by foregrounding a vast trans-regional network of institutions that promoted empirically-grounded knowledge about the body and the environment, and that aimed to set the ritual conditions necessary for ensuring the health of those engaged in commercial activities of production and exchange.

Lauren Minsky is Assistant Professor of History at New York University Abu Dhabi. She received her PhD in History from the University of Pennsylvania, and has been awarded several grants and fellowships including a Mellow Fellowship in the School of Historical Studies at the Institute for Advanced Studies in Princeton, a Social Science Research Council Book Fellowship, and a Fulbright-Hays fellowship. Her earlier research focused on the intersection of environmental and medical history in the Punjab and Indus Valley, and she is currently finalizing a book manuscript entitled *Cultivating Health: Commercial Agriculture, Material Religion, and Collective Healing in the Punjab from Late Medieval to Modern Times*. Her next project follows one of the agrarian healing cults that she researched for this book – that of Khwaja Khizr or al-Khidr, with a prominent shrine situated on an island in the Indus – into the wider Indian Ocean world of commercial production and exchange to contribute to efforts to rethink the underlying Eurocentric and elite biases of global histories of medicine.

Philosophy of Indian Mathematics

Sundar Sarukkai

Manipal Centre for Philosophy and Humanities, Manipal University, India
sundar.sarukkai@manipal.edu

There are many interesting and unique elements that characterize Indian mathematics. It seems as if there is an absence of various elements that are central to Greek and later modern mathematics: Platonism about mathematical entities, axiomatic methods, ideas of sets, symbolization and manipulation through symbols, mathematizing the world etc. This paper attempts to develop a coherent philosophy of Indian mathematics by analysing questions such as the nature of mathematical knowledge, the means of attaining this knowledge, the notions of applicability and its relation to empirical grounding of mathematics by drawing on the specific nature of Indian mathematics.

Sundar Sarukkai is the author of the following books: *Translating the world: Science and language*, *Philosophy of Symmetry*, *Indian Philosophy and Philosophy of Science*, *What is science?* and *The cracked mirror: An Indian debate on experience and theory (with Gopal Guru)*. He is currently the Director of the Manipal Centre for Philosophy and Humanities, Manipal University, Manipal.

Asian Astronomical Traditions and the Scientific Revolution: Exploring Underground Connections

Arun Bala

Asia Research Institute, National University of Singapore
ariab@nus.edu.sg

The role of Asian astronomical traditions – especially the presumed impacts of the Maragha School of Arabic astronomy, the Kerala School of Indian astronomy and the Chinese Infinite Empty Space astronomy - in shaping the seventeenth century Scientific Revolution in Europe has recently become a controversial issue among historians of science. The Asian traditions were built upon quite different conceptions of the motions of the heavenly bodies – the Maragha tradition considered the center of revolution of heavenly bodies to be the Earth, the Chinese saw them as orbiting the Pole Star, and the Indian tradition embraced a geo-heliocentrism in which the sun orbited the Earth, but the planets revolved around the sun. Although it is generally acknowledged that these traditions anticipated many ideas in mathematics, astronomy and cosmology later associated with innovations of the Scientific Revolution, there remains considerable controversy concerning the extent to which they influenced it. This paper will not attempt to resolve this issue but asks instead why the Scientific Revolution could have profited by engaging the Asian traditions. It argues that there are structural parallels between the Copernican theory and the other three theories that not only explains why the former came to displace all of them, but also why it could have advanced by incorporating theoretical and technical discoveries articulated within the Asian traditions of astronomy. The paper will conclude by exploring the relevance of such connections for globalizing history and philosophy of science.

Arun Bala is Senior Research Fellow with the Asia Research Institute and author of *The Dialogue of Civilizations in the Birth of Modern Science* and edited *Asia, Europe and the Emergence of Modern Science: Knowledge Crossing Boundaries*. He is currently involved in exploring the application of a neo-Lakatosian methodology of scientific research programs to understand how cross-cultural confluences can integrate to produce new scientific knowledge. He is also the Southeast Asian partner in a three year project bringing together scholars in Canada, India and Southeast Asia to explore issues in history and philosophy of science focused on the theme *Cosmopolitanism and the Local in Science and Nature: Forging an East-West Dialogue*.