

Bibliography of Recent Materials about  
Big History, Cosmic Evolution, Mega-History, and Universal History  
For the Network of Global and World History Organizations

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This is a compilation of some of the 21<sup>st</sup> century materials relating to the field of big history, cosmic evolution, mega-history and universal history. While many entries imply a general overview, they also include case studies that illustrate the utility of big history techniques in more traditional studies. A number of these entries illustrate how what is now called ‘big history’ by some scholars in the West was actually a global conjuncture, independently developed at almost the same time in different societies around the world.

Walter Alvarez, *The Mountains of Saint Francis*, W.W. Norton, 2009, ISBN 978-0393061857. The author is a geologist and big historian who describes his lifetime of research in Italy. His narrative also provides the background of his research about the asteroid impact that ended the dinosaurs’ sovereignty of Earth 65 million years ago.

Walter Alvarez / Roland Saekow, *ChronoZoom*, University of California, Berkeley, in association with Microsoft Research, 2014, URL: ([chronozoom.com](http://chronozoom.com)). This is a free, online tool for creating interactive timelines and illustrating historical events, from the big bang to the present day. ChronoZoom was conceived and pioneered by a geologist and by a designer seeking to improve big history education. Featuring a zoom factor of five trillion, it helps students and instructors better understand the vast timescales of the cosmos, Earth, prehistory and humanity. It also works to represent traditional timescales.

David Baker, *The Roman Dominate from the Perspective of Demographic-Structural Theory*, in: *Cliodynamics 2*, 2012, pp. 217–251. This work examines the ‘fall’ of the Roman Empire, from the perspective of cliodynamics, with a focus on population cycles and elite dynamics in the final phase of the Roman polity. A big history perspective was used to revisit long-standing questions of what caused the decline of Rome.

—, *Crashcourse, Big History*, at: YouTube, 2015, URL: ([youtube.com/playlist?list=PL8dPuuaLjXtMczXZUmjb3mZSU1Roxnrey](https://youtube.com/playlist?list=PL8dPuuaLjXtMczXZUmjb3mZSU1Roxnrey)). This is a series of ten online episodes that provides an overview of the main phases and core concepts of big history. Originated and written by big historian David Baker, it is presented by John and Hank Green, and funded by Bill Gates Catalyst 3. It is one of the core materials of the Big History Project.

—, *Collective Learning: A Potential Unifying Theme of Human History*, in: *Journal of World History*, 26 [Forthcoming 2015]. This paper looks at collective learning as a concept, its evolution within hominine species, and its role in human history. The author explains the connection of collective learning to Jared Diamond’s ‘Tasmanian Effect.’ Collective learning also played a key role in the two ‘great divergences’ of the past two millennia – the agricultural and industrial revolutions. The paper discusses how collective learning forges connections

between history, cosmology, geology and biology, through a unifying theme of big history – the rise of complexity.

Craig Benjamin, Introduction to the World History Connected Forum on Big History, in: *World History Connected*, 6, 3 (2009). This essay is an introduction to a collection of articles by leading practitioners of big history. It introduces the genre of big history by locating it within the broader historiographical tradition of universal history; outlines some of the new perspectives or insights big history brings to world history; and introduces to readers the collection of big history articles assembled for this forum.

—, The Convergence of Logic, Faith and Values in the Modern Creation Myth, in: Cheryl Genet / Brian Swimme / Russell Genet / Louise Palmer, eds., *Evolutionary Epic: Science’s Story and Humanity’s Response*, Collins Foundation, 2009, 147–153. This essay argues that big history is a powerful tool to engage and challenge students at the highest level of their consciousness, because, at every level, it raises profound questions about origins, what it means to be human, and the reason and purpose for existence.

—, Big History, Collective Learning, and the Silk Roads, in: Leonid Grinin / David Baker / Esther Quaedackers / Andrey Korotayev, eds., *Teaching and Researching Big History: Exploring a New Scholarly Field*, Uchitel, 2014, 265–276. The silk roads are a quintessential example of the interconnectedness of societies during the era of agrarian civilization. This essay argues that the comingling of goods, ideas and diseases around a geographical hub deep in Eurasia was the catalyst for an extraordinary increase in the complexity of human relationships and collective learning, a complexity that helped drive our species towards the revolution of modernity.

—, The Little Big History of Jericho, in: Barry Rodrigue / Leonid Grinin / Andrey Korotayev, eds., *From Big Bang to Galactic Civilizations: A Big History Anthology, Volume 1, Our Place in the Universe: An Introduction to Big History*, Primus Books, 2015, 247–262. This essay uses Jericho as a case study to explore the critical relationship between history and its environmental context. Jericho is the oldest known city on the planet; its location and 14,000-year survival provide an excellent example of how big history can offer new perspectives on human history.

Craig Benjamin / Esther Quaedackers / David Baker, eds., *The Routledge Handbook of Big History*, Routledge [Forthcoming 2018]. This volume features essays from 25 of the world’s leading big historians. The essays are organized into five thematic sections, each composed of five chapters. The sections are on the topics of big history and science; big history, social science and the humanities; little big histories; teaching big history; and big history and the future.

Big History Project ([bighistoryproject.com](http://bighistoryproject.com)). The Big History Project is a free and comprehensive curriculum for secondary level students around the globe. The website is home to a number of big history resources, including a self-guided, six-hour version of the course for life-long learners. This mini-course for adults is presented in five chapters: (1) The Universe, (2) Our Solar System and the Earth, (3) Life, (4) Humans, and (5) Today and Beyond. There is a sign-up page for educators who would like access to the comprehensive course for secondary students. It provides instructors with all they need to teach big history, including 10 units with over 150

hours of resources, videos and primary sources for students, lesson plans, and connection to the BHP's large network of teachers.

Rich Blundell, Making it Real: Developing Cosmosis1, the Cosmic Background Radiation Explorer App, in: International Journal of Immersive Education, July 2013. The Cosmic Background Explorer App is available on iTunes at ([itunes.apple.com/us/app/cosmosis1-cosmic-microwave/id896359769?ls=1&mt=8](https://itunes.apple.com/us/app/cosmosis1-cosmic-microwave/id896359769?ls=1&mt=8)). This is the first in a series of the developer's smartphone apps that enhance education in and communication of big history ideas. This app teaches users what the cosmic background radiation is, how we know what it is, and where it is. It provides a real-time, geospatial, and phenomenological experience.

—, Shakespeare in the Cave: A Big History of Art is the first in a series of the author's public lectures. It was initially presented at the second conference of the International Big History Association, in August 2014, in San Rafael, California, and is available for viewing on YouTube at ([www.youtube.com/watch?v=VoisuLgCDr0](http://www.youtube.com/watch?v=VoisuLgCDr0)). It is a creative-practice project, emanating out of the author's Ph.D. dissertation, and concerns the transformative learning that can happen through engaging with the big history narrative.

Cynthia Stokes Brown, Big History: From the Big Bang to the Present, New Press, 2012, ISBN 9781595588487. This book contextualizes human history within the scope of universe history. Because the science is explained simply, this volume is accessible for undergraduates without strong science backgrounds. Two of the thirteen chapters pertain to science; they can easily be added to a global/world history course to provide the whole framework. Using the whole book enables students to understand the current challenges of limited resources and climate change.

—, Constructing a Survey Big History Course, in: Leonid Grinin / David Baker / Esther Quaedackers / Andrey Korotayev, eds., Teaching and Researching Big History: Exploring a New Scholarly Field, Uchitel, 2014, 328–335. This article explores decisions facing an instructor who wants to begin teaching big history. It suggests multiple possible solutions about how to proceed, either as an individual instructor or as a team of instructors.

Canadian National Film Board, Hubert Reeves, Star Teller, Iolande Cadrin-Rossignol (director), 2002. Hubert Reeves is an astrophysicist whose honours from the scientific community include the Albert Einstein award. He is also known for his exceptional talent to integrate science and humanism. He studied with some of the great scientific minds of the 20<sup>th</sup> century, such as Hans Bethe, Philip Morrison and Bob Wilson. Professor Reeves explains history and theory in a highly accessible way. A committed ecologist, he warns about the deterioration of our planet. In the face of explosive economic globalization, he believes that globalization of ecological movements offers hope.

Eric Chaisson, Epic of Evolution: Seven Ages of the Cosmos, Columbia University, 2006, ISBN 978-0231135603. Researchers around the globe have acquired vast amounts of observational data and gained much theoretical insight into many aspects of cosmic evolution. The story of cosmic evolution has been strengthened by advances in non-equilibrium thermodynamics, a

frontier subject that models the flow of energy through open, complex structures – whether those structures are galaxies, stars, planets, or life.

—, Practical Applications of Cosmology to Human Society, in: *Natural Science*, 6, 10 (2014), pp. 767–796. Complex systems display structures and functions built and maintained by optimal energies flowing through them. Cosmic evolution is rich in empirical findings about systems that can help assess global problems. Despite its grand and ambitious objective to unify theoretical understanding of all known complex systems, cosmic evolution’s emphasis on quantitative data analyses informs us about the serious issues challenging 21st-century society, including global warming, world economics, and cancer. This paper suggests how energy-flow modelling can guide our search for viable solutions to real-world predicaments.

—, *Cosmic Evolution: From Big Bang to Humankind*, Harvard University, 2015, URL: ([https://www.cfa.harvard.edu/~ejchaisson/cosmic\\_evolution/docs/splash.html](https://www.cfa.harvard.edu/~ejchaisson/cosmic_evolution/docs/splash.html)). This multi-media website derives from Professor Chaisson’s *Universe: An Evolutionary Approach to Astronomy* (1988), *Cosmic Evolution: The Rise of Complexity in Nature* (2001), and *Epic of Evolution: Seven Ages of the Cosmos* (2006). It comprises the essence of his undergraduate course on cosmic evolution, taught for the past 35 years, mostly at Harvard University. The introductory track is for non-scientists who may select any epoch along the arrow of time, as well as figures, tables and key terms for expanded viewing. The advanced track is for specialists, including PDF files for each epoch, which are updated every few months.

Ji-Hyung Cho [조지형] / Seohyung Kim [김서형] / Myunghyun Lee [이명현] / Daeik Jang [장대익 감수], 빅히스토리 시리즈 [Big History Series], 서울: 와이스쿨 [Y-School, Big History Series], 2012 (Korean publication). This is a twenty-volume series of school books on the subject of big history that were written for Korean teenagers. It was part of the Korean National Research Foundation program for the World Class University, a national effort to invigorate education and stimulate new directions for research and pedagogy. Among its projects, it launched efforts to establish big history in Korea, at all levels of education. This series was one of the products of this work. It is intended to serve as a series of readers in big history, so as to educate students about the field of study and to change their attitudes about our global society.

Ji-Hyung Cho [조지형] / David Christian / Bob Bain, 빅히스토리 [*Big History*], 해나무 [Haenam], 2013, ISBN 978-8956056937 (Korean publication). This collection on big history includes Professor Cho’s overview, along with translation of materials from the Big History Project, as well as Korean and other examples. It is used in high school and university education.

David Christian, *Maps of Time: An Introduction to “Big History,”* University of California, 2004, ISBN 0-520-23500-2. This book demonstrates that big history can be told with rigour and precision. It provides valuable insights derived from synergies between many different disciplines. It argues that the broad context of big history offers new ways of approaching many of the core questions of world history, including the question of when human history itself really started and when social complexity arose.

—, *Big History: The Big Bang, Life on Earth, and the Rise of Humanity*, The Teaching Company, 2008, ISBN 978-1598034097. This electronic production consists of 48 half-hour lectures. These lectures have introduced a detailed version of the big history narrative to many outside the academic community. Hearing these lectures prompted Bill Gates to propose launching the Big History Project in order to make big history available in high schools.

—, Christian, David, William McNeill. *An Introduction to 'Big History'*, 2008. URL: (<http://www.youtube.com/watch?v=IBCvpIK7g8U>). This was a dialogue between historian emeritus William McNeill and big historian David Christian about how their views of global and world history converge.

—, The Return of Universal History, in: *History and Theory*, 49, 4 (2010), pp. 5–26. This article placed big history within the framework of historical scholarship. It argues that something analogous to big history has been present in most human communities, wherever people constructed and passed on 'origin stories.' In some form, 'universal histories' have also been common within written historiographical traditions in many parts of the world. These traditions vanished in the late 19<sup>th</sup> century, as modern scholarship, in field after field, committed to specialization. The appearance of big history in the late twentieth century counts therefore as a revival, on the basis of modern scientific scholarship in many different fields, of an ancient approach to understanding the past.

—, *World Environmental History*, in: Jerry Bentley, ed., *The Oxford Handbook of World History*, Oxford University, 2011, 125–142. Big history raises many questions about the human relationship to the biosphere and environment. Indeed, there is a natural affinity between big history and environmental history. Because big history explores the past at such large scales, it makes us peculiarly aware of the vast increase in the scale of human interactions with the biosphere in recent centuries, in the epoch known as the 'Anthropocene.' This article focuses on environmental history at global scales, and on the relationship between environmental history, world history and big history.

—, *The History of our World in 18 Minutes*, presentation for the TED (Technology, Education, Design) conference series, 2 March 2011, URL: ([youtube.com/watch?v=yqc9zX04DXs](http://youtube.com/watch?v=yqc9zX04DXs)). This was a landmark presentation by David Christian on big history. It served as a launching event for the Big History Project (see above), which Christian developed with Bill Gates.

David Christian / Cynthia Brown / Craig Benjamin, *Big History: Between Nothing and Everything*, McGraw-Hill, 2013, ISBN 978-0-07-338561-7. This is the first college-level text on big history, written by three big historians with long experience in teaching the subject. It updates the big history narrative, incorporates the core idea of thresholds of increasing complexity, and provides further readings and resources, along with chapter questions and many illustrations, maps and diagrams. Nine of the thirteen chapters concern global human history, which help it dovetail into existing narratives of world history.

Dwight Collins / Russell Genet / David Christian, *Crafting a New Narrative to Support Sustainability*, in: *State of the World, 2013: Is Sustainability Still Possible?* 2013, 218–224, ISBN 978-1-61091-449-9. State of the World has published updates on human relationships to the biosphere since the 1990s. This article proposes that re-thinking our relationship to the global

environment in order to build sustainable societies will require, among other things, re-thinking our understanding of human history and the relationship of humans to the planet. That new chronicle already exists within big history, so the article proposes that big history provides the narrative that will be needed if we are to build a more sustainable world.

Deep Time Journey Network ([www.deeptimejourney.org](http://www.deeptimejourney.org)). This is an online, global community of educators, scientists, clergy, artists and others exploring an evolving universe in a foundational context. Begun by Jennifer Morgan, its members represent different “lineages”: Montessori cosmic education, big history, new cosmology, and others. Participants add profiles, resources and events, and participate in forum discussions and groups. Philosophical overlap and differences between lineages are explored on the forum. Online professional development programs for teachers of children (ages 0 to 18) begin in autumn 2015.

Huichuan Duan [段会川], ChronoZoom: New Thinking in Time-Lined Knowledge for History and Historical Sciences, Origins, International Big History Association, 3, 11 (2013), pp. 14–18. This paper describes the work by a computer scientist to adapt the online, big history platform, ChronoZoom, for use in China (see Alvarez/Saekow, above).

Evolution is an English-language, Russian-based almanac produced by Uchitel Publishing House in Volgograd. It has a focus on big history and global history. Three of their almanacs have been published so far – *Evolution: Cosmic, Biological, Social* (2011); *Evolution: A Big History Perspective* (2011); *Evolution: Development within Big History, Evolutionary and World-System Paradigms* (2013). The series is managed by the macro-historians Leonid Grinin and Andrey Korotayev, who also work with the Eurasian Center for Megahistory and System Forecasting (Moscow).

Tom Gehrels, *Survival through Evolution, from Multiverse to Modern Society*, BookSurge, 2007, ISBN 978-1419670558. Astronomer Tom Gehrels merges a lifetime of scientific research with a lifetime of social experience to produce this very readable synthesis of existence. His narrative spans his days as a resistance fighter against the Nazis through those as a graduate student of astrophysics in Chicago. Professor Gehrels participated in the discovery of over 4000 asteroids, as well as a number of comets. In 1980, he founded the Spacewatch Project, which uses telescopes on Kitt Peak (Arizona) to survey the sky for threats to Earth.

—, The Chandra Multiverse, in: Barry Rodrigue / Leonid Grinin / Andrey Korotayev, eds, *From Big Bang to Galactic Civilizations: A Big History Anthology, Volume III, The Ways that Big History Works: Cosmos, Life, Society, and our Future*, Primus Books [Forthcoming 2016]. This paper focuses on the redeployment of an equation developed by astrophysicist Subrahmanyan Chandrasekhar – the cosmic-mass equation. As a result of this work, Professor Gehrels deduces the existence our universe within a larger multiverse, which he names the “Chandra Multiverse.”

Leonid Grinin / David Baker / Esther Quaedackers / Andrey Korotayev, eds., *Teaching and Researching Big History: Exploring a new scholarly field*, Uchitel, 2014, ISBN 978-5-7057-4027-7. This is a selection of papers from the first International Big History Association conference, in Grand Rapids, Michigan, in August 2012. The topics cover the range of big history, from in-depth research to pedagogy.

Leonid Grinin / Andrey Korotayev / Robert Carneiro / Fred Spier, Evolutionary Megaparadigm: Potential, Problems, Perspectives, in: Barry Rodrigue / Leonid Grinin / Andrey Korotayev, eds, From Big Bang to Galactic Civilizations: A Big History Anthology, Volume 1, Our Place in the Universe: An Introduction to Big History, Primus Books, 2015, 83–97. Evolutionary studies are an area in which natural and social sciences and the humanities find common ground. However, a higher level of co-operation so as to better achieve such integration is needed, which implies the need for a common field within which we can clarify evolutionary approaches, terminology and principles. The authors propose that this new interdisciplinary field already exists; it is big history.

Lowell Gustafson, Big History, Part I, in: International Schools Journal, 33, 2 (2014), pp. 35–46; Big History, Part II, International Schools Journal, 34, 1 (2014), pp. 50–60. With advances in the natural sciences, analysis of physical evidence has transformed previous understandings of the past. History can no longer be restricted to the written record. Historical periods can no longer be organized just by political, economic, social or cultural criteria or over the past few centuries and millennia. These two articles present the field of big history in the context of traditional history.

—, Big Politics, in: Barry Rodrigue / Leonid Grinin / Andrey Korotayev, eds, From Big Bang to Galactic Civilizations: A Big History Anthology, Volume 1, Our Place in the Universe: An Introduction to Big History, Primus Books, 2015, 275–267. This essay extends the origins and development of politics to before traditional starting points (in the ancient period, 2500 years ago). This re-evaluation permits us to reframe a variety of pressing current political issues, such as globalization, race relations, and gender politics.

David Hookes, The Evolution of Information Systems: From the Big Bang to the Era of Globalization, in: Barry Rodrigue / Leonid Grinin / Andrey Korotayev, eds, From Big Bang to Galactic Civilizations: A Big History Anthology, Volume 1, Our Place in the Universe: An Introduction to Big History, Primus Books, 2015, 288–304. The development of the universe can be seen as a series of stages, with each stage associated with a new information system. The present form of globalization is made possible, in part, by the development of modern information and communications technology. Information workers are the dominant profession in advanced economies, and one of their sub-groups, knowledge workers, can play an especially important role in resolving the crises of the socio-economic and physical environment.

Nigel Hughes, Monisha and the Stone Forest, [Monishar Pathorer Bon], Geological Society of India, 2012, ISBN 978-81-9076367-7. This book was written by a palaeobiologist and big historian who works in the Himalayas. Professor Hughes introduces basic principles of historical geology as revealed to a bright and curious village girl in her quest to find a natural explanation for “gatchpathor” (petrified wood) that is common throughout much of Bengal. This effort in science education introduces scientific thinking about earth history to children. It was part of the Geological Society of India’s outreach program to children in regional languages, being published in Bengali and English.

International Big History Association (<http://www.ibhanet.org/>). The IBHA was founded in 2010 at a meeting of big historians in the Apennine Mountains of Italy, at the Coldigioco Geological

Observatory. Its website hosts references and information pertaining to big history around the world. Its newsletter, *Origins*, provides news of developments in the field, as do the IBHA's biennial conferences. This website provides contacts for the association's officers and others, for anyone interested in further information about big history.

Seohyung Kim [김서형], Big History Education and the Convergence Education Program for Talented Students [거대사 교육과 융합영재 교육프로그램], 이화사학연구 [Ewha History Bulletin], 44, 1 (June 2012), pp. 257–281 (Korean publication). This article describes the development of convergence education and big history in Korea, and why they are important in today's world. Adopted by Korean educators, convergence education connects the natural and social sciences and the humanities, in order to develop new kinds of insights and creativity. This integration expands traditional frames of historical analysis to larger contexts, uses story-telling and narrative as one of its styles, and suggests that big history can be a powerful tool.

—, 韩国的大历史教育 [Big History Education in Korea], in: 全球史评论 [Global History Review], 6 (December 2013), pp. 274–289 (Chinese publication). This article was written in order to assist the expansion big history education in China by providing information about how the field developed in Korea.

Seohyung Kim [김서형] / Yong Woo Kim [김용우], 거대사: 세계사의 새로운 대안 [Big History: New Alternative to World History], Seohaemunjip, 2009 (Korean publication). This was the first big history book in Korea. It provides a guideline of how to understand human historical relationships with their surroundings, as well as providing an understanding of the natural world before human development.

G. Siegfried Kutter, Big History: A Personal Perspective, in: Barry Rodrigue / Leonid Grinin / Andrey Korotayev, eds., From Big Bang to Galactic Civilizations: A Big History Anthology, Volume 1, Our Place in the Universe: An Introduction to Big History, Primus Books, 2015, 24–41. Astrophysicist G. Siegfried Kutter summarizes our scientific understanding of the history of the universe, starting with its beginning in the big bang to the formation of the Sun and its planets, the origin of life on Earth, and life's evolution towards the enormous diversity that we witness today. He concludes with the global challenges that we face and gives a brief answer to the question: “Where do we go from here?” This includes a discussion of his ground-breaking book of big history, *The Universe and Life: Origins and Evolution* (1987).

Xincheng Liu [刘新成] / Sun Yue [孙岳], eds., [Global History Review], 6, 《全球史评论》 [Theme Issue: Big History and Global History], China Social Sciences Press, 2013 (Chinese publication). This is the first comprehensive journal publication devoted to global and big history in China; comprehensive, in that it encompasses three important sections of big history – theory, teaching, and “little big history.” It includes both international and Chinese scholars' reflections on some of the key issues of big history.



Yaohui Liu [刘耀辉], 大历史与历史研究 [Big History and Historical Research], in: 史学理论研究 [Historiographical Quarterly], 4 (2011), pp. 38–50 (Chinese publication). This provides an introduction to big history, relating the field to historical research in China. It affirms the value of big history by pointing out its interdisciplinary nature, which serves as a useful complement to traditional world history curricula.

Xin Ma [马新] / Tao Qi [齐涛], 中国远古社会史论 [A Treatise on Far Ancient Chinese Social History], Science Press, 2003 (Chinese publication). This book employs cross-disciplinary research to address themes from ancient Chinese history, such as floods and other natural events. Many of these accounts have been presented as myths by traditional historians. The authors use archaeological and other scientific approaches and techniques to assess the facts of these ancient traditions. It employs novel interdisciplinary techniques, parallel to big history.

Alexander Markov / Andrey Korotayev, Phanerozoic Marine Biodiversity Follows a Hyperbolic Trend, in: *Palaeoworld* 16, 4 (2007), pp. 311–318. Changes in biodiversity during the present Phanerozoic eon correlate better to hyperbolic models (used in demography and macrosociology) than to logistical models (used in population biology and applied to fossil biodiversity). The authors' findings suggest that similar macro-patterns exist within biological and social phases of big history and that these can be described with mathematical models.

William McNeill, William H. McNeill on 'Big History', 2010.  
URL: ([youtube.com/watch?v=VXkR6AyQRqM&feature=channel](https://www.youtube.com/watch?v=VXkR6AyQRqM&feature=channel)).

John Mears, Implications of the Evolutionary Epic for the Study of Human History, in: Cheryl Genet / Brian Swimme / Russell Genet / Louise Palmer, eds., *The Evolutionary Epic: Sciences Story and Humanity's Response*, Collins Foundation, 2009, 135–144. Historian John Mears describes how he found himself, as a young professor, reacting against academia's increasing fragmentation. He expressed his frustration with a defence of general education, resulting in a 1985 article entitled "Evolutionary Process: An Organizing Principle for General Education," in which he stressed the need to establish connections between disciplines. It amounted to a call to establish a new core curriculum based on big history. His paper describes this process.

Metanexus Institute ([www.metanexus.ent](http://www.metanexus.ent)). Founded in 1998, Metanexus promotes scientifically rigorous and philosophically open-ended explorations of foundational questions. Its website features over 10,000 essays under the rubric "Big History, Big Questions, Big Problems." Metanexus has hosted a dozen international conferences and worked with over 400 universities in 45 countries.

Alexander Mirkovic, The Real End of History, in: Barry Rodrigue / Leonid Grinin / Andrey Korotayev, eds., *From Big Bang to Galactic Civilizations: A Big History Anthology, Volume 1, Our Place in the Universe: An Introduction to Big History*, Primus Books, 2015, 188–208. At the end of the Cold War, political scientist Francis Fukuyama declared an end to grand narratives, as well as the triumph of democracy and liberal capitalism. However, historian Alexander Mirkovic argues that the world saw, instead, a resurgence of religious fundamentalism, along with an attack on science and opposition to paradigms like big history. Professor Mirkovic argues for big

history as a branch of the history of science, and proposes that big historians should seriously analyse possible futures, as the future is also a major part of the “map of time.”

Alexander Moddejonge, *The Biggest Story Ever Told: On the Historiographic Origins of Big History*, California State University at San Marcos, Thesis, M.A. in History, 2012. This thesis provides a graduate student’s assessment of the various strands of history that went into the development of big history.

Jennifer Morgan (writer) / Dana Lynn Andersen (illustrator), *Born with a Bang, The Universe Tells our Cosmic Story*, Dawn Publications, 2002, ISBN 1-58469-033-X. The first volume in a children’s trilogy, this illustrated story provides an illustrated history of the universe, covering the big bang through the formation of our solar system. The second volume, *From Lava to Life* (2003), recounts the emergence of life to the extinction of dinosaurs, while the third volume, *Mammals Who Morph* (2006), covers mammal and human evolution. It includes science concepts along with a glossary and references. These books were developed in collaboration with scientists and scholars.

Osamu Nakanishi [中西治] / Kaoru Sakurai [桜井薫] / Nobuo Tsujimura [辻村伸雄] / Hirofumi Katayama [片山博文], *ビッグ・ヒストリーと 21 世紀の国際秩序 [Big History and the 21<sup>st</sup> Century’s International Order]*, Institute for Global and Cosmic Peace, 2014, ISBN 978-4907614010 (Japanese publication). This is a four-part collection of integrated essays relating to big history. Osamu Nakanishi defines big history as a scientific version of universal history, outlines its 13.8 billion year history, and draws lessons for peace from it. Kaoru Sakurai describes a visit to Moscow, in 2013, by members of the Institute for Global and Cosmic Peace, where they met with Akop Nazaretyan, director of the Eurasian Center for Big History and Systems Forecasting. Nobuo Tsujimura argues that mind is part of nature and cautions about the hubris of human belief in their dominance. He also considers mega-history by reviewing Professor Nazaretyan’s work. Hirofumi Katayama seeks another cosmological perspective on humanity, one with which to overcome the modern risks threatening global peace, by comparing two risk theories.

Akop Nazaretyan, *Evolution of Non-Violence: Studies in Big History, Self-Organization and Historical Psychology*, Lambert, 2010, ISBN 978-3843364690. This book is a collection of the author’s English-language papers, from 2005 to 2010, focusing on the development of life, culture and mind, as stages in the evolution of the universe. Universal megatrends and mechanisms of evolution are explored in the context of an advanced self-organization model, one engaging synergetics and complexity theory. The book’s introduction, “On the Paradox of Human Existence,” also examines some controversies of modern scientific worldview.

—, *Mega-evolution and Big History*, in: Barry Rodrigue / Leonid Grinin / Andrey Korotayev, eds, *From Big Bang to Galactic Civilizations: A Big History Anthology, Volume 1, Our Place in the Universe: An Introduction to Big History*, Primus Books, 2015, 125–143. Big history was construed in the 1980s and 1990s, simultaneously, in different countries, after relevant premises had matured in the sciences and humanities. Various versions and traditions of big history are considered in this article. Most Western authors emphasize the idea of equilibrium and thus reduce cosmic, biological and social evolution to mass-energy processes. In the Russian

tradition, *sustainable non-equilibrium* patterns are preferred. This non-equilibrium approach, in the context of modern control and self-organization theories, alters the portrayal of the past and the estimation of civilization's potentials.

Frank Niele, *Energy: Engine of Evolution*, Elsevier, 2005, ISBN 978-0444518866. This book describes how energy has been an integral driver of evolution. Dr. Niele, an exploratory scientist at Shell Laboratories in Amsterdam, has developed an innovative energy timescale that parallels the more familiar geological timescale. He discusses the effects this information might have on human society and how we should begin organization for this future, from an energy standpoint.

Alexander Panov, Сингулярная точка истории [The Singular Point of History], in: *Общественные науки и современность* [*Social Sciences Today*] 1 (2005), pp. 122–137 (Russian publication). A leading Russian astronomer considers the implications of his scaling law of evolution, which analyses major evolutionary thresholds. (The Snooks-Panov Vertical is so named, because a version of this law was independently discovered by Graeme Snooks, a systems theorist in Australia). The decrease in time between thresholds leads to the postulation of a singularity point in the mid-21<sup>st</sup> century. Professor Panov considers its significance.

Tao Qi [齐涛], ed., *世界史纲* [An Outline of World History], Taishan Press, 2012 (Chinese publication). This collection represents the apex of Professor Qi's cross-disciplinary historical research. It takes the world as its province and extends back in time to its start. This book was reviewed by Professor Sun Yue in the *Guangming Daily* (29 July 2012) as a form of big history.

Esther Quaedackers, A Little Big History of Tiananmen, in: Barry Rodrigue / Leonid Grinin / Andrey Korotayev, eds., *From Big Bang to Galactic Civilizations: A Big History Anthology, Volume 1, Our Place in the Universe: An Introduction to Big History*, Primus Books, 2015, 263–274. This article explores human building and animal building. Special attention is paid to the circumstances that encourage building in the animal world as well as among human builders. This paper uses Tiananmen in Beijing as a case study.

Hubert Reeves, *L'avenir de la vie sur Terre* [Hope for Life on Earth], Bayard, 2012, ISBN 978-2-2274-8525-9 (French publication). The ecological perils on Earth are real, from global warming to the loss of biodiversity. Scientist Hubert Reeves evaluates the situation and proposes actions based on our cosmic origins, developments on Earth, and recent scientific discoveries.

—, *The Universe Explained to my Grandchildren*, Salamambo, 2012, ISBN 978-0956808226. When astrophysicist Hubert Reeves goes for walks with his granddaughter, he is assaulted by her questions: 'How big is the universe? How far are the stars? Are there other universes like ours?' This book is a clear and fulfilling explanation of our place in the universe.

Barry Rodrigue [罗柏安], Big History, Civilization and Human Survival, in: *Thought and Action* 26 (Fall 2010), pp. 139–146. This is a report of Professor Rodrigue's experiences in establishing a big history course at the University of Southern Maine (USA). This was the first big history course included in a general education curriculum anywhere in the world. It then was developed into an online course and attracted students from as far away as Europe and Asia. Students

reported it as having a profound effect on their lives and their careers. This paper is an abridged version of one in the *Journal of Globalization Studies* (November 2010), having been adapted as a study of pedagogy and big history for the National Education Association.

—, Manifesto for a New Millennium, at: Global Future 2045 International Congress, 17–20 February 2012, Moscow, Russia, online at the congress website, (<http://gf2045.com/video/>). This is a presentation about some outcomes that might result from applying a big history paradigm towards the formulation an agenda for global renewal. A typescript version of this presentation also appears on the Global Future 2045 website.

—, Retrofitting the Future, in: Leonid Grinin / David Baker / Esther Quaedackers / Andrey Korotayev, eds., *Teaching and Researching Big History: Exploring a New Scholarly Field*, Uchitel, 2014, 276–282. The author reminds readers that the development that resulted in microscopes and central heating came from human efforts that span tens of thousands of years. We should not dismiss past efforts as mere antique curiosities. Many old techniques are useful as new conundrums arise. The author provides examples of traditional environmental knowledge, industrial applications and materials science for how past experience can be adapted to help humanity adjust to a changing world. This paper is an example of “applied big history.”

—, A New Design for Living, in: Barry Rodrigue / Leonid Grinin / Andrey Korotayev, eds., *From Big Bang to Galactic Civilizations: A Big History Anthology, Volume 1, Our Place in the Universe: An Introduction to Big History*, Primus Books, 2015, 183–187. This paper proposes that collaborative human effort is as important as technological design. Professor Rodrigue proposes that, while we seek faster supercomputers and better global communications, we need to also better care for, educate and engage humans around our planet. By comparing human and IT potential, he proposes that this could well be a way of rescuing humanity in the face of major global problems.

Barry Rodrigue / G. Siegfried Kutter, *Big History: The Study of All Existence*, at: Big History Center, 2015, URL: ([www.bighistorycenter.org](http://www.bighistorycenter.org)). The authors provide an overview of the history of big history. They trace its rudiments in ancient society through the scientific revolution to today. The field has been variously called cosmic evolution, universal history, mega-history, and big history. This on-going essay is updated as new data is assembled from around the world.

Barry Rodrigue / Leonid Grinin / Andrey Korotayev, eds., *From Big Bang to Galactic Civilizations: A Big History Anthology*, Primus Books, 2015, ISBN 978-93-84082-76-5. This is the first comprehensive international anthology of big history. It contains ideas from a hundred contemporary thinkers from around the world. The collection is divided into three volumes: Volume I, *Our Place in the Universe: An Introduction to Big History*; Volume II, *Education and Understanding: Big History around the World*; Volume III, *The Ways that Big History Works: Cosmos, Life, Society, and our Future*. Each volume is self-contained and independent.

Richard Simon / Mojgan Behmand / Thomas Burke, eds., *Teaching Big History*, University of California, 2014, ISBN 9780520283558. This is a pedagogical collection that serves as a guide for teaching big history. It shares ideas about the subject and how to plan a curriculum around it, as well as advice on administrative and organizational challenges to generating a core curriculum

around big history. The book also includes a variety of teaching materials, examples, and sample exercises.

Graeme Snooks, *The Cosmos and the Logos*, in: Barry Rodrigue / Leonid Grinin / Andrey Korotayev, eds., *From Big Bang to Galactic Civilizations: A Big History Anthology, Volume 1, Our Place in the Universe: An Introduction to Big History*, Primus Books, 2015, pp. 98–124. Life has embarked on an improbable voyage through space and time, one that has an observable beginning and a predictable end. It is improbable because the universe through which we are travelling is hostile to complexity of any kind and because the window of opportunity for the emergence of complexity is of relatively short duration. Indeed, the opportunities for the emergence of intelligent life are the most improbable occurrence of all. Using his general dynamic theory, Professor Snooks explores how and why this voyage was embarked upon and the importance of its meaning.

—, *Ark of the Sun: The Improbable Voyage of Life*, IGDS Books [Forthcoming 2015]. This book is an overview of system theorist Graeme Snooks' work on the dynamics of living systems. Its focus is on how life on Earth is the outcome of the emergence of the “strategic logos” – or dynamic life-system – which is an entropy-defying, shock-deflecting system that has enabled both life and human society to prosper in a universe inhospitable to life. Life, god, science and civilization are all carried through space and time on board the “ark of the Sun,” as they were similarly perceived to be in the solar barque of the ancient Egyptians.

Social Evolution and History 4, 1 (March 2005), Exploring the Horizons of Big History. This was a special, theme issue of the journal, *Social Evolution and History*, which led to the first international conference on big history, held at the International University of Nature, Society and Humanity, in Dubna, Russia, in the following November. Systems theorist Graeme Snooks served as the guest editor.

Andrew Sorkin, *So Bill Gates has this Idea for a History Class ...*, *New York Times Magazine*, 5 September 2014, URL: ([http://www.nytimes.com/2014/09/07/magazine/so-bill-gates-has-this-idea-for-a-history-class.html?\\_r=0](http://www.nytimes.com/2014/09/07/magazine/so-bill-gates-has-this-idea-for-a-history-class.html?_r=0)). This is a high-profile report about big history and the Big History Project (see above) in a special edition of the *New York Times Magazine* devoted to education. It engages in a discussion of the big history work of Bill Gates, as well as historians David Christian and William McNeill.

Fred Spier, Wiley-Blackwell website for *Big History and the Future of Humanity*, 2015, URL: ([bighistory.info](http://bighistory.info)). This website contains an overview of Spier's works on the topic of big history. His efforts at refining and promoting big history are evidenced in his many articles, books and other forms of outreach.

Yue Sun [孙岳], *超越人类看人类？——大历史批判* [Transcending Humanity to Discover Humanity? A Critique of Big History], in: *史学理论研究* [Historiography Quarterly], 4 (2012), pp. 159–160 (Chinese publication). This essay was an introduction to big history for a Chinese academic audience and was presented as a critique. While acknowledging the validity of interdisciplinary effort and the larger visions of big history, the paper questions the field's

primary focus on energy flow, complexity, Goldilocks principles and other empirical concepts for defining humanity and human history – to the neglect of, say, human emotions and belief systems.

—, 从“大历史”到“中国梦”——全球思想史的遐思 [From “Big History” to “China Dream”]: Visions of Global Intellectual History], in: 史学理论研究 [Historiography Quarterly], 2 (2015), pp. 18-21 (Chinese publication). This paper rethinks the nature of big history and other critical issues confronting China and the world, from the perspective of the budding movement of “global intellectual history.”

—, The Tao of Big History: The Chinese Traditions, in: Barry Rodrigue / Leonid Grinin / Andrey Korotayev, eds., From Big Bang to Galactic Civilizations: A Big History Anthology, Volume 1, Our Place in the Universe: An Introduction to Big History, Primus Books, 2015, 235–246. Big history locates humanity in a single evolutionary process. It is in this sense of uniting cosmic and human histories that the Chinese have a big history tradition of their own, as exemplified by the ancient historian Sima Qian. Over the past decades, Chinese historians have managed to pick up this ancient thread and merge it with Marxist concepts of historical science. Meanwhile, a number of other scholars have contributed to China’s big histories by pointing to human-nature relationship as a central theme. This paper illustrates one of the significant independent developments of big history thinking around the world, both in the ancient world and in the modern age.

Antonio Vélez, Del Big Bang al Homo sapiens [From Big Bang to Homo sapiens], Villegas editores, 2004, ISBN 978-9588160689 (Spanish publication). A mathematician and electrical engineer in Colombia, Professor Vélez independently conceived of a big history paradigm in the 1980s. This led him to begin a three-volume explanation of existence. This is an updated edition of his first volume, initially published in 1998. The second volume is *Homo sapiens* (2006). The third volume is in process. His work represents another example of how the modern form of big history developed independently around the world.

Joseph Voros, Macro-Prospaction: Thinking about the Future Using Macrohistory and Big History, at: Global Future 2045 International Congress, 17–20 February 2012, Moscow, Russia, online at the congress website, (<http://gf2045.com/video/>). By the use of both historical and macro-historical models, we may look for insights about potential futures at a very deep level. Perhaps the grandest model currently available for use in this way is cosmic evolution, which includes the specific question of how evolution has played out here on Earth, namely, what has come to be known as “big history.” This paper introduces the elements of the generic foresight process framework and a thumbnail sketch of some of the issues that we may need to confront at the civilizational, planetary and even species level as we navigate our way into the future.

—, Profiling “Threshold 9”: Using Big History as a Framework for Thinking about the Contours of the Coming Global Future, in: Leonid Grinin / Andrey Korotayev, eds., Evolution: Development within Big History, Evolutionary and World-System Paradigms, Uchitel, 2013, pp. 119–142. Big history provides a framework for understanding broad contours of the past, but to what degree can it be used for the future? This paper considers humanity’s next major threshold,

following eight previous ones – a slowly unfolding collapse or ‘descent’ over decades or centuries towards a society characterized by ever-declining access to fossil-fuel-based energy. Such a trajectory clearly has implications for the level of human complexity. This suggests undertaking an anticipatory program of continuing research and exploration into both the underlying nature and the emergent characteristics of the coming transition to “Threshold 9.”

—, *Big Futures: Macrohistorical Perspectives on the Future of Humankind*, in: Barry Rodrigue / Leonid Grinin / Andrey Korotayev, eds., *From Big Bang to Galactic Civilizations: A Big History Anthology, Volume 3, The Ways that Big History Works: Cosmos, Life, Society, and our Future*, Primus Books [Forthcoming 2016]. Big history brings us from the big bang to the present day. But it is in our nature to not merely seek to understand our past but also to comprehend the future. This chapter examines macro-perspectives on the future and considers some potential outcomes, as well as our possible fate as a species.

Wenhu Ye [叶文虎], *论人类文明的演变与演替* [Evolvement and Substitution of Human Civilization], in: *中国人口·资源与环境* [China Population, Resources and Environment], 20, 4 (April 2010), pp. 106–109 (Chinese publication). This paper employs a holistic perspective and discusses a succession of four human eras – primitive, agricultural, industrial, and environmental. In the latter (present) era, which corresponds to the Anthropocene, humanity is compelled to transform, in order to sustain itself under rapidly changing conditions. The author has produced a number of related pieces on this theme in recent years, being an environmental scientist by profession.

Weibin Zhu [朱卫斌], “大历史”与中国高校世界史教学评论 [Big History and College-Level World History Teaching in China: A Comment], in: *历史教学* [History Teaching], 1 (2012), pp. 67–70 (Chinese publication). This is a thoughtful reflection by a Chinese world historian on big history. Professor Zhu argues for the need to rethink and reform the traditional world history courses, in order to confront new global challenges.