

International Big History Association

Members' Newsletter

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Timespirals

*Karen Kudebeh
TimeTrace, Inc.*

Adults as well as children need a basic grounding in Big History, not only because it's the job of each generation to pass on what's important to the next one, but also because the challenges of our times can only be addressed by acknowledging our interdependence with all life. Adolescents, especially, are disparaged as "thinking the universe revolves around them," while those making such comments roll their eyes and shake their heads, as if to claim they are any different. What if we could teach Big History while accepting that most of us act as if the universe revolves around us, and then acknowledge

Big History: Interdisciplinary Conversations Provide Comprehensive Narrative

Denise Scammon, Lewiston, Maine

From Big Bang to Global Civilization: A Big History Anthology (University of California Press, 2013) portrays reality in its entirety. Each essay contributes to the wide selection of topics arising from a diverse array of sciences and humanities and arts that tell the Big History story. The subject of Big History is similar to a big movie picture show that uses many different characters who interact to form a cohesive story. Imagine that each character in the Big History story represents a discipline, each contributing knowledge that informs and supports research done under the auspices of a different discipline. Interacting with each other in fresh, new ways, the disciplines converse about the origin story, the world as we know it, and our own place in it. The results of these conversations found within the covers of this comprehensive book enable the reader to benefit from a broad, interdisciplinary work in a way that no single discipline can do on its own merits.



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that it's only when we experience belonging to a larger whole that our identity expands to include others. Let's honor our human need to belong, and then use this basic need to structure the story of how we're connected to everything and everyone through time.



I hope to spark your imagination with a teaching tool we've created and coined as "timespirals," and to offer the Big History community these visuals for use in giving context for time-related information. Fully

65% of us are visual learners (vs. the other 35% who learn primarily through text, audio, or kinesthesia).

These spiral timelines help orient people within the vastness of Deep Time and teach people from ages 8 to 108 whose learning preferences span the spectrum. Our goal is to support "Big History Literacy" and inspire people with the understanding that the life of every one of us unfolds as a unique expression of the Universe, starting with the Big Bang some 13.7 billion years ago.

Each set of timespirals includes 6 views of time, and makes use of color, text, and graphics. The first 4-cover the longer-view time periods of:

- 13.7 billion years to Now: *We Belong to the Universe* – tracking 9 billion years of galaxy and star evolution including lifecycles of different sizes of stars, leading to the emergence of Earth some 4.5 Billion years ago, and using the visual of Earth as it appears today.
- 4.5 billion years to Now: *We Belong to Earth* — showing colors of the planet's surface as if photos

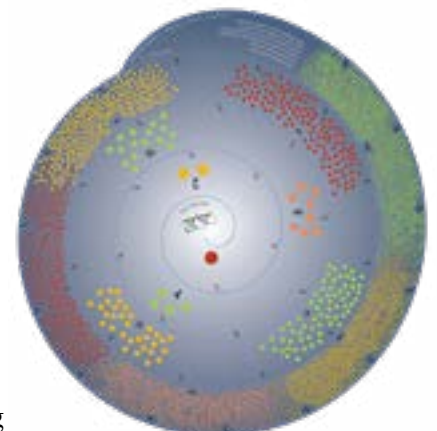
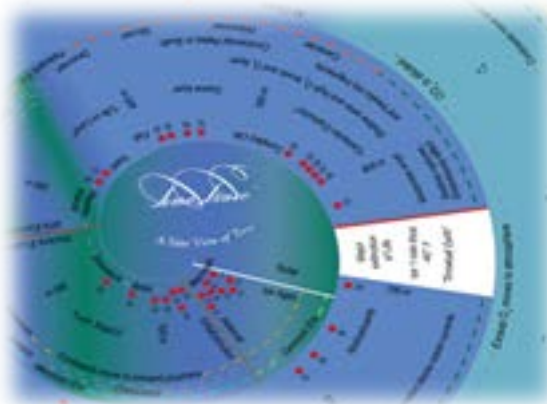
had been shot from space every 100 million years to the present, and presenting the major cosmic, geologic, atmospheric and biologic events and processes that have occurred.

- 570 million years to Now: *We Belong with All Life* — chronicles the story of plate tectonics, major geologic events and emerging life. It also identifies "common ancestors" where human lineage coincides with the lineage of other present-day life forms.
- 5,000 years to Now: *We Belong with Perspective* — using the powers of 10 (thereby summarizing events for the past 5,000- 50,000- 500,000 - 5 million - 50 million - 500 million and 5 billion years) -- this spiral graphically illustrates that human civilization covers only 1 millionth the span of Earth's story.

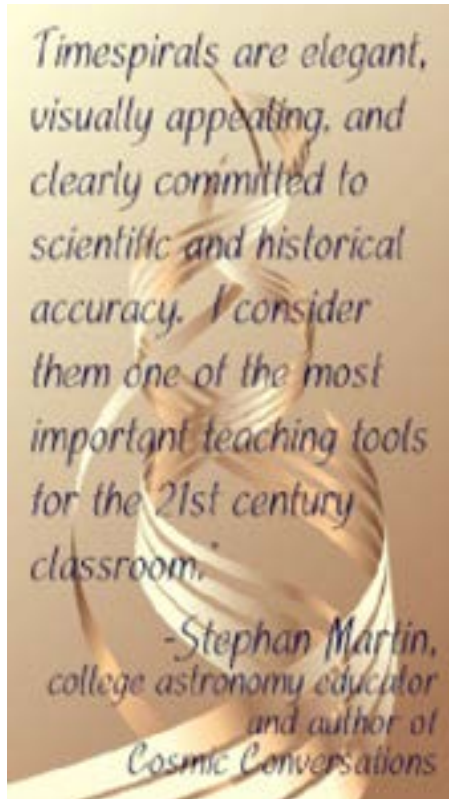
I want to acknowledge up front that I am not an historian. In fact, the only subject I knew I'd never

major in was History, since it was the most tedious high school class I ever took, taught by a football coach who had us memorize dates of disassociated events concerning wars and empires. Fast-forward 20 years: I heard a talk about Thomas Berry's work — masterfully recounting the 14 billion year story given to us by science, which also

included humans fitting within this Big Picture. I was *deeply moved* by this new understanding. I think that many educated people need hard evidence to accept that we humans really do belong here! As my chosen profession was environmental policy planning, it was too easy to see Humans as The Problem: degrading



Earth and taking no responsibility for our actions. The story of our belonging completely changed my perspective and challenged me to find a way to share it with others.



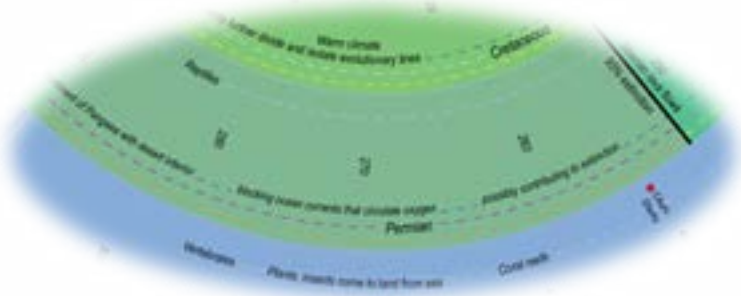
This is why the *We Belong* timespirals came into existence. Since the present moment is in the center, we humans are also in the center (together with all other species alive today). No matter what the scale -- 13.7 billion years or 360 years, the visual always has “Now” and “Us” in the center. The timespirals come in 2 versions: as 2-D, they portray humans

as surrounded by everything that has come before. Curiously, such a visual reflects a perspective common among indigenous peoples that we are always surrounded by the ancestors: star ancestors, mineral and plant ancestors, animal and human ancestors. In their 3-D form, the timespirals portray humans as “standing on the shoulders” of everything that has come before us. Both versions use graphics and color to augment text written onto a sequential timeline. The 2-D version is ideal for teaching

purposes since it can easily be seen by a small audience; the 3-D version includes a turntable to assist the kinesthetic learner. Both versions display as “art” while incorporating our story onto the spirals.



What happens when we adopt the perspective of each person being supported by all that has come before? Many people feel special -- within the context of *relatedness* to everything and everyone. It’s the relatedness brought out by the knowledge — confirmed by science — of belonging and



emergence. This understanding can help us in our own lives — consider, for example, the relationship between the mass extinctions of life and the traumas of our lives: both can seed new possibilities for the future.

The final 2 timespirals — *We Belong with Generations Past* and *We Belong to Dreams of the Future* — most directly invite personal interaction with both the past and the future, and can serve to draw people into the larger story told by Big History. Since all the timespirals are laminated to enable personalizing them with a permanent marker, people are encouraged to write the names of their ancestors onto the one that goes back to 1650.



Similarly, the one that goes into the future invites people to write down their visions— on behalf of 7 generations yet to come. People of any age can become engaged in seeing their family tree against the backdrop of

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Karen Kudebeh continued

world events and imagining a future of possibility (including fears about the future, giving space to express them, and then having a friend/educator/parent encourage the envisioning of an alternative possibility.) When done in the context of Big History, our lives seem bigger, more connected, more significant. Possibilities open up when the context is large enough.

I look forward to sharing the spirals at the IBHA conference as an Artistic Presentation. Because this Deep Time perspective serves as the context for all kinds of narratives, I want to honor the location in which we will congregate: the Great Lakes bioregion. The spirals can serve as a Big History visual for telling any time-related story, so I will use them to share an account of how the Great Lakes came to be. Places, as well as people, deserve to be honored as special and central in the continuing unfolding of the universe.

Karen Kudebeh showing spiral timelines to students of Big History.



Karen Kudebeh is the founder of TimeTrace, Inc. She is passionate about sharing Big History using spiral timelines as visuals. All versions of the timespirals will be sold at the conference, and customers can save shipping costs by carrying them home. For those not attending or preferring to have timespirals mailed, TimeTrace is having a Big History Special during the month of July. See <http://www.timetrace.com>.

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Big History Anthology continued

Each chapter delivers research conducted and then condensed so as to present an overarching presentation of a vast amount of knowledge. It is a collaboration among creative thinkers and researchers whose combined work describes the history of everything. It's global: The authors come from all over the world. It's scalable: The research takes the history of the Universe from the micro

level to the macro level. The reader follows the Big History story, beginning with events surrounding the Big Bang, then transforming the Universe into an increasingly complex place. History on a large scale is today's new narrative for explaining reality. Big History unifies what we know about the history of the Universe into a contemporaneous, expansive story composed of many sciences, humanities, and

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Big History Anthology continued

arts. Big History began coming together as a field of study in the 1980s. It was a product of the Space Race and the Cold War. Essentially, it seeks to make sense of the discoveries that have been isolated in the many silos of academic departments. As of today, there are about fifty courses on Big History that are taught in universities around the world, as well as many other courses that include aspects of Big History. Their number is growing very fast. Most of these courses are taught in the United States, but other geographic clusters are found in Australia, the Netherlands, Canada and Russia.

Many of the Big History traditions developed independently in various locations around the world. Several authors in the anthology give us insights into some of these “independent inventions,” such as Osamu Nakanishi and Nobuo Tsujimura in Japan, and Sun Yue and Zhu Weibin in China. There are five major texts about Big History currently in use: David Christian’s *Maps of Time* (University of California Press 2004), Cynthia Brown’s *Big History: From the Big Bang to the Present* (The New Press 2007), and Fred Spier’s *The Structure of Big History: From the Big Bang until Today* (Amsterdam University Press 1996) and *Big History & the Future of Humanity* (Wiley-Blackwell 2010). Each of these authors has essays in this anthology. There also have been numerous essays published about Big History in a variety of journals and almanacs, in print and online, notably in *Social History & Evolution*, *World History Connected*, and *Evolution*. This anthology is scheduled to be released in 2013.

The inspiration for this volume came out of the Russian collaboration by Universal Historians with Western scholars of Big History and Cosmic

Evolution. Several of the authors in this anthology had earlier participated in conferences in Russia and in publications with the journals of the Uchitel Publishing House. While a few authors have had their works previously published, many of the essays have not been published before, and none have been published in an anthology. In fact, a book such as this has never before been published, and, as such, provides a crucial turning point in the field of interdisciplinary education.

This anthology was conceived and edited by Drs. Barry Rodrigue, Leonid Grinin, and Andrey Korotayev. Rodrigue is a professor at the University of Southern Maine and serves as International Coordinator of the International Big History Association (IBHA). Korotayev is Head of the Department of Modern Asia and Africa at the Russian State University for the Humanities (Moscow). Grinin is an historian, as well as the founder and director of Uchitel Publishing House, which is devoted to social science publications in Russian and English. They had collaborated earlier in producing the almanac, *Evolution: A Big History Perspective* (2011). In the present work, their comprehensive narrative is divided into multiple sections, including: “Evolution & Understanding,”



Co-editors Leonid Grinin, Barry Rodrigue, and Andrey Korotayev celebrate the contract signing.

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“How Big History Works,” “Interdisciplinary Development of Big History,” “Big Culture,” “Little Big History,” “Teaching Big History,” “Visions of the Present & Future,” and “Creativity.”

Kudos should go to the University of California Press for the publication of this anthology which can be useful in many venues, as a textbook, a reference book, as well as for the general public.

This distinguished university press “enriches lives around the world by advancing scholarship in the humanities, social sciences, and natural sciences,” according to its mission statement. Its impressive list of titles includes bestsellers such as *The Autobiography of Mark Twain* (2010), which Sam Clemens deferred for publication a century after his death. They also published, *Maps of Time: An Introduction to Big History* by David Christian, which is the primary Big History textbook in use around the world. President of the International Big History Association (IBHA), Christian is also a co-founder, with Bill Gates, of the Big History Project, which is building a free online syllabus in Big History for high schools around the world. Christian has essays in this anthology, including, his recent paper, “History & Time.”



The preface to the anthology begins with a thoughtful essay written by Roberta Bondar, a physician from Toronto (Canada), who was an astronaut/neurologist aboard the space shuttle, Discovery, in 1992. Her credentials include degrees in zoology, agriculture, experimental pathology, neurobiology, and neuro-ophthalmology. Among her distinctive honors are four photo-essay books that include photos she took of Earth from outer space. In the preface, Bondar describes the emotions she felt when viewing Earth

from outer space and how the blackness that surrounds it made the return to Earth all the more sweet. The blackness of outer space brought the realization that as far as present-day science has discovered, there is no other planet like Earth in the Universe. Bondar’s profound insights which arise from her space travel start a conversation about symbolic boundaries, how studying the physical effects of space-living on the human body can benefit humans living on Earth, and how space travel can change our concepts of the world. She writes, “Lifted above planet Earth by whatever physical mechanism to float in space, we are gifted with an opportunity to float out

of ourselves to see what has become of us.” Bondar asserts that we will learn more about our world and Big History by asking big questions and seeking answers from interdisciplinary sources.

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The reader will find that the section on “Evolution & Understanding” presents an introductory overview of Big History that explores scholarship and education and how improvements can further interdisciplinary teaching and learning. G. Siegfried Kutter, a retired NASA astrophysicist and presently a professor



at Colorado Mountain College, in Breckenridge, Colorado, authored “A Brief Account of the Science of Big History,” which summarizes contemporaneous understanding of the history of the Universe. This

essay, written in a non-technical style, is a good place to start when introducing a comprehensive Big History story that begins with the Big Bang 13.7 billion years ago followed by the formation of structure in the Universe. The narrative explores the roles of the different characters in the story of the Universe, including the formation and composition of stars, galaxies, and our solar system. Progressing from the small scale to the large scale, the reader

follows the story as the world becomes increasingly complex with the appearance of life on Earth and the development of human life forms. Expertly, Dr. Kutter weaves in the development of agriculture in the distant past, through living arrangements, writing and communication, science and industrialization, to today’s global economy. This essay will certainly arouse greater interest in the facts surrounding Big History and new developments in the field.

Antonio Veléz Montoya, of Medellin, Colombia, writes in his essay, “Mathematical Modeling, the Big Achievement,” that using mathematical modeling to represent the real world with abstract symbols allows scientists to miniaturize the scale of the world. Abstract mathematical symbols represent the decreased scale, taking something unimaginably large and turning it into a more easily comprehended and more manageable scale. This is reminiscent of movies that make use of wide and telephoto lenses. The wide lens shows more of the world, but things appear smaller. The telephoto lens gets up close to objects which make them appear larger, but less of the world can be seen through the telephoto lens. But the size of the world and objects in it do not change, just the tools used to view it. Both views are necessary to provide a comprehensive understanding of nature and its rules; therefore, mathematical modeling has become one of the tools used by researchers to overcome limits to discovery in the field of Big History.

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Authors Walter Alvarez and David Shimabukuro of the University of California at Berkley, and Alessandro Montanari of the Coldigioco Geological Observatory in Italy, explain in the essay, “Ex Libro Lapidum Historia Mundi: Reading History Written in Rocks,” that sharing of knowledge among historians, astronomers, geologists, and paleontologists enables a more thorough understanding of history which can be discovered in the Earth’s rocks. The authors note that this interaction among disciplines provides details about the evolution of microfossils, reversals in the Earth’s magnetic field, and the giant impact that caused the mass extinction of the dinosaurs. This essay provides an exciting narrative about Big History that is accessible to everyone.

Lowell Gustafson describes how “Big Politics” serves as a conceptualization of social interaction on a scale that spans nature and the universe. This concept can be seen as a sub-field of Political Science, one that greatly extends traditional sub-fields, such as International Politics or Political Theory. Like these sub-fields, it presents a scientific narrative explaining the development of polity over time and within defined locations. Polity, or the sustained, ordered relations among members of a society, requires an analysis that is based in the natural sciences as well as mathematics. This analysis presents an account of the development of polity or the increasing complexity of relations between members, with simpler units forming new combinations with new properties. It claims that human polity is a complex development that evolves from earlier polities, rooting human political nature within a broader conception of nature.

An essay written by Ji-Hyung Cho, of Ewha Woman’s University, in Seoul, Korea, titled, “The Little Ice Age & the Coming of the Anthropocene,” examines the coldest period in the history of humanity in the last 10,000 years and the agents that caused it, which include solar variability, volcanic activity, human activity, sulfate aerosols, and greenhouse gas. Cho explains the human response to the LIA: “Responding to the LIA ... the human species began to exploit the nonrenewable resources

of the Earth as never before. The human response to the LIA remains in the Earth’s ecosystems. We can see the beginnings of the Anthropocene at the height of the Little Ice Age.” Both narrative and empirical data have a place in this textbook. His essay is complete with statistics and charts that enable one to see the big picture. Science fiction writers cannot make up stuff as exciting as Cho’s research.

The anthology includes creative works, too, such as a poetic narrative, “The Penultimate Why,” by Brijesh Singh, a member of the Indian Police Service in Mumbai. Singh balances his work as a police officer with poetry and philosophy. In his piece, he examines how asking questions about the world around us leads to a search for answers which provide knowledge but also reveal that we will always be seeking answers because our questions will never cease. We will always be knowledge seekers. We will always ask questions. In this brief work, Singh advises that because of the interconnectedness of everything in our Universe, the sciences, humanities and arts – conversing together – provide a comprehensive answer. Yet the answers we get today may change with new discoveries tomorrow.

The reader will be fascinated with another creative look at Big History as found in the essay, “Brain Stretching: Art & Big History,” by Paula Metallo, of the Coldigioco Geological Observatory in Coldigioco, Italy. Metallo writes, “To me, the most fascinating aspect of modern culture and Big History is the awareness of interconnectedness, the weaving of everything together on our planet and beyond, providing a new place to contemplate.” She then outlines the reasons why she believes art helps reveal patterns and how those patterns enable us to stretch our brains to see things with new understanding. She discusses how the world has become smaller through technology, ubiquitous communication tools, and ease in travel, but at the same time, she acknowledges that people want to connect while retaining distinct cultures and individual identities. She also examines the richness that comes to the human spirit through art, noting that art is subjective. Her logic provides a new, wider context for Big History.

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A link between music and Big History is examined in an essay by Alessandro Montanari and Gabrielle Rossetti, also of the Coldigioco Geological Observatory, that is titled, “Dances with the Earth: Geophonic Music.” Dr. Montanari and Mr. Rossetti write about geophonics – the sounds of the Earth – from which they have composed music. They describe the manner in which numerical geological data is turned into music through “Frankenstein,” (German for “true rock”), an original computer program. The creative connection between geology

and Earth’s history and music reveals yet another interdisciplinary conversation that takes place in the Big History show.

Another essay was written by Craig Benjamin, of Grand Valley State University, in Grand Rapids, Michigan, and is titled “The Big History of Jericho.” Dr. Benjamin examines the roles of the physical environment, technology, and human interaction and the rise of early agrarian civilizations through the story of the origins and history of Jericho, the oldest known city on Earth. How did Jericho come to be the oldest city? The story of Jericho’s 14,000-year survival includes conversations between geography, biology, and human history. The reader will be fascinated by the logic that ties the different disciplines together in this essay.

Douglas Northrop and Cameron Gibelyou, of the University of Michigan in Ann Arbor wrote, “Webs of Knowledge: Crossing Disciplines to Teach the Universe,” which gives practical examples of

how the vast subject of Big History can be taught. Through examples of coursework, the authors provide a foundation for putting together an interdisciplinary Big History course that involves guest lecturers and students teaching others what they have learned about the subject. The authors write, “Although it is admittedly complex (logistically and intellectually) to build a course that relies on so many guest lecturers, it can succeed with careful attention to creating a spine of readings, assignments, discussion sections, and linking lectures for students.” This is interdisciplinary education at its finest. Other authors in this section include Dutch educator Jos Werkhoven, who discusses the Big History tradition in the Montessori School



tradition, and Erika Gronek, who wrote a renowned children’s story of existence – “And then there was you...!”

Some of the authors in this anthology promote the study of Big History through The Eurasian Center of Big History & System Forecasting at the Russian Academy of the Sciences. These authors include Akop Nazaretyan, who wrote “Mega-Evolution & Big History,” which compares Russian and Western

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Big History Anthology Concluded

traditions of Big History. Two of the editors, Leonid Grinin and Andrey Korotayev, teamed up with Robert Carneiro of the American Museum of Natural History in New York City and Fred Spier of the University of Amsterdam in the Netherlands to write, "Evolutionary Megaparadigm: Potential, Problems, Perspectives." Their essays provide insight into education, advocacy, and theories related to Big History.

Appropriately, the last section focuses on our future. A series of exciting and thoughtful essays lay out aspects of our potential and our prospects. Renowned science-fiction author (and computer scientist) Vernor Vinge addresses the Singularity, a term he first adapted from physics to society. Frank Niele, an engineer with Royal Dutch Shell investigates our energy future by using an exciting new paradigm. And Russian nuclear physicist Alexander Panov and Australian future studies scholar Joseph Voros look to galactic civilizations. In addition to essays, poetry, and other traditions, each section is started by a "Pathway to Big History," which describes how a big historian arrived at their way of thinking about universal matters. These personal vignettes provide warm and intimate views of a new field's development. For example, Katya Sazhienko, a student at the International University of Humanity & Nature in Dubna, Russia

describes her move from a small coal mining city in the Urals and how the universal humanism of Russian literature inspired her to seek more from life, and then how a course with her professor, Akop Nazaretyan, set her on a Big History pathway.

Taken in its entirety, *From Big Bang to Global Civilization: A Big History Anthology* has the potential to bring the reader face-to-face with new connections and ideas about the Universe realized through the interaction of the diverse sciences, humanities and arts. The essays in this anthology demonstrate the importance of knowing about time-space, quantum physics, gravity and the elements to further understand cause and effect between humans in the agrarian, industrial and modern eras. This knowledge gives us clues as to how we can replenish our living planet. Upon learning about a new discovery that will affect our universe and/or the human race, it is our responsibility to take a critical look at scholarly resources for more information. This anthology provides the research which can lead to creative solutions such as those that sometimes come about from using technology for purposes other than the original intention. The creative, forward-thinking people, who have shared their knowledge and thoughts about issues relevant to Big History, provide a firm foundation for the stewardship of our planet and humanity. This anthology will advance our progress.

The website of the Eurasian Center for Big History & System Forecasting has been released recently at <http://www.sociostud.org/ecbsf/mission/>. The Eurasian Center for Big History & System Forecasting (ECBSF) seeks to develop a unified and interdisciplinary history of the Cosmos, Earth, Life and Humanity. It also seeks to develop system forecasting of social, political, demographic, ethnic and cultural processes at regional and global levels.

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