Volume 1, Number 6 *December 2011*

The IBHA supports university level research in Big History as well as education about Big History for all ages of students. In this issue of our members' newsletter, we highlight some of the exciting work being done by IBHA members on childhood Big History education. The stories we tell our children – the messages we send them – the lessons we teach them – are all topics that these IBHA members have long considered.

Big History and Cosmic Education

by Michael Duffy, M.Ed., and D'Neil Duffy, M.Ed.

It is like a glance in a mirror that startles you.

The reflective parallels between Big History and Cosmic Education are many and striking.

Both involve the time period from the beginnings of the universe to the present and beyond. Both are broken down into a series of separate chapters that are part of the whole but rooted in different scales of perspective. Both depend on a story-based pedagogy to explain the amazing content under study.

But the student studying Big History is a young adult looking for a way to make sense of the world he or she is about to enter. The startling image staring back from the mirror is an elementary-aged version of this young adult, a 6 to 12-year old child engaged in the study of Cosmic Education.

We discovered this time warp reflection when we

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Universe Story Trilogy for the Elementary Level

by Jennifer Morgan,
Illustrations by Dana Lynne Andersen

Inspired by the work of Maria Montessori, Thomas Berry, Brian Swimme, this series for the elementary level (and the child in all of us!) is in the form of a letter from the Universe to Earthlings. Used in classrooms around the world, particularly Montessori schools which follow the Cosmic Education

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The Universe Verse

Free Big History Comic Books *by James Lu Dunbar*

WARNING! My books contain graphic depictions of scientific knowledge which may lead to decreased ignorance and heightened sensations of awe and wonder.

The Universe Verse is a series of three scientifically accurate, rhyming, comic books about the origin of

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came across David Christian's wonderful lecture series "Big History: The Big Bang, Life on Earth, and the Rise of Humanity," published in DVD format by the Learning Company. As we watched his lectures, we were intrigued and delighted by the parallels with our own book, *Children of the Universe: Cosmic Education in the Montessori Elementary Classroom*.[1]

What Christian was advocating was the university version of what we try to teach in the Montessori community of elementary education.

Cosmic Education is an educational approach founded by the Italian physician-educator Maria Montessori in the first half of the 20th century and developed in detail by her son, Mario Montessori, after her death in 1952. Our book is an attempt to summarize that elementary curriculum and flesh out parts of it with the insights of modern science.

It was that rapidly expanding body of scientific knowledge before and after the turn of the century that created the atmosphere prompting Christian and other academics to expand the study of "history" beyond the scope of written history and even to the time periods before humans or the Earth itself existed. He maintained that History only makes sense in this broader context of going back to the beginning.

Maria Montessori, while not privileged with all of the scientific discoveries of recent decades, nevertheless had the visionary insight that the education of young children could not ignore the context of the universe itself.

> *"Let us give the child a vision of the whole universe…If the idea of the universe be presented to the child in the right way, it will do more for him than just arouse his interest, for it will create in him admiration and wonder…The knowledge he then acquires is then organized and systematic; his intelligence becomes whole and complete because of the vision of the whole that has been presented to him...No matter what we touch, an atom, or a cell, we cannot explain it without knowledge of the wide universe."*
>
> *- To Educate the Human Potential, 1948*[2]

Cosmic Education is an educational approach founded by the Italian physician-educator Maria Montessori in the first half of the 20th century and developed in detail by her son, Mario Montessori, after her death in 1952. Our book is an attempt to summarize that elementary curriculum and flesh out parts of it with the insights of modern science.

The result of this educational approach, at both the elementary and the university levels, is a curriculum that unifies all the subjects of human knowledge into one, coherent, continuous, and comprehensive study. In the introduction to the course guidebook for Christian's lecture series, we read:

> *"Big history surveys the past at all possible scales, from conventional history, to the much larger scales of biology and geology, to the*

1 Duffy, Michael and D'Neil. *Children of the Universe: Cosmic Education in the Montessori Elementary Classroom*. Parent Child Press, Holidaysburg, PA, 2002)

2 Montessori, Maria. *To Educate the Human Potential*. Kalakshetra Publications. Madras, India. 1973 (first published in 1948).

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> *universal scales of cosmology. It weaves a single story, stretching from the origins of the Universe to the present day and beyond, using accounts of the past developed within scholarly disciplines that are usually studied quite separately.*
>
> *"Human history is seen as part of the history of our Earth and biosphere, and the Earth's history, in turn, is seen as part of the history of the Universe. In this way, the different disciplines that make up this large story can be used to illuminate each other. The unified account of the past assembled in this way can help us understand our own place within the Universe."*[3]

In *Children of the Universe*, we depict this as a series of concentric circles (ellipses, technically) representing the successive chapters of the story, with each chapter representing a story within the previous story and all of them contained within the story of the universe itself.

Thus, the story of the stars and the solar system (Chemistry and Physics) is part of the story of the universe (Astronomy and Cosmology), the story of the Earth (Geology and Geography) is part of the story of the stars and solar system, the story of life (Biology) is part of the story of Earth, and the story of humans (History) is just part of the story of life on this planet.

Christian divides his study into a series of thresholds indicating new levels of complexity that move evolutionary change from the Big Bang, through all the stages of cosmological, biological and social development, toward the present and beyond. He describes eight thresholds to the present time.

The Montessori curriculum is based on five "great lessons" – the Creation Story, the Timeline of Life, the Timeline of Humans, the History of Writing, and the History of Math. In our book, we suggested expanding that list to fill in some gaps between the great lessons.

The Creation Story includes the first three thresholds of Christian - Creation of the Universe, Creation of the Stars, and Creation of Chemical Elements in Dying Stars. We proposed a new Montessori story corresponding to the Creation of Planets and Earth to bridge the gap and bring us to the Timeline of Life, which corresponds to Christian's fifth threshold, the Creation of Life on Earth. The Timeline of Humans, and the embedded stories of language and math, corresponds to the final three thresholds in Christian's outline, beginning with the Creation of Our Species.

As Christian notes, each of these thresholds represents a different scale of study. Those scales are represented concretely in the Montessori curriculum by a series of timelines – from a "Clock of Eons" representation of the geologic time periods of planet Earth; to the expansion of the last hours of the clock into the "Timeline of Life," when life gets too complicated to study in the small space on the clock; to the "Timeline of Humans," when the tiny strip of red at the end of the Timeline of Life gets expanded to allow space to study our species in more detail.

In keeping with the concrete, manipulative nature of Montessori education, each chapter of the story comes equipped with a whole range of materials that make the concepts accessible to young children and

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3 Christian, David. Introduction to course guidebook for "Big History: The Big Bang, Life on Earth, and the Rise of Humanity," The Teaching Company, Chantilly, VA.

Michael and D'Neil Duffy continued

allow them to actively discover many things on their own and expand their knowledge beyond the initial information the teacher offers them.

This "Cosmic Education" curriculum of Montessori allows the youngest elementary students to be introduced for the first time to the study of Big History, laying the foundation for succeeding levels. It's a lot like the way we used to study "World History," at the elementary level, again in high school, and eventually at the college level. It gives students a spiral on which to build their understanding of world history, going to higher levels of understanding and greater detail at each level of the spiral.

Big History is an understanding of the universe and of us as humans that has become the unavoidable path to scientific and cultural literacy in the 21st century. Montessori's Cosmic Education offers an opportunity to establish the first level of this modern form of literacy for children as young as 6 years old and to lay the foundations in the spiral of learning for our new century.

James Lu Dunbar continued

the universe, life on Earth, and the human race. The first two books are currently available for purchase as paperbacks, and are also free to the public in their entirety as high-resolution PDF eBooks. I've written, illustrated and self-published *Book 1: BANG!*, and *Book 2: It's Alive!*, and am currently working on *Book 3: Great Apes!*.

If this sounds interesting, you are welcome to download and read both books yourself. They are both available under Creative Commons licenses that grant you permission to copy and distribute them freely. To receive copies, email me at dunbarjam@gmail.com or you can take a look at them online (in low resolution) at JLDunbar.com. If you like them, please share them with anyone and everyone.

I've written and illustrated these books because I love science. I think the ideas they contain are important in a very fundamental way and I would like everyone to have access to them, especially children.

The purpose of these books is to make science as

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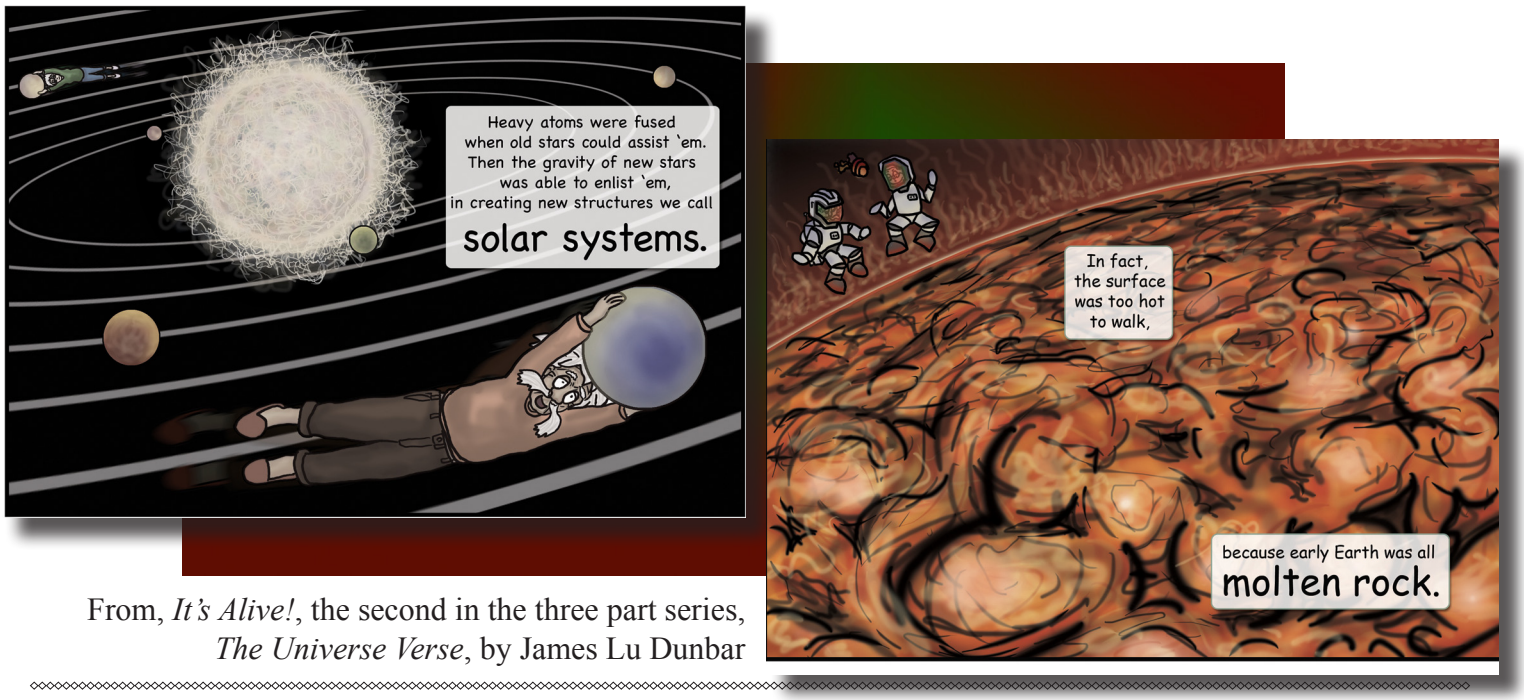
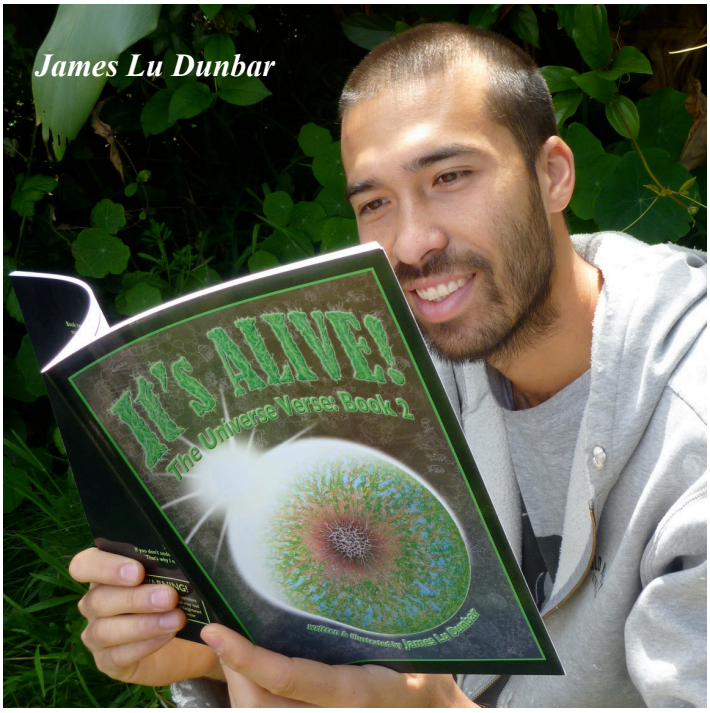


From, *It's Alive!*, the second in the three part series, *The Universe Verse*, by James Lu Dunbar



appealing and approachable as can be, for the broadest audience possible. Too many children (and adults) think they don't like science because they have not enjoyed the way it's been presented to them. This is a travesty because children are born with an innate curiosity that is the foundation of science, and there's no reason why that enthusiasm should disappear later in life. We all need to help nurture that curiosity because scientific literacy and innovation is going to be absolutely vital for future generations who will be facing a long list of new and challenging problems.

I began by researching, brainstorming and writing *The Universe Verse* back in 2007 in the public

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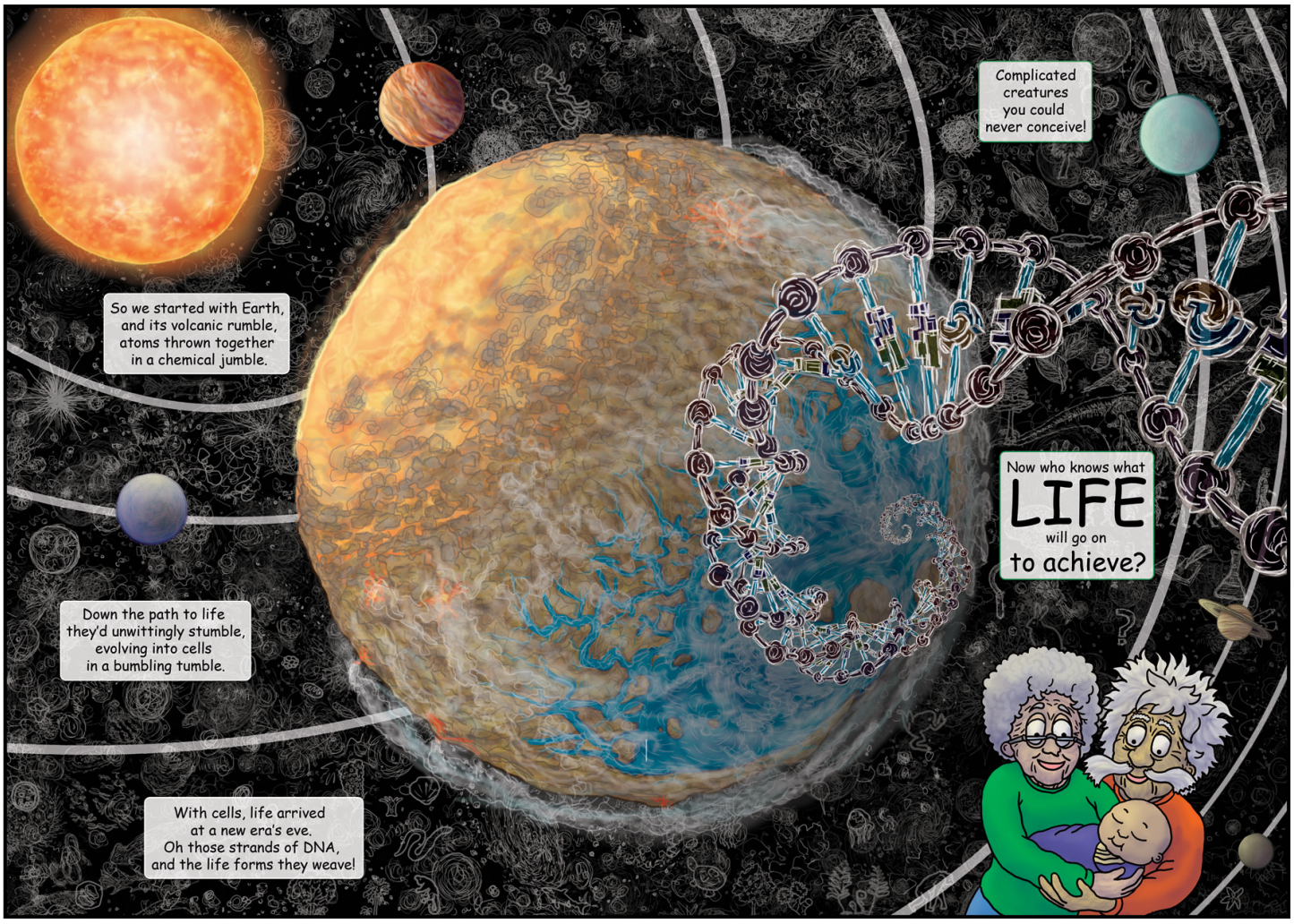

From, *It's Alive!*, the second in the three part series, *The Universe Verse*, by James Lu Dunbar

James Lu Dunbar continued

libraries of Boston. In 2009, I started the process of illustrating and publishing *BANG! The Universe Verse: Book 1*. I did the preliminary sketches in pencil, then scanned them into Photoshop where I painted the final illustrations in black and white using a Wacom tablet. I self-published the books using CreateSpace, an on-demand digital printing service run by Amazon. I have been selling them online with the help of publicity from bloggers, radio and newspapers, including: *The Washington Post*, *The Sacramento Bee*, *Bad Astronomy*, *Gizmodo*, *Skepticality*, *Groks Science Show*, *Parenting Beyond Belief*, *The Church of the Flying Spaghetti Monster*, and *The International Year of Astronomy* to name a few.

In order to illustrate *It's Alive!* in color, I had to upgrade my laptop. I was able to do so by raising money in advance using an online fundraising website called *Kickstarter*. I used the same illustration process for *It's Alive!*, but with an additional step at the end to add the color. Once again, I self-published the book and made it freely available to the public as a high-res PDF. Soon I will begin work on illustrating *Book 3: Great Apes!* about the evolution of the human race and the dawn of civilization.

If you'd like to learn more about my books, you can visit me online at JLDunbar.com.

Following is a quote from my very first review of *BANG!*, written in December 2009:

> "Dr. Seuss meets Carl Sagan.
> …The whole thing is wrapped in wonderfully written rhyme and richly detailed images. Even as someone with their degree in astronomy and a bookshelf full of astronomy texts, this is still one I would highly recommend and get as a gift for any astronomer, aspiring or professional."
>
> -Jon Voisey (*UniverseToday.com* / *TheAngryAstronomer.com*)

Jennifer Morgan continued

Curriculum, it has been endorsed by scientists and educators (see below). It is scientifically accurate and shows the interior evolutionary impulse toward higher levels of complexity. Each book has a story section, a learnings section that explores what the universe "learned," and a science concept section for teachers, parents and older students. About the series, Dr. Brian Swimme said, "In the magic of this story . . . suddenly, we have the feeling that we BELONG." And Thomas Berry, a cultural historian, said "The sooner children hear these words, the better off they will be." www.universestories.com

(Book 1) *Born with a Bang: The Universe Tells Our Cosmic Story*.
Dawn Publications, 2002. www.DawnPub.com

Covers the big bang through formation of the solar system, and includes essays by Brian Swimme and Thomas Berry. Endorsed by astronaut Edgar Mitchell, Princeton astrophysicist Gillian Knapp, Nobel Laureate (Physics) Leon Lederman, and many others. Winner of Learning Magazine's Teachers Choice Award. A Cosmic Story Mat and storytelling materials for the classroom to accompany this book are available from www.wasecabiomes.com

(Book 2) *From Lava to Life: The Universe Tells Our Earth Story*.
Dawn Publications, 2003. www.DawnPub.com

Covers the beginning of life through the extinction of dinosaurs. Endorsed by Lynn Margulis, Thomas Berry, Matthew Fox, Bill McKibben, Barbara Marx Hubbard, and others.

(Book 3) *Mammals Who Morph: The Universe Tells Our Evolution Story*.
Dawn Publications, 2006. www.DawnPub.com

Covers the mammal and human stories. Endorsed by primatologist Jane Goodall, Princeton anthropologist Alan Mann, science writer Michael Lemonick, Montessori educator Judi Bauerlein, and others.

"*Teaching and Researching Big History: Exploring a New Scholarly Field*"

Call for Papers; IBHA Conference, August 3 - 5, 2012

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The IBHA will be hosting the first ever international Big History conference on August 3 - 5, 2012 at Grand Valley State University in Grand Rapids, Michigan. The conference, whose title is "Teaching and Researching Big History: Exploring a New Scholarly Field," will be the largest gathering of big historians ever assembled. Participants will be housed in the Meijer Honors College on campus, and will participate in a range of panels, roundtables, lectures, pedagogical workshops, and other collegiate activities. At its conference and its other activities, the IBHA seeks not only to discover and create new knowledge, but to shape a future in which humanity understands its common origins and its common destiny.

On GVSU campus.

To submit your paper proposal or a panel proposal online, please click on the "Conference" link on http://ibhanet.org.

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