

SOFO naturalist



Each quarter SoFo features eco-links, written by a member or friend of the Museum. If you wish to submit an article please contact us.

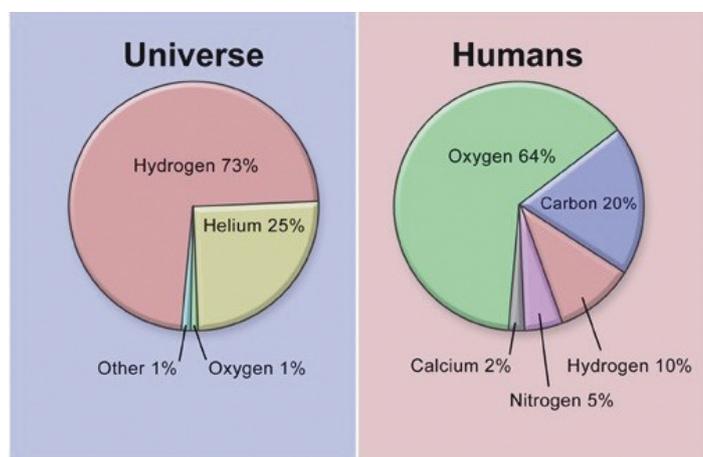
eco links

Are We Really All Connected?

by Judy Rall

It is tempting to think of ourselves as islands, each of us doing our own thing, occasionally bumping into one another in amity or enmity. I usually view myself this way. But the phrase “we are all connected” may not be just some airy, New Age, feel-good conceit. The dictionary definition of the word “connection” is: “A relationship in which a person or thing is linked or associated with something else.” Our material connection to everything, living and nonliving, has solid grounding in science.

Consider the elements on the periodic table. You may remember how it looks from high school chemistry class. Hydrogen is the first element on the upper-left corner; helium is in the upper-right corner; and the rest follow in a seemingly random order, forming the shape of a misshapen castle. These are the fundamental building blocks of everything. Ninety-six percent of humans are made up of just four elements: hydrogen, carbon, nitrogen, and oxygen. Call them the Big Four because all living things on earth are made of these elements in slightly different proportions. Hydrogen, the first element on the table, is part of water so it is everywhere on earth, absolutely necessary for life and luckily for us, the most abundant element in the universe. Where did this ubiquity come from?

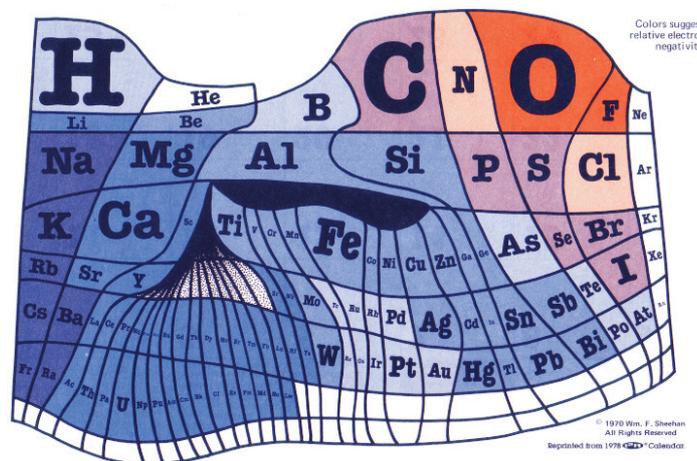


Relative abundance of elements in the universe and in humans by weight. CHANDRA X-RAY OBSERVATORY, Illustration: NASA/CXC/T. Truong

The answer is truly majestic—it was created during the Big Bang 13.772 billion years ago. Ten percent of the human body is composed of hydrogen, so we all have these original, ancient relics inside us.

You may be aware of another crucial element, iron. It is not part of the Big Four since it is much rarer, but it carries life-enabling oxygen in our blood. That iron is essential to all mammals is not surprising but that it is necessary to living beings, including fruit flies, plants, bacteria, even cancer cells, is less known. Iron is present in our bodies in the exceedingly minute amount of 0.006%. There are many trace elements that are absolutely crucial to numerous biological processes in living beings, which are composed of primarily the same elements but in slightly varying proportions.

The origin of these trace essential elements is spectacular. Heavy elements such as cobalt, nickel, copper, and molybdenum were created when super-massive early stars, 8 to 15 times the mass of our sun, exploded at the end of their lives and spewed out these heavy elements.



The elements according to relative abundance. Copyright: 1970 Wm. F. Sheehan, *A Periodic Chart*. University of Santa Clara, CA, Ref. Chemistry. Vol.49, No.3. p 17-18, 1976

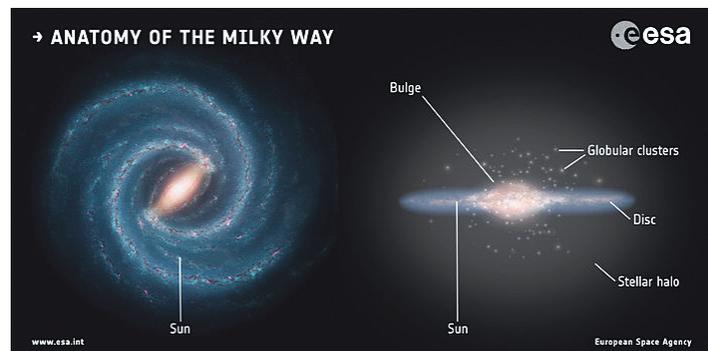
These were created when they fused together in the last moments of the star's life in a process known as nucleosynthesis. As a reference to how massive these early stars were, 1.3 million earths would fit inside the sun. These first stars coalesced and ignited in the early years of the universe. Their destruction in supernova explosions a few million years later seeded the universe with the heavy metals that allowed our star and planet to form.

Our sun, indeed our solar system, is metal rich, so it is likely that our star is a second or perhaps third-generation star. This means that one, possibly two or more super-massive stars, died in succession within our star's vicinity to provide the raw elements of our existence. Our star was formed from recycled star material.

Recycling of matter is pervasive in the universe. The elements on earth presently are all that there ever will be. Aside from the rare larger meteors and thousands of tiny cosmic rocks that enter our atmosphere annually, Earth is a closed system. The earth does not ex-

Continued on next page

change matter with any other cosmic body. We can consider ourselves astronauts traveling around the Sun at 67,000 mph and simultaneously around the center of the Milky Way Galaxy at 515,000 mph on Spaceship Earth.



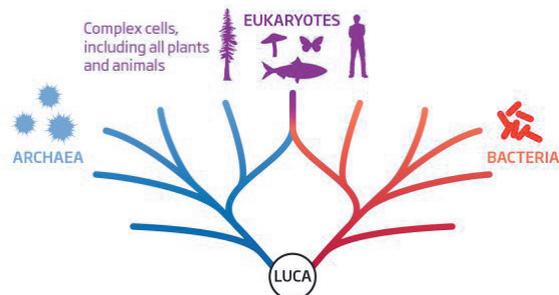
*Sun's position in the Milky Way
Left: NASA/JPL-Caltech; right: ESA; layout:
ESA/ATG medialab*

Another way that we are connected to the deep past as well as to the distant future is that every molecule that makes up you and me were in other things before—perhaps a carbon molecule in the tip of your nose was in one of the earliest rocks from earth's primordial crust 4.28 billion years ago; or from the first fish from the Cambrian Period, 530 million years ago (hereon abbreviated to mya); or in a petal of the first flowering plant 100 mya; or in a fingernail of *Homo erectus* 1 mya; or the hair of a Montaukett native 400 years ago. We are recycled beings whose molecules will form other things when we die, on and on until the end of the universe billions of years from now—perhaps even forming alien beings of another star when our sun dies in seven billion years.

We also share surprising amounts of DNA with every living being—that is to say the six kingdoms of life as we currently understand them: plants, animals, fungus, protists, eubacteria, and archaeobacteria. The last universal common ancestor, known as LUCA or the microbial Eve, lived 4 billion years ago, bearing in mind that the earth is only 4.5 billion years old. LUCA was an organism that lived in the blistering heat of hydrothermal vents of deep-ocean volcanoes. The wonderful weird multiplicity of life descended from this heat-and-sulfur-loving extremophile.

Meet your maker

We're getting closer to understanding what the last universal common ancestor of all life on Earth, LUCA, was like and where it lived



LUCA newscientist.com/Michael Le Page

We share DNA with every other living being on this planet. With some, like chimpanzees, from whom we are virtually indistinguishable, we share 99% of our DNA; with others like bacteria, from which we feel impossibly distant, we share a surprising 7%. Other fun creatures whose DNA we share are: zebrafish 85%, fruit fly 36%,

round worms 21%, mustard grass 15%. Makes you think the next time you eat a salad.

That we are connected in numerous ways is grounded in scientific research and widely accepted physical facts:

1. All living beings require the same elements that came from the same source.
2. Our molecules have been recycled from living and nonliving things and will continue to be recycled.
3. We all descended from one ancient microbe.
4. We share DNA with all of life on earth.

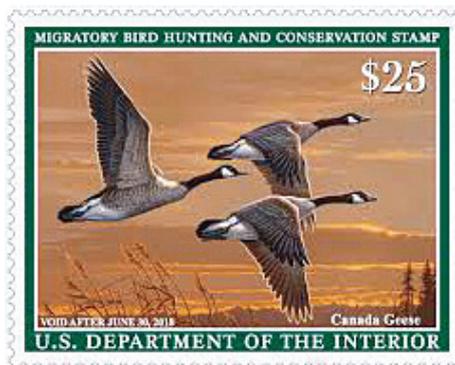
We are connected in other ways that you may explore on your own; for instance, as forensic experts know, we leave traces of ourselves everywhere we go and pick up traces of others wherever we go.

We, animate and inanimate, are part of a great cosmic chain of links stretching into the deep past and far future. We are connected to everything—to a pebble on the beach, even to the driver of the car in front of you. Our feeling of separation is an illusion of the mind. How would the world be if we were to live our lives always aware of our connection and dependence to and on other humans, animals, plants, rocks, air, sea, and sky?

Judy Rall has been living in the East End and visiting SoFo since her son was born 13 years ago. She has been inspired to explore the origin of life, earth, and stars by the curiosity of her son and the abundant natural beauty of the South Fork. Her scientific explorations inspire her artwork and keep her grounded in the turmoil of the present.

Footnotes
on Nature

You Can Now Purchase *The Federal Migratory Bird Hunting & Conservation Stamp (The Duck Stamp)* at the SoFo Gift Shop



SoFo urges you to buy this \$25 stamp if you are a birder, a nature enthusiast, or someone who cares about the environment. The proceeds of the stamp work to safeguard the health and beauty of our natural world. None of the money from the purchase of the stamp goes to SoFo—we are simply one of the offering parties.

What is The Duck Stamp?

The Duck Stamp was conceived in 1934, when Congress passed and President Franklin D. Roosevelt signed the Migratory Bird Hunting Stamp Act (later amended to the Migratory Bird Hunting and Conservation Act).

In addition to being the only conservation revenue stamp, the Federal Duck Stamp is also unique in the way the stamp is created. Each year, the U.S. Fish & Wildlife Service holds an art contest, the only

Continued after calendar

South Fork Natural History Museum (SoFo) Calendar At A Glance Winter 2018

377 Bridgehampton/Sag Harbor Turnpike

P.O. Box 455

Bridgehampton, NY 11932-0455

www.sofo.org email: sofo@hamptons.com

Find us on Facebook  Twitter  Instagram 



A full description of each program is listed on the SoFo website:

www.sofo.org/calendar

January, & February, March

Museum Admission & Program Information

SoFo Members

Admission to the Museum is free. Programs are free unless otherwise specified.

Advance reservations are required for all programs.

Non-Members

Museum Admission Only – Adults \$10, Children \$7.50 (Ages 3-12),
Ages 2 & under free

Museum Admission & Program – Adults \$15, Children \$10 (Ages 3-12),
Ages 2 & under free

Advance reservations are required for all programs.

To make reservations and find out about meeting places, please call SoFo at 631.537.9735
or email to sofo@hamptons.com.



Eastern Tiger Salamander

Salamanders on the Move!

Late winter—the end of February and the beginning and middle of March—when the ice in our ponds begins to melt, three of our native salamanders move out at night from their insulating borrows where they've spent the freezing winter and wiggle into our vernal ponds to breed. Learn about these fascinating and important amphibians in five special SoFo salamander programs:

Conservation of the Eastern Tiger Salamander
(40 minute video presentation)
Saturday, February 17th – 2:00pm

Night time Salamander Walks with "Mr. Salamander"
Andy Sabin, President, SoFo Board of Directors
Especially fun for children as well as adults

Saturday, February 17th – 7:30pm
Eastern Tiger Salamander Search

Saturday, March 3rd – 7:30pm *Blue-spotted Salamander Search*
Saturday, March 10th – 7:30pm *Blue-spotted Salamander Search*

Saturday, March 17th – 8:00pm *Spotted Salamander Search*

For program particulars, please refer to the detailed program descriptions on the SoFo website.

Calendar At A Glance

Key: A-Adults T-Teens C-Children F-Family

A full description of each program and time frame is listed on the SoFo website at www.sofa.org/calendar

Advance reservations are required for all programs.

<i>January</i>	1	• Full Wolf Moon Hike: F •	6:30pm
	6	• Montauk Winter Trail Walk & Wander with CCOM: F •	10am
	7	• All about Owls for Children: C 8+ •	10:30am
	12	• Harbor Seals at Cupsogue Beach – Population Trends and Site Fidelity • Presented by Arthur H. Kopelman, Ph. D., Filmed at 2015 L. I. Natural History Conference: A/T	6pm
	13	• NYSOA Winter Waterfowl Count: A/T •	Dawn-Dusk
	13	• SoFo Cleans the Beach: All Ages •	8am
	13	• Uncovering Elusive Owls: F/C 3-5 •	10:30am
	14	• Searching for Seals & Winter Walk: A/C 8+ •	10:30am
	19	• Astronomy Night—Night Sky Viewing at SoFo: F •	6pm
	20	• Introduction to Amphibians and Frog Dissection: A/C 8+ •	10:30am
	21	• SoFo Stories: Wintertime in Vineyard Field: C 3-5 •	10:30am
	21	• Winter Wonderland Paint & Sip for Kids: C 10+ •	1pm
	27	• Marine Debris or Does it Belong in the Sea? F •	10:30am
	28	• Leaf Study and Craft Workshop: C 3-7 •	10:30am
	31	• Full Blue Moon Hike: F •	6:30pm

<i>February</i>	3	• Birding with Frank—Shinnecock Specialties: A/T •	10am
	3	• Octopus Escapes Again Storytime & Activity: C5+ •	10:30am
	4	• Fashion-a-Fish: F •	10:30am
	9	• Astronomy Night—Night Sky Viewing at SoFo: F	6pm
	10	• SoFo Cleans the Beach: All Ages •	8am
	10	• Beginner Winter Water Birds at Mecox Bay: A/C6+ •	10am
	11	• Searching for Seals & Winter Walk: A/C 8+ •	11am
	11	• Animal Tracks & Craft: F •	2pm
	16	• Nighttime Owl Prowl with Joe Giunta: A •	7pm
	17	• Conservation of the Eastern Tiger Salamander on Long Island • Presented by Valorie Titus, Wildlife Conservation Society, Filmed at 2013 L. I. Natural History Conference: A/T	2pm
	17	• Eastern Tiger Salamander Search with Andy: A/C 6+ •	7:30pm
	19-23	Winter School Recess Programs	10:30am-11:30am
		SoFo Walks in Vineyard Field for Children of All Ages	
		19 • Monday: Birding in Vineyard Field with Taylor	
		20 • Tuesday: Sleeping Trees & Wandering Seeds with Xylia	
		21 • Wednesday: Sleepy Spiders and other Snug Bugs with Melanie	
		22 • Thursday: Snow Clues with Ashley	
	23 • Friday: Winter Weather with Eleni		
24	• Birding with Frank—Winter Sea Ducks: A/T •	9am	
25	• Feeding Time at the Museum—Who Eats Who?: C3-5 •	10:30am	

A full description of each program and time frame is listed on the SoFo website at www.sofa.org/calendar

Advance reservations are required for all programs

March

- | | | |
|----|---|---------|
| 1 | • Full Worm Moon Hike: F • | 7:30pm |
| 3 | • Children's Nature Scavenger Hunt: F/C3-5 • | 10:30am |
| 3 | • <i>Wicked Neat: the Natural History of Vernal Pools</i> •
Presented by Matthew R. Burne, Conservation Director, Walden Woods
Project, Filmed at 2017 L.I. Natural History Conference: A/T | 2pm |
| 3 | • Searching for Seals & Winter Walk: A/C8+ • | 2:30pm |
| 3 | • Blue-spotted Salamander Search with Andy: F/C6+ • | 7:30pm |
| 4 | • Feeding Time at the Museum—Who Eats Who?: C6-8 • | 10:30am |
| 10 | • SoFo Cleans the Beach: All Ages • | 8am |
| 10 | • Feeding Time at the Museum—Who Eats Who?: C9-12 • | 10:30am |
| 10 | • Another Blue-spotted Salamander Search with Andy: F/C6+ • | 7:30pm |
| 11 | • Winter Frogs: Where did they all go? Craft & Treat: F • | 10:30am |
| 16 | • Astronomy Night—Night Sky Viewing at SoFo: F • | 7pm |
| 17 | • Learn How to Feed the Purple Martins! F/C6+ • | 10am |
| 17 | • Spotted Salamander Search with Andy: F/C6+ • | 8pm |
| 18 | • COME DRAW WITH US! Nature Drawing for Beginners: A/T • | 10am |
| 18 | • Star Constellations—A Guessing Game & Workshop: C6+ • | 10:30am |
| 24 | • Sagg Swamp Adventure —Stories from Trees—Scavenger Hunt: F • | 10am |
| 24 | • Birding with Frank—Pond & Bay Waterfowl: A/T • | 10am |
| 24 | • COME DRAW WITH US! Nature Drawing for Beginners: A/T • | 10am |
| 25 | • Hidden Waters: What are Long Island's Aquifers? F/C10+ • | 10:30am |
| 31 | • Full Blue Moon Hike: F • | 7:30pm |

SoFo Young Birders Club

SoFo's Young Birders Club, for birders ages 8 to 18, will meet monthly in January, February & March. The specific dates and times have yet to be determined. For information, please contact the Birding Club Advisor, Frank Quevedo, South Fork Natural History Museum (SoFo) Executive Director, at 631-537-9735 or by email at: sofoexdir@optonline.net

SoFo Book Club**SoFo's Book Discussion Group for Adults**

You are invited to join us for coffee/tea with our book discussion leader, Lisa Kiss, at SoFo's once-a-month discussion group featuring books about nature, science, and environmental issues. Contact Lisa at lisakiss@me.com for book titles, dates and times.





South Fork Natural History Museum & Nature Center

377 Bridgehampton Sag Harbor Turnpike
 PO Box 455 · Bridgehampton · NY 11932
 631-537-9735 Fax: 631-537-9621
 www.sofa.org · info@sofo.org

Membership Form

New Member Renewal Gift Membership Donation

Membership Categories

\$60 Individual \$100 Family \$200 Friend \$350 Supporter
 \$500 Patron \$1,000 Benefactor \$5,000 Founder Other _____

Business Circle Categories

\$100 Library \$1,000 Advocate \$2,500 Supporter \$5,000 Patron

To learn about member categories with benefits, and to join, please go to <http://sofo.org/membership>.

To learn about business circle categories and to join online, please go to <http://sofo.org/membership>

Membership Information

Name _____

Name as you would like it to appear on SoFo materials and in SoFo's Annual Report.

Mailing Address _____

City/Town _____ State _____ Zip _____

Telephone _____ E-mail _____

Please send me:

E-mails about nature walks and programs: Yes No

Digital Newsletter/Calendar (need e-mail address): Yes No

Please make your check payable to SoFo.

Please charge my credit card: Visa Master Card Amer. Express Discover
 # _____

Exp. Date _____ Security Code _____ Billing Zip Code _____
(last 3 numbers on back of card or 4 on front of AmEx)

This is a Gift Membership from:

Name _____

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City/Town _____ State _____ Zip _____

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The South Fork Natural History Museum & Nature Center (SoFo) is a 501(c)(3), non-profit, environmental education organization chartered by the New York State Department of Education. Your membership/donation is tax-deductible to the fullest extent allowed by law.

Footnotes *on* Nature

juried art competition sponsored by the Federal Government. Any artist 18 years or older may enter, and the winning artist sees his or her work featured as the design on the following year's Federal Duck Stamp.

What does The Duck Stamp do?

The Duck Stamp provides one of the easiest things that anyone can do to support bird habitat conservation.

As a federal conservation revenue stamp, 98 percent of the purchase price goes directly to help acquire and protect wetland habitat and purchase conservation easements for the National Wildlife Refuge System. Wetlands acquired with Duck Stamp dollars help purify water, aid in flood control, reduce soil erosion and sedimentation, and enhance outdoor recreation opportunities.

Why Should I Purchase a Duck Stamp Now?

- The stamp serves as a conservation tool.
- The stamp is a free pass into any national wildlife refuge that charges an entry fee from October through June. (SoFo has these stamps for sale every year.)
- Because nearly all of the proceeds are used to conserve habitat for birds and other wildlife, birders, nature photographers, and other outdoor enthusiasts buy Duck Stamps to help ensure that they can always see wildlife at their favorite outdoors spots.
- Federal Duck Stamps are miniature works of art, and they are prized by stamp collectors around the world.



All information about the Duck Stamp is from the U.S. Fish & Wildlife Service, Migratory Bird Program - Conserving America's Birds website. If you are interested in additional information please visit: <https://www.fws.gov/birds/get-involved/duck-stamp.php>

SoFo news

Eric Salzman (1933-2017), *SoFo Executive Board Member*



It is with great sadness, that we inform you of the passing of Eric Salzman, a long-time Executive Board Member of the South Fork Natural History Museum (SoFo). Eric was particularly known at SoFo for his unique birding programs. With his excellent musician's ear, he led numerous "Birding by Ear" walks for the Museum and had a loyal following among our SoFo members.

As an accomplished and dedicated birder, you would often find Eric out in the field birding with members of the Eastern Long Island Audubon Society or traveling to far-off birding sites with his wife, Lorna, also a serious birder as well as a well-known environmentalist and activist. Eric regularly shared his birding peregrinations and sightings with a broad audience in his frequent email birding reports.

Continued on back page

SoFo news

SoFo's 3rd Annual Climate Change Conversation & Reception, September 23, 2017 *by Diana Aceti, Director of Development*

We would like to send a very special thank you to our guests and supporters who helped make our *Third Annual Climate Change Conversation: An Update* such an informative, enjoyable and noteworthy event. Attended by over 100 people committed to exploring ways to preserve our environment, the day included an inspiring panel discussion led by leading Environmental Experts including:

PETER BOYD, Founder & CEO Time4Good, Executive Fellow at Yale University's Center for Business and the Environment

DR. GERRY CURATOLA, Cosmetic Dentist, Founder of Rejuvenation Dentistry, Associate Professor at New York University, and Author

STEVEN ENGLEBRIGHT, New York State Assembly member for the 4th District, SoFo Board Trustee

BRIDGET FLEMING, Suffolk County Legislator representing the Second Legislative District

MICHAEL B. GERRARD, Andrew Sabin Professor of Professional Practice at Columbia Law School and Director of the Sabin Center for Climate Change Law

ROD RICHARDSON, President, Grace Richardson Fund, and Clean Tax Cuts Working Group Co-Founder

FRED W. THIELE, Jr., New York State Assemblyman representing New York State's 1st District; Moderator

TAMSON YEH, Turf and Land Management Specialist, Cornell Cooperative Extension of Suffolk County, and Author

We were very pleased to show *The Arctic Melt* video by acclaimed environmental Fine Art Photographer Diane Tuft during the reception, which included a raw bar and wine. We send a special note of appreciation to our SPONSORS Dan's Hamptons Media and East End Entertainment. We look forward to seeing all of you at next year's 4th Annual Climate Change Conversation & Reception!



Andy Sabin and the Climate Change Advisors



Finny Dianora-Brondal asks how children can make a difference in Climate Change



Climate Change Panel at SoFo

Photos by: Xylia Serafy

A crowd of over 100 people enjoy the Climate Change panel discussion.

SoFo news

But Eric was even more prominent in the music world. He was internationally known as a composer, music scholar, author, impresario, music critic, record producer, and, as one of the founders of the new music theater. His work involved new vocal techniques and electronic extensions, pluralistic styles and forms, as well as new media technologies. For a complete description of his extensive musical accomplishments, please visit his website: www.ericssalzman.com.

Eric divided his time between Brooklyn Heights, NY, and East Quogue, LI. He is survived by Lorna Salzman, his wife of 62 years, and two daughters, poet and author Eva Salzman and composer, lyricist, and songwriter Stephanie Salzman.

Eric generously gave of his time to SoFo. He will be greatly missed by the board, staff, and members of the South Fork Natural History Museum.

**South Fork
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History
Museum
(SoFo)
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Museum (SoFo)

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