

STEM Society Meeting, September 8, 2015

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Last Edit: 10/2/2015

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1 About the STEM Society and the STEM Society Website

STEM is an abbreviation for Science, Technology, Engineering and Mathematics. The acronym STEM is commonly associated with K-12 education, but our use of the term is only slightly bound to this meaning. There are over one hundred people on the mailing list, although a much smaller group attends any one meeting. We meet on the second Tuesday of each month at the Trailside Center at 99th and Holmes in Kansas City, Missouri. The meetings are open to all. The start time is 6PM. We make presentations, have discussions, and have demonstration experiments. These relate to Science, the History of Science, Mathematics, Engineering, Philosophy and Technology at all levels. The topics have ranged from a technical discussion of the mathematics of General Relativity to scientific experiments for young students.

These meeting notes contain links to many other documents, which may be viewed or downloaded by clicking the link. A partial list of documents can be reached by clicking the heading **Documents**. The meeting notes may also be viewed in an archive file (archive.pdf), which is in the list of documents. Many of the documents are PDF files. They may be viewed or downloaded to the computer by clicking, provided Adobe Reader, or another program capable of reading PDF files, is present. There are many more documents available at the site than are listed under **Documents** because the documents.htm file is not at all up to date. The last time I checked, about March 2014, there were about 350 document files on the site. We are in the process of creating better techniques for finding documents and authors. The first meeting of the STEM Society was in November of 2006. For several years we used the content management program called Joomla. It had a fancy looking interface, but was hard to use. It overran the space somehow at our internet provider Bluehost. So we now have a very simple HTML site. It is not so slick looking as Joomla, but is very easy to maintain and modify.

The web site is:

<http://www.stem2.org/>

Direct to the documents list:

<http://www.stem2.org/je/documents.htm>

Direct to the archive file:

<http://www.stem2.org/je/archive.pdf>

2 The September Meeting Announcement

The September meeting of the STEM Society will take place on the second Tuesday of the month, September 8, 2015, at the Trailside Center at 99th and Holmes in Kansas City, Missouri. The starting time is 6PM.

Possible Topics:

(a) There was a program on PBS recently titled **The Mystery of Matter: the Search for the Elements**, which reminded me of a program on NET (National Educational Television, a predecessor to PBS), which was on a long time ago, sometime in the 60's I think. I don't remember the name of it but it captured my imagination at the time. I propose to discuss the content of this PBS TV program. There is also supposed to be a book about it, but a search of local public libraries for the DVD or for the book proved unsuccessful. This is a very good program, not like the mostly crummy NOVA programs of recent years.

(b) There are several interesting books that can be reviewed. I just picked up some good books at Linda Hall Library today. One of them is called **The Volterra Chronicles** by Judith R. Goldstein. She is the wife, if I am not mistaken, of David L Goodstein, the Caltech physicist, who some might remember for his television program and book, **The Mechanical Universe**. I don't know the background of Judith, but I shall look it up. Volterra headed a school of famous Italian mathematicians, many of them Jewish, such as Tullio Levi-Civita, the inventor of Tensor Analysis. The famous female mathematician Sofia Kovalevskaya is pictured in the book, so must bear some relationship to these mathematicians. I will try to read the book over the weekend so that I can discuss it.

(c) Last month I said that we had not heard much about the visit to the Galapagos islands, seen pictures, and discussed the influence on Darwin? This hint worked. And Rick Hines showed up, and was probably prepared to talk about this? However, I forgot about it, and I forgot to ask Rick if he wanted to make a presentation, before we ran out of time. But it would be

nice to hear such a talk at this meeting, wouldn't it?

(d) If time permits, I can also talk about the work I have been doing lately?

(e) As always, I hope attendees choose to bring additional things, ideas, or presentations.

3 Rick Hines: The Autopsy of a Disk Drive

Rick disassembled a hard drive freeing the neodymium rare earth magnets, as well as the fingers and their heads that read the tracks, and the set of magnetically coated extremely flat disks, where the magnetic information is stored. These very strong magnets allow very small coil currents to move the reading and writing heads from magnetic track to magnetic track. The disks can be made of coated nonmagnetic material such as glass or aluminum. Some take such disks apart to greedily salvage the gold from various parts. There are Youtube videos on this topic. But there is quite a bit of work and time involved in this occupation, and so not obviously worth the effort.

4 Rick Hines: 3.5 Million Year Old Coral Fossil from Truman Lake

Rick brought a rock, which he had broken into two pieces, and which contained fossilized coral on its surface. He used hydrochloric acid to dissolve calcium carbonate from one piece of the rock to expose the fossil coral, which is fossilized by silicon dioxide and which is therefore not so much affected by the acid. The coral appears as a tangle of worms growing from the surface of the rock. They are quite fragile and easily broken.

5 Discussion of Energy and Nuclear Reactors, Led by Tom Grant

This discussion was quite lengthy but quite interesting. Those most vigorous participants, as I remember them, were Tom Grant, Kent Smith, Rich

Kaufman, Steve Cummings, Rick Hines, Pat Beesley, and Greg Hodes. It is a bit hard to record such discussions, but I welcome anyone to email their recollections of them to me, and we will place them here. I am sure others deserve to be listed in the credits.

6 Rich Kaufman: Discussion of an Article on the Proposed Iranian Nuclear Arms Deal

This article appeared on Tuesday September 8th, 2015 in the New York Times. The article discusses some technical details that the politicians seem to be oblivious about. I later downloaded the article from the Times website and saved it. Very informative! Go read it and be the star of your local barber shop. The New York Times contains a special section on science each Tuesday.

7 Bob Kessler: K.C., Me, Wen Ho Lee, and Ye

K.C. Edgar Snow was born in Kansas City in 1906,... became a journalist and in 1937 wrote ” **Red Star Over China**” ... was involved in President Nixon’s re-establishment of United States relations with china in 1970 ...

E. Grey Diamond, M.D., a friend of Edgar Snow, helped established the 6 year **UMKC** School of Medicine program in 1970...and in 1963 published ”**Inside China Today: A Western View**”

Robert M. Farnsworth, Professor of English, Emeritus, at **UMKC**, in 1996 published the book ”**From Vagabond to Journalist: Edgar Snow in Asia 1928-1941**”

Me ... I went to China in **1987** with a People-to-People Computers in Education Delegation...our guide in Beijing was Penny Dong...(the present **UMKC** provost, Dr. Leo Morton, was there in 1987 as well... in a previous job)

Wen Ho Lee... a **Los Alamos Laboratory** physicist, went to China in **1988** to a science conference...he was later falsely accused of spying..and later wrote a book "**My Country Versus Me**"

... **Tiananmen Square event 1989**...

Ye ... Congyang, his wife, daughter and I met August 1, 2015' in Miami, Oklahoma at a motel pool, along with Barbara Kessler, her two sisters, and other family members... and he was heading to his new job at **Lawrence Livermore Laboratory** ... after traveling on to Livermore and meeting Penny Dong via email, she invited his family to Pleasanton, California ...

8 Books:

8.1 **Bob Kessler, Leon Dixon, Review: Study Finds More Classroom Technology Doesn't Mean More Learning**

<https://stateimpact.npr.org/florida/2015/09/15/study-finds-more-classroom-technology-doesnt-mean-more-learning/>

From Leon Dixon:

I'm currently reading a book that address this.

Geek Heresy: Rescuing Social Change From the Cult of Technology, by Kentaro Toyama.

"He is an outspoken critic of the "technological utopianism" that he sees in initiatives such as **One Laptop Per Child**, and argues that technology only magnifies existing human intent and capacity."

8.2 **James Emery Review, The Volterra Chronicles: The Life and Times of an Extraordinary Mathematician 1860-1940**

This book comes from Linda Hall Library, which has many very interesting biographies of scientists. Vito Volterra was an Italian Mathematician, famous

for Integral Equations, for being a father of Functional Analysis, and for being the leader of a group of famous Italian mathematicians and physicists of the late 19th and early 20th centuries. This school of mathematics was largely ended by the rise of the Fascists, and by the second world war.

[/stem2.org/je/volterra.pdf](http://stem2.org/je/volterra.pdf)

9 James Emery Review: The Mystery of Matter: the Search for the Elements

This dramatised television documentary is a history of Chemistry focusing on seven chemists, each playing a role in the discovery of the elements. It was on PBS in September 2015, a wonderful and very educational program, not like the often poor quality NOVA programs of recent years brought to you by the Koch brothers. My extended review can be found on the STEM Society website:

[/stem2.org/je/mysteryofmatter.pdf](http://stem2.org/je/mysteryofmatter.pdf)