

# STEM Society Meeting, August 13, 2013

James Emery

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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.

The set of meeting notes may be viewed by going down the list of notes appearing on the front page of the site. These notes contains links to documents, which may be viewed or downloaded by clicking the link. Other documents can be reached by clicking the heading "Documents and Downloads" that appears on the left side of the front page. Then click on "documents." The meeting notes may also be viewed in an archive file in the list of documents. Most of the documents are PDF files. They may be viewed or downloaded to the computer by clicking, provided Adobe Reader is present, or another program capable of reading PDF files. There are usually more documents available at the site than are listed under "Documents" because they are not in the documents.htm file.

**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>

**Last Months Notes:**

<http://www.stem2.org/je/stemsoc070913.pdf>

## 2 The August Meeting Announcement

The August meeting of the STEM Society will take place on the second Tuesday of the month, August 13, 2013, at the Trailside Center at 99th and Holmes in Kansas City, Missouri. The starting time is 6PM.

A List of Possible Topics:

(1) Tom Grant will give a talk on Nuclear reactors and the Fukushima accident. Tom has a background in Nuclear Energy, Solar Energy, and Wind Energy.

(2) As always, we expect there may be impromptu topics, projects, shows-and-tells, new theorems, experiments, book reports, problems and solutions in mathematics, physics, engineering, biology, scientific biographies, et cetera.

(3) If time permits, a start on the Quantum Mechanics of Semiconductors.

**The STEM Society Website:**

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

## 3 Tom Grant, The History and Status of Nuclear Energy and the Fukushima Accident

Tom gave a very interesting talk touching on many topics. The talk was well received with enthusiastic applause.

I can't really do the talk justice, so I will just list a few rough not quite sentences that I recorded.

(1) Improvements in nuclear reactor technology over time. (2) First use of nuclear reactors: Navy Submarines: Hyman Rickover. (3) Connecticut Yankee Reactor controversy. (4) Reactor accidents: Three Mile Island, Chernobyl, Fukushima. (5) Types of Fuel. (6) Encapsulation of fuel. (7) Nuclear waste problem exaggerated, (8) China proposed reactors. (9) Reactors at hospitals and universities. (10) Unique reactor at University of Missouri Columbia, only remaining type. (11) Air cooled reactors, (12) Electrical transmission lines air cooled, but buried lines have a limited ability to cool. (13) Weapons reactors. (14) Wind Energy: The vast improvements in wind

turbines are due to the digital control electronics, and economic wind turbines would not be possible without these controls. (14) Problem of wind turbines is the need for very expensive electrical transmission networks. (15) Tom without thinking, had submitted to a perhaps unnecessary medical CAT scan. Later he realized that that CAT scan had exposed him to more radiation than he received in 30 or forty years in the nuclear reactor industry.

This talk lasted about 2 hours, and there was much much more to it than the above notes indicate. Tom is a proponent of nuclear energy, although he now works on various alternative energy sources. He thinks that under current conditions the outlook for nuclear reactor construction is not good because of the mood of the country, because of the fear of accidents, and because of the lack of available capital needed to build them. He does believe that nuclear reactors have been very economically successful and have supplied very much cheap energy, with the value of the energy produced far exceeding the construction and operating costs.

China does have proposals to build several new reactors. Some of the members of the audience expressed an implied disapproval of nuclear energy, and there were many questions expressing skepticism, but the discussions were polite and friendly.

## 4 Bob Kessler, Book Discussion

Genome related books...

1. "The Language of God", Francis S. Collins...2006...p.305
2. "A Life Decoded: My Genome: My Life", Craig Venter, 2007, p.390
3. "The Bonobo and the Atheist: In Search of Humanism Among the Primates", Frans de Waal 2013 p.289
4. "The Moral Landscape: How Science Can Determine Human Values", Sam Harris, 2010, p.291
5. "Genome: The Autobiography of a Species in 23 Chapters", Matt Ridley...2000...p.344
6. "Biology is Technology: the promise, peril, and new business of engineering life", Robert H. Carlson...2010...p.279
7. "Welcome to the Genome: A User's Guide to the Genetic Past, Present, and Future", Rob DeSalle and Michael Yudell...2005...p.215
8. "The Human Genome: A User's Guide", Julia E. Richards and R. Scott Hawley...third edition, 2011...p.585

9. "Frans de Waal's new book carries the important message that human kindness is a biological feature of our species and not something that has to be imposed on us by religious teaching." Desmond Morris

Bob Kessler, 8-10-13

## **5 Rich Kaufman, Natural Gas Fracking**

Did not get to this.

## **6 Cris Sanderson, Immanuel Kant**

Did not get to this.

## **7 Steve Cummings, A Peltier Cooling Device**

Problem: troubleshoot this nonworking device.

## **8 James Emery, Quantum Mechanics and Semiconductors**

Did not get to this topic.

## **9 Email**

Tom,

So, regarding your talk at our Stem Meeting next Tuesday August 13, 6Pm Trailside Center, I assume that It will be about about the future of nuclear power post Fukushima, and maybe about solar energy and energy in general. Is that right?

Jim Emery 816-444-7895 cell 816-3776133

The talk is specific to nuclear and the Fukushima accident. I can cover other energy items in later talks.

Tom

Sent from my iPhone

On Aug 7, 2013, at 10:14 AM, jim emery jjdemery1@yahoo.com, wrote:

## 10 Kessler book update 8-14-13

Genome related books

1. The Bonobo and the Atheist: In Search of Humanism Among the Primates\*, Frans de Waap.2892013
2. The Human Genome: A Users Guide, Julia E. Richards and R. Scott Hawleythird edition, p.5852011
3. Biology is Technology: the promise, peril, and new business of engineering life, Robert H. Carlsonp.2792010
4. The Moral Landscape: How Science Can Determine Human Values, Sam Harrisp.2912010
5. A Life Decoded: My Genome: My Life, J. Craig Venterp.3902007
6. The Language of God, Francis S. Collinsp.3052006
7. Welcome to the Genome: A Users Guide to the Genetic Past, Present, and Future, Rob DeSalle and Michael Yudellp.2152005
8. Genome: The Autobiography of a Species in 23 Chapters, Matt Ridleypp.3442000

\* Frans de Waals new book carries the important message that human kindness is a biological feature of our species and not something that has to be imposed on us by religious teaching. Desmond Morris

Bob Kessler, 8-14-13

## 11 Bob Kessler, Notes on the Cerner Presentation of 8/12/13

To Mark Drury jmark.drury@nnsa.doe.gov

Mark,

Below are my notes from the SKCA meeting Cerner presentation Monday.

Maybe, in February, the name of the Tech Transfer Building could be changed to "STEM Education" building and give Cerner, UMKC, Center School District, Mid-Continent Library, Burns and McDonnell, and others an opportunity to visit the site?

CAP members would probably go for that...

Thoughts?

Enjoy, Bob

Cerner Presentation

The Cerner presentation at the South Kansas City Alliance meeting Monday night (8-12-13) on the subject of the land purchase and planning of a Cerner 2.2 billion dollar office park at what used to be the Bannister Mall was quite interesting. The office buildings would support Cerner's plans for the addition of 1200 to 1400 additional employee per year over the next 10 years..

The plan would include 4.4 million sq. ft., including 3.7 million sq. ft. office buildings, 400,000 sq. ft. retail, and 300,000 sq. ft. ancilliary buildings. The office park would provide for the addition of 12,000 to 14,000 employees in the next ten years. Planning indicates a decision to buy (or not) would occur on December 27...development would take 6 to 9 months...and initial occupancy would occur at the end of 2015 or early 2016.

The present Cerner office park North of the Missouri River is 1.1 million sq. ft. The present Cerner Innovation Center at the close- by Marion site houses 2800 employees in 5 buildings and is esentially full. Cerner also has 2 buildings (one in construction) at the Legions'.

The importance of STEM education was mentioned.

Stay amused! Bob

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