

STEM Society Meeting, May 13, 2014

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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 which is 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 the documents.htm file is not necessarily kept up to date.

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 May Meeting Announcement

The May meeting of the STEM Society will take place on the second Tuesday of the month, May 13, 2014, at the Trailside Center at 99th and Holmes in Kansas City, Missouri. The starting time is 6PM.

Possible topics could be:

- (1) Solar Radiation and Solar Energy.
- (2) Scientific Computing With the Raspberry Pi.
- (3) An Introduction to Cryptography.

(4) Book report, "Tuxedo Park" by Jennet Conant, and possibly other books.

(5) The pH meter, glass electrodes, and the Nernst Equation of Physical Chemistry.

(6) Surprise Projects and Topics.

The STEM Society Website:

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

3 Cécile Lagandré: Solar Radiation on a Hill Surface and the Affect on Plant Growth

Cécile gave a power point presentation on her Excel calculations and graphs.
A link will be placed here.

4 Jim Emery: Solar Radiation on A Plane, Formula Derivation, Analysis, and Programs

I gave a brief oral explanation of the derivation technique for the tilt equation.
See the following for details:

stem2.org/je/solarrad.pdf

5 Jim Emery: Scientific Computing and the Raspberry Pi

We gave a demonstration of the the Raspberry Pi computer. Although I was able to connect the display directly to the projector, the projector displayed the image as as a wide screen, whereas the projector is designed for a traditional display size. As a consequence the display only filed about the middle third vertically, making the pring quite small. So I used a flat screen monitor with a DVI connection. A HDMI display from the Raspberry Pi is

converted to DVI, with a low cost converter. This produces a nice display on the monitor.

For details see

stem2.org/je/raspberrypi.pdf

6 pH Meter

We gave a brief demonstration and explanation of the operation of a pH meter that uses a glass electrode.