

STEM Society Meeting, January 10, 2012

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1 About the STEM Society and the STEM Society Website

STEM is an abbreviation for Science, Technology, Engineering and Mathematics. There are about 60 people on the mailing list, although usually 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 sometimes have scientific demonstrations. The topics range from General Relativity to scientific experiments for kids.

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 often more documents available at the site than are listed under "Documents" because they may not have been added to the documents.htm file yet.

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 January Meeting Announcement

Our meetings are held on the second Tuesday of the month, normally at the Trailside Center at 99th and Holmes. However, this month is a rare exception and we are meeting at the Southwest High School planetarium. The meeting

will start as usual at 6PM. Southwest High School is at 6512 Wornall Road in Kansas City, Missouri. Parking is to the west of the building. To get to the parking lot turn west from Wornall road onto 66th Terrace. The planetarium is a modern addition at the southeast corner of the building. To enter walk from the parking lot along the south side of the building to doors located on the south side and toward the front.

We will see the remodelled planetarium and have discussion on long distance learning of science on the internet, and a planetarium show. The meeting will be hosted by Craig Nulan, Tom Brenneman, and Dave Anstaett of the Kansas City Missouri School system. Tom Brenneman was formally with the Blue Valley CAPS project as I understand. So we will also discuss the possibility of a CAPS East project in Missouri.

Associate Professor John Hoopes, an Archaeologist in the department of Anthropology at the University of Kansas has been invited and may speak also. His research areas are: Archaeology, Human Ecology, Ceramic Analysis, Digital and Internet Applications; and the regions of Southern Central America, Mesoamerica, and South America.

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Because we will be in a planetarium, time permitting, I will deliver a little talk on Kepler's laws of planetary motion, and the mathematical method Kepler used to compute the elliptical planetary orbits.

We will also present a brief overview of the kinds of topics we present at our stem society meetings. Recall that last month we had a talk on Parkinson's disease and an overview of the nervous system. There were other topics that were introduced briefly, and which we did not deal with very well, and so deserve more devotion. As I recall some of these were wind power, and the character of our electrical power system, specifically concerning the role that grounding plays. Unfortunately, I have not yet put up on stem2.org the notes for the last meeting, but I shall do that, probably later today.

3 Dave Anstaett and the Long Distance Learning Labs

Dave Anstaett is a long time teacher of English and Literature. He has taught in high schools, community colleges and and universities. He was at

UMKC for a long time and taught televised courses on the local learning channel managed by UMKC on Time-Warner Cablevision. For the last two years he has been with the Kansas City Public schools managing the Long Distance Learning activity. Currently they have six Long Distance Learning Labs with the latest technology, with two-way interaction with students. A teacher has the ability to focus a camera on individual students. Dave claims that this type of teaching is very effective. He told us that "just yesterday we made a connection between students at Border Star School on Wornall Road and Brookside, and students at a school in Australia." They do this sort of thing routinely.

4 Tom Brenneman

Tom is the manager for networking at the school district. He had this sort of job at UMKC, and created the networking for the Blue Valley CAPS project.

Tom gave us an introduction to the planetarium and its history, and the struggle to restore it, and future plans for it. It seats 46 people and it is intended that all students in the school district will eventually have an opportunity to see a presentation at the planetarium. Also it is planned that it will also be made available to students in other school districts, lastly the public will have access also. The details of this have not been worked out. They are looking for a person with an astronomy background to run the planetarium. There will be a grand opening the 29th of January, 2012. Tom ran the projector for the demonstration.

5 Introduction to the New Planetarium by Craig Nulan

"It would honestly be an understatement to call it a planetarium anymore though it leverages the domed ceiling to produce a truly unique set of sensory effects. It is the second of its kind installation in the U.S., and will become a showpiece and destination point for many school districts across the city when it comes fully online next year. While there, we would also like to show you one of our distance learning labs and briefly explain the why and how of these facilities use both to leverage scarce exceptional teaching resources, and, as a lynchpin content source for our one-to-one endpoint initiative.

This field trip would afford you an opportunity to get better acquainted with my boss Tom Brenneman (who is with no exaggeration on my part, the most qualified, astute, and visionary superior I've had in 27 years of IT service work) and our Instructional Technology Manager Dave Anstaett who is the driving force behind expert instruction in the distance learning environment. Dave has been a teacher for 43 years and is one of the most highly regarded creative writing and English teachers in the U.S. I have been truly blessed to be associated with these two gentlemen. Our collaboration is yielding tremendous results, that are to a great extent overshadowed by the political follies swirling around the District at this time.

I believe that making introductions given many of our shared objectives might be one of the most effective means available to us of catalyzing additional highly focused effort to accomplish the aims of the CAPS-East initiative. Tom Brenneman built the entire IT infrastructure on which CAPS depends before coming to undertake the profound challenges of IT in the Kansas City Public Schools earlier this year. I see would love to see Tom playing a role in this proposed development at the Bannister Federal Complex below, as well - and I think it only makes sense that the CAPS-East team leverage his detailed knowledge and experience of costs, lessons-learned, etc - from the original CAPS installation in Blue Valley. I see all of this coming together in helping to foster and promote a Smart Community.

In any event, I promise you a most enjoyable experience in the planetarium at SWECC, and I hope that you will be amenable to this offer. When I hear back from you, I'll get the ball rolling on my side to make arrangements to make it so. What I envision for the evening's program will be a Distance Learning Lab demo and talk by Dave Anstaett on his experiences with Distance Learning and one-to-one computing - over the course of his career which is nearly as long as I've been alive - Dave has worked with all strata of students, but for the last several years with the most challenging students of all - and I think his insights are little known, eye-opening, and quite profound. We'll wind up the evening with a show or two in the planetarium and some casual discussion."

6 The Southwest High School Planetarium

The planetarium has a new digital projector, which produces very detailed and spectacular images on the domed ceiling of the planetarium. The plan-

etarium had been decommissioned a few years ago and had been used as a store room and received quite a bit of hard treatment and damage during that time. It has been remodelled with a new projector, the old one is now in a school in Colorado. This new projector is made by the Spitz company, a company created by Armand Spitz (July 7, 1904–April 14, 1971) of Philadelphia. He was a famous planetarium designer.

www.spitzinc.com

The new projector is a Spitz SCI Dome XD. A special lens had to be fabricated to project to the existing domed ceiling. Spitz personnel came to Kansas City and measured the planetarium and the dome. The projection is very bright and spectacular. The astronomy software is the package called Starry Night.

Spitz supplies special videos called "Trips" which are projected onto the spherical dome. These can be videos on any subject. They are very spectacular, and give a feeling of being in the middle of the action. There were Trips into outer space viewing astronauts, under the ocean seeing fish and sea creatures, a video on telescopes, the African Serengeti Plains and so on. Apparently there is software for making these Trips from flat videos. If the technology is accessible, one could maybe create interesting demos of mathematics, physics, map projections and so on.

Special movies called **Video Trips**.

Planetarium software called Starry Night.

7 Armand Spitz and His Planetariums

From Wikipedia:

"Armand Neustadter Spitz (July 7, 1904–April 14, 1971) was a planetarium designer.

Armand Spitz, the son of Louis Spitz and Rose (Neustadter), was born in Philadelphia, Pennsylvania and was educated at the University of Pennsylvania and the University of Cincinnati, without receiving a degree from either. In 1926 he began working as a journalist, and within two years purchased a newspaper in Haverford, Pennsylvania. This went bankrupt in 1934, and Spitz traveled to France, discovering an interest in astronomy on the voyage to Europe. On his return to the United States, he became a lecturer on

astronomical topics at Haverford College. As a side effort he made a 1-foot-diameter (0.30 m) papier-mache model of the Moon, which is on display to this day at the Academy of Natural Sciences in Philadelphia.

Spitz became a volunteer at the new Fels Planetarium in Philadelphia, doing publicity, but soon was allowed to do planetarium lectures. He also created a series of radio programs in which he covered scientific topics, with an emphasis on astronomy. His first book, *The Pinpoint Planetarium*, appeared in 1940. The first half of the book described the sky and legends attached to it. The last half of the book contained star charts to be punched out and held in front of lamps, projecting stars in their proper relationships onto a wall or other smooth clear surface. Spitz dodecahedron planetarium projector.

Concerned that the only planetariums then available were so expensive that few institutions could have them and few people would live near enough to visit, in 1947 Spitz completed design work on a very inexpensive planetarium model. The main problem, he discovered, was that creating a globe for stellar projection was very complex and expensive. Following a suggestion by Albert Einstein, Spitz used a dodecahedron as the "globe" equivalent for his star projector.

Following a demonstration at an astronomical conference at the Harvard-Smithsonian Center for Astrophysics, Spitz received considerable publicity, and began marketing his Model A planetarium for 500 dollars. These were sold to the various American military academies, small museums, schools, and even to King Farouk of Egypt.

Within a few years, Spitz introduced the model A-1, which incorporated the Sun, Moon, and five naked eye planets, still using the dodecahedron shape for the star projector. Later a model A-2 came out, projecting more stars (the model A only gave stars brighter than magnitude 4.3). Just at the time that Sputnik caused the United States government to provide considerably enhanced funding for science education, Spitz produced his model A3P. This had a spherical star projector, and mechanized motions for the Sun, Moon and planets, and lunar phases. Well over a thousand of this model were ultimately sold, and in fact, when the Spitz company stopped making this model for a few years, had to bring it back due to continuing demand. Spitz had his company developing the Space Transit Planetarium, a model with additional motion capabilities and more stars, when he suffered the first of a series of strokes in 1967. He went into semi-retirement after this. Spitz died in Fairfax, Virginia."

8 The Technology of the Spitz Planetarium Projector

I did a brief search of the Spitz Company website www.spitzinc.com, looking for technical details of the Spitz SCI Dome XD. I did not find much, but one of their claims is that the borders of the projection segments are mapped seamlessly so that the boundaries of the individual image segments projected to the spherical dome are not visible. So apparently this modern digital very bright projector does use a projecting technique that bears some relationship to the original Spitz projection method. **Spitz dodecahedron planetarium projector.**

9 Map Projections: The Mapping of the Spherical Earth to A Plane Map, and the Inverse

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

10 Long Distance Learning

Kansas City Public schools uses **Cisco ITbase**. They have communicated with Australia with students from Border Star School elementary school. Dave Anstaett, a veteran English literature teacher, has taught at the High School, Community College, and University levels, and is well known for his UMKC programs taught on the Time-Warner public access channel, channel 19, and so on.

11 John Hoops

Archeologist John Hoops of the KU Anthropology department attended, and informally volunteered to create a program on the Mayan Calender and the end of the world and so on.

John W. Hoopes
Associate Professor
Archaeology

Director Global Indigenous Nations Studies
Ph.D., Harvard 1987

Research Areas: Archaeology, human ecology,
ceramic analysis, digital and Internet applications;
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12 The Kansas City Star

Reporter Joe Robertson,

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of the Kansas City Star attended the meeting and may write a piece on
the planetarium.

Reporter

13 Kepler's Laws of Planetary Motion and Kepler's Orbit Calculation

See the sections on **Conics**, and the sections on **Kepler's Laws** in the
document called Astronomy.

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