

∫ Integram

EMU Mathematical Sciences Department

Spring 2004

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John L. Horst Retires after Teaching 40 years at EMU

John Horst is completing 40 years of service to EMU this spring. He will be remembered not only for his expertise in the classroom, but also in the field of music.

After graduating from EMC in 1960, John taught at EMHS for three years before entering graduate studies in physics at the University of Virginia. He returned to EMC in 1967 to teach college physics and math courses. In 1968, EMC formed a department of physics and offered a physics major until 1978. Robert Lehman served as department chair of physics and John and Joe Mast served as faculty. The brand new Suter Science Center included the M. T. Brackbill Planetarium, operated by the physics faculty. After the major in physics was discontinued, John became the director of the planetarium, and eventually the physics faculty joined the department of mathematical sciences.

John's special interest in music resulted in the creation of the physics of music course. He purchased an Ensoniq VFXsd synthesizer and immediately put his composing skills to work. Recently John created a CD of his synthesizer compositions, available at the EMU Bookstore.

The interdisciplinary studies program (IDS) included a 20th century course that John taught for many years, sharing his knowledge of 20th century music along with new physics. Several years ago John performed in the "Sing Down the Moon" drama presented by EMU Theater.

When John was a college student he sang bass in the Men's quartet for the Mennonite Hour radio program. Recently John produced several CDs of music for Menno Media from the Mennonite Hour archives. All of the Mennonite Hour groups are featured: the Mixed Voice Choir, the Men's Chorus, the Ladies Sextet & the Men's Quartet. (also available at the EMU Bookstore).

In 1989, a program in pre-engineering was initiated and John served as advisor to about 50 students who transferred to various engineering schools. He also taught two engineering courses: Statics and Dynamics.

John will also be remembered for his physics classes and for his sponsorship of the Math Contest. Twelve teams entered the competition, four EMU teams received a meritorious rating and three teams received an honorable

mention.

In summary, it is probably an open question as to whether he was a physicist with a passion for music, or a musician who taught physics as a profession.

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Introducing Leah Shao Boyer

Leah will be joining the department faculty this fall and focusing on physics instruction. She graduated with a B.E.E. degree from Dalian Marine College in China, and also has M.S. and Ph.D. degrees from Bowling Green State University.

Her dissertation topic was “Preparation and Characterization of II-VI Compound Semiconductor Thin-Films by Pulsed Laser Deposition (PLD).”

Leah has experience working as an Associate Engineer in the Advanced Research Group of the Product Development Department at Mogul/Champion Spark Plug.

We extend a warm welcome to Leah as she arrives in Harrisonburg this summer!

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Mathematical Sciences Department News

The primary activity of the department this semester was interviewing and selecting a new department member to teach physics. Four candidates interviewed for the position. Each taught the Physics II class, gave a presentation, and was interviewed by faculty and administration. The four presentations were on thin-film semiconductors, boost phase missile defence, interactive science experiments on the web, and high-energy accelerator physics experiments.

Fairfield Languages Technologies: Bill Carter and recent EMU graduate Dan Stutzman gave a presentation about the company that created and produces the Rosetta Stone language software program that is designed to teach another language. They especially emphasized the types of jobs and the culture of the company and answered student questions about how to best prepare for a future with a technology company.

John Horst presented a lunch seminar at the end of the semester: Happy Vibrations. The seminar featured demonstrations of acoustic phenomena that were used in physics courses. On occasion John has presented this entertaining “Show and Tell” to various high school groups.

Team #603: Jesse Blosser (Mathematics Education), Erik Frankenfield (Pre-engineering), and Weldon Miller (Mathematics); and Team #608: Zachary Kurtz (Mathematics), Lydia Ramer (Mathematics Education), and Gregory Sachs (Mathematics and Computer Science) worked on a discrete mathematics problem. The problem dealt with the use of a Gamma Knife in the treatment of tumor cells in brain tissue. Teams were asked to design a model to provide the fewest and most direct doses in order to treat the tumor without going outside the target tumor itself.

(Please send Alumni News to mastj@emu.edu)

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Problem Corner

Fall problem results:

In our last Integram problem, we asked readers to provide the missing term in the sequence 10, 11, 12, 13, 14, 15, 16, 20, 22, 24, ____, 100, 121, 10000. We had several responders tell us that the missing term was 31, assuming that we had inadvertently left out the number 17 between 16 and 20. This is the solution we intended, and we apologize for the error. Our hope was that readers would recognize that the numbers listed were representations of the decimal 16 in base 16, base 15, base 14, etc. Of course, in the sequence we gave, we left out the base 9 representation. However, we did have one responder who found a solution for the sequence we gave!

Ellis Detwiler, where did you ever come up with the following formula [pictured right]? Ellis has been a regular at solving these Problem Corner problems but this time he outdid everyone.

$$A(n) = \lfloor (14 - n) / 7 \rfloor \times (10^{\lfloor (14-n)/7 \rfloor}) + (n - 1) \times \lfloor (14 - n) / 7 \rfloor + \lfloor n / 8 \rfloor \times \lfloor (20 - n) / 9 \rfloor \times (20 + \lfloor (n - 1) / 8 \rfloor \times 2^{\lfloor (2n-9)/(18-n) \rfloor}) + (\lfloor n / 12 \rfloor \times 10 + \lfloor (n - 1) / 12 \rfloor \times \lfloor (15 - n) / 2 \rfloor)^{\lfloor (14+n)/n \rfloor \times \lfloor (14+n)/4 \rfloor}$$

New Problem: If a certain six-digit number is split into two parts, one constituting the first three digits and the other the last three digits, and the two parts are added and the resulting sum squared, it is found that the product is the original six-digit number. What is the number? [As a bonus, determine the number of solutions, without performing an exhaustive search.]

Submit solutions to Owen Byer: byer@emu.edu

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