HISTORY AND PEDAGOGY OF MATHEMATICS
March 14-15, 2009
MAA Carriage House, 1781 Church Street NW, Washington, DC

Special event: View rare mathematics books at the United States Naval Observatory. **On Friday, March 13 from 4:00 p.m. to 5:30 p.m. interested participants will visit the United States Naval Observatory Library to see selections from their outstanding collection of rare mathematics books. Fred Rickey will coordinate the event with Sally Bosken of the USNO. Those planning to attend this event must submit their names and birthdates in advance and bring a photo ID such as a driver's license or passport. Give the name exactly as it appears on the ID document. Send this information to Fred Rickey at** Frederick.Rickey@usma.edu**.**
Those in doubt about attending should submit their information: There is no penalty for no shows, but those who have not submitted information will not be allowed entry.

Saturday, March 14

8:30 9:00 registration on site

9:00-9:45 a.m. **Janet Heine-Barnett** Colorado State University - Pueblo
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    Boolean Algebra Past and Present: A Two-Valued Approach to Its Teaching
In 1847, George Boole (1832 – 1916) launched the study of boolean algebra with a bold new approach to logic. Axiomatized as an abstract structure in 1904, boolean algebra was later recognized (in 1938) as an important tool in circuit design. We will survey this (hi)story by examining student projects based entirely on original source readings – projects which bring past and present together to provide context and motivation for students as they build their own understanding of boolean algebra and its applications. Information about 20+ similar projects in discrete mathematics developed at CSU-Pueblo and NMSU with NSF support will also be provided.

9:50-10:35 a.m. **Amy Ackerberg-Hastings** University of Maryland University College
`aackerbe@verizon.net`
    John Playfair in the Natural Philosophy Classroom
While textbooks are deservedly considered valuable and interesting primary sources by mathematicians as well as by historians of mathematics education, these materials generally provide little insight into how classes were conducted each day or into what students actually learned. To develop a more complete picture of educational practice, textbooks must be combined with information gleaned from administrative records, student notebooks, student reminiscences, obituaries, and the like. Unearthing that sort of documentation, though, often depends as much on serendipity as on systematic research.

John Playfair (1748-1819) served as professor of mathematics and then of natural philosophy at the University of Edinburgh. In addition to *Elements of Geometry* and *Illustrations of the Huttonian Theory of the Earth*, the books for which he is best known, he organized his lectures into *Outlines of Natural Philosophy* (2 vol., Edinburgh, 1812-1814). There are also at least 5 extant sets of notes taken by students who attended his natural philosophy course. This paper will analyze as many of these notes as possible, focusing especially on the following questions: How closely do the notes conform to each other and to the textbook? Did the material Playfair covered change over time, such as before and after *Outlines* was published or when he revised the textbook in 1816 and 1819? Did the fact that he was primarily a mathematician early in his career inform his choice of topics and the manner in which he presented them? Were there aspects of the course that were uniquely Scottish?

10:45-11:30 a.m. **Betty Mayfield,** Hood College, mayfield@hood.edu

<p align="center">*A Report from SMURCHOM*</p>

In the Spring of 2008, I took two students to the Fourth Smoky Mountain Undergraduate Conference on the History of Mathematics at Western Carolina University. This conference is such a wonderful opportunity for undergraduates, combining a keynote address by a mathematical historian with talks and posters by students, and lots of fun ways to explore the history of mathematics. I hope that, by describing our experience, I will convince you to take a group of undergraduates to the next conference in the Spring of 2010.

11:40 a.m.-12:25 p.m. **Shirley Gray**, California State University, Los Angeles
sgray@exchange.calstatela.edu

<p align="center">*A Centennial for Two Great Scholars*</p>

Heiberg's Translation of the Lost Palimpsest of Archimedes - 1907
Heath's Publication on Euclid's Elements - 1908
One century ago two of the greatest classical scholars in the history of mathematics translated a lost palimpsest to ask, "Did Archimedes (ca. 250 BC) really have the fundamental concepts of infinitesimal calculus?" Shirley Gray, Professor of Mathematics, California State University, Los Angeles, traces the search for an answer from 1907 to 2007.
The materials she presents have been collected at Oxford, Cambridge, London, Copenhagen, Vatican City, Jerusalem, and Constantinople as well as in cities across our country.

12:25 p.m.-1:45 p.m. Lunch

1:45 p.m.-2:15 p.m. Business and organizational meeting

2:15 p.m.-3:00 p.m **Alexander Karp,** Teachers College, Columbia University
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Mathematics in Soviet Schools, 1930s-1950s
This presentation will address the basic features of mathematics education in Soviet schools as it developed from the beginning of the 1930s, when the Central Committee of the Communist Party passed a series of resolutions regarding education, until the death of Stalin. This period is often viewed as the formative period of Soviet (Russian) mathematics education, which paved the way for all of its subsequent successes. The everyday practices that constituted this education system, however, remain relatively little known and little studied. This talk will focus on these everyday practices, drawing on surviving archival materials.

3:10 p.m.-3:55 p.m. **Marina Voulis,** University of New Haven
MVoulis@newhaven.edu
Mathematics Textbooks in Russia in the 18th Century
This presentation will discuss "Arithmetika", the first Russian mathematics textbook published in 1703. "Arithmetika" was written by the mathematics teacher Leonty Magnitsky. It played an important role in developing mathematical knowledge in Russia, and was the main mathematics textbook for the next 50 years. The author discussed the use of mathematical symbols, tables of arithmetic, proportions, and some special methods of multiplication. In particular, "Arithmetika" included chapters on arithmetic, algebra, geometry and applications of algebra to geometry, trigonometry.

4:05 p.m.-4:50 p.m. **David Roberts,** Prince George's Community College
robertsdl@aol.com
"A Peculiar Fascination": A Brief History of Linkages as Objects of Practice, Theory, and Pedagogy
Mathematical interest in linkages, systems of rods or bars connected by hinges or pivots, has followed an erratic pattern over the last 200 years. Initially emerging from the eighteenth-century machine design problem of converting rotary to straight-line motion, the topic attracted such nineteenth-century mathematicians as Chebyshev, Sylvester, and Kempe. Research activity declined after a flurry of publications in the 1870s, but several enthusiasts in the first half of the twentieth century proposed using linkages for pedagogical purposes, with limited success. I will consider some reasons for the failure of linkages to take hold in the schools, while briefly mentioning the revival of the subject as a topic of pure mathematical research in the late twentieth and early twenty-first centuries.

Sunday, March 15

9:15 a.m.-10:00 a.m. **Tom Bartlow** Villanova University
`thomas.bartlow@villanova.edu`
Edward V. Huntington on Teaching the Calculus
Edward V. Huntington was an important American mathematician in the first four decades of the twentieth century, although not as well known as others of his time. He is best remembered as one of the "American postulate theorists" and as the mathematician behind the method used to determine how many seats each state should have in the U. S. House of Representatives. He was also a dedicated teacher. Fairly early in his forty years of teaching calculus at Harvard University he developed definite strategies for presenting the subject clearly. He wrote up his views in comprehensive form on two occasions, twenty years apart. In between he published accounts of how he thought differentials should be presented and how definite integration should be introduced. This paper will discuss some of Huntington's ideas which teachers of calculus today may find helpful.

10:10 a.m.-10:55 a.m. **Michel Helfgott,** East Tennessee State University
*Pedagogical Implications of Cardano's **Ars Magna***
There is little doubt that Cardano's "The Great Art or the Rules of Algebra" (Ars Magna for short) is one of the most important books in the history of mathematics. Its impact goes beyond mathematics and includes the field of mathematical pedagogy. Through an analysis of Cardano and Ferrari's work on quartics, I will discuss five important pedagogical ideas that permeate Ars Magna.

11:05 a.m.-11:55 a.m. **Ilhan Izmirli,** American University
`izmirli@american.edu`
Does A Postmodernist Philosophy of Mathematics Make Sense? Is 2 + 2 = 5 Correct As Long As One's Personal Situation or Perspective Required It?
Postmodernism, one of the most influential philosophical and cultural movements of the twentieth century, is also one of the most misunderstood, partly because it does not display as well defined characteristics as do the classical and the modern philosophies. In this paper, we will start out by giving some major tenets of postmodernist philosophy. We will then show how they apply to natural sciences and in particular to mathematics. Finally, by clearly distinguishing between a postmodernist approach to mathematics and to pedagogy of mathematics, we will conclude by answering the question that was raised by Arthur T. White in his paper Mathematics in the Postmodernist Era: Is 2 + 2 = 5 correct as long as one's personal situation or perspective required it?