Mathematical Association of America History of Mathematics Special Interest Group

HOM SIGMAA News

Greetings from the HOM SIGMAA Chair

Date to Remember:

August 1 – 4, 2018

MathFest in Denver, Colorado

Inside this issue:

Dear HOM members,

I hope that this newsletter finds you well, and well into an exciting history of mathematics project or book! It is hard to believe that it has been seventeen years since the HOM SIGMAA was set on its path at the CSHPM meeting in 2001. Our SIGMAA has consistently been one of the largest and most active SIGMAAs. We also have a reputation for having a great time at our meetings, which draw people from outside our own membership. This may have something to do with members such as Dan Curtin who are such great role models for having a good time while engaging in deep and meaningful discussions.

As Chair of the SIGMAA, I would like to thank all the officers and volunteers, past and present, who keep us so active. We have some new projects on the horizon. Colin McKenney is in the process of completely revamping our website, now hosted by the MAA. Please send ideas for items you would like to see on the website to Colin or myself.

After several years, we hope to finally add to our Student Writing Contest (now in its 14th year! I started it when I was expecting my son, who is now 13). Our goal is to institute an article and book prize for expository writing in the history of mathematics. Once we have a prize committee, we will be soliciting nominations for both prizes. So start your list now!

What else should we have our sights set on? The MAA is pushing for SIGMAAs to have more of a presence at section meetings. Please consider having a HOM event at your next section meeting. Ideas include the obvious history of mathematics (HoM) session of papers. But you could push for an invited speaker in HoM, an historical display, a poster session, historical game show, a primary source reading, or any number of fun events. Also consider having a spotlight on an historical member of your section in each newsletter. To get a list of members in your section, please contact our Secretary, Cynthia Huffman.

We tend to focus our activities at the Joint Math Meeting. But there is a lot we can do outside of meetings. Any ideas for events, real or virtual are welcome.

Greetings from the HOM SIGMAA Chair (continued from page 1)

Perhaps resurrecting our virtual book club or form a virtual primary sources readings group? Please contact me with ideas or if you want to brainstorm or volunteer. The more minds the better!

Have a great spring and I hope to see you at a meeting soon.

Amy Shell-Gellasch
HOM SIGMAA Chair

2018 MathFest, Denver, August 1 - 4

Schedule of History Events at MathFest 2018

Teaching Undergraduate Mathematics with Primary Historical Sources Contributed Paper Session (Saturday afternoon)
Organizers: Dominic Klyve, Maria Zack, and Jeff Suzuki

In recent years there has been an increasing interest in using primary historical sources to teach undergraduate mathematics. New textbooks and expository papers have demonstrated ways that this can be done, and a recent National Science Foundation-funded grant effort has encouraged dozens of instructors, including some with little background in the history of mathematics, to employ this approach. This session seeks to bring together developers of materials for teaching with primary sources, instructors with classroom experience in using primary sources in their own teaching, and researchers studying the effects of teaching mathematics using primary sources on both students and instructors. Individuals with background in any of these three areas are encouraged to submit a talk.

What HOM Sessions Would You Like to See at Future MAA Meetings?

Keeping in mind that paper sessions, panel discussions, and special lectures are approved about a year in advance, please share your ideas for HOM events at the JMM and Mathfest with HOM SIGMAA Program Coordinator Toke Knudsen at toke.knudsen@oneonta.edu. Also, please contact him if you are willing to organize or co-organize such an event, or are interested in helping out in any way, big or small, with HOM. All suggestions are welcome!

2018 Meeting and Conference Calendar

ARITHMOS Reading Group
March 3-4, Danbury, Connecticut

Readings in the History of Mathematics from Original Sources seminars are 24-hour workshops on the classics of mathematics, read in the original or in a English translation. A dozen pages of mathematics is typically covered per session, which usually runs from 2 –6 p.m. on the first day, and 9 a.m. to 12:30 p.m. on the second. Organized by Rob Bradley and Chuck Rocca, ARITHMOS meets three to five times per year at Western Connecticut State University. The next meeting is scheduled for March 3-4. For more information, visit http://www.arithmos.org/.

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ORESME Reading Group
TBA, Northern Kentucky University

The ORESME (Ohio River Early Sources in Mathematical Exposition) Reading Group will meet in March 2018 at Northern Kentucky University to read selections from Kurt Hensel's 1908 *Theory of Algebraic Numbers*, representing his introduction of the field of p-adic numbers. For details, interested individuals should contact Dan Curtin (curtin@nku.edu) or Danny Otero (otero@xavier.edu). The dates of the meeting were not yet finalized at press time.

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The Americas Section of the International Study Group on Relations between History and Pedagogy of Mathematics
April 21-22, Boston, Massachusetts

The Americas Section of the International Study Group on Relations between History and Pedagogy of Mathematics has organized a special session for the Spring 2018 meeting of the AMS Eastern Section at Northeastern University in Boston, April 21–22. A full two days of talks are planned. For registration information, see http://www.ams.org/meetings/sectional/2252_other.html.

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The Canadian Society for History and Philosophy of Mathematics (CSHPM)
June 4-6, Quebec

CSHPM is holding its annual meeting in conjunction with the Canadian Philosophical Association at Université du Québec à Montréal (UQAM), June 4–6. The special session topic will be "History of Philosophy of Mathemat-

ics," and the Kenneth O. May lecture will be given by Emily Grosholz. For meeting information, see https://www.acpcpa.ca/cpages/current.

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8th European Summer University (ESU-8) on History and Epistemology in Mathematics Education
July 20-24, Oslo, Norway

The 8th European Summer University (ESU-8) on History and Epistemology in Mathematics Education will take place in Oslo, Norway, 20 – 24 July 2018. Online registration will be closed on 31 May, 2018. This small but fairly diverse 5-day "summer university" (i.e., intensive conference), can provide a nice landscape of various work in history of mathematics in mathematical education being conducted around the world. The complete announcement and more information can be found at https://esu8.edc.uoc.gr/ . The first page of the announcement can be found at the end of this newsletter.

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Convergence Calendar

Visit https://www.maa.org/press/periodicals/convergence/convergence-calendar for a list of events and meetings around the world which relate to the History of Mathematics.

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Save these dates for future MAA meetings!

Summer 2018	Denver, CO	August 1-4
Winter 2019	Baltimore, MD	Jan. 16-19
Summer 2019	Cincinnati, OH	July 31-Aug3
Winter 2020	Denver, CO	Jan. 15-18
Summer 2020	Philadelphia, PA	July 29-Aug1
Winter 2021	Washington, DC	January 6-9
Summer 2021	Sacramento, CA	August 4-7
Summer 2022	Washington, DC	August 3-6
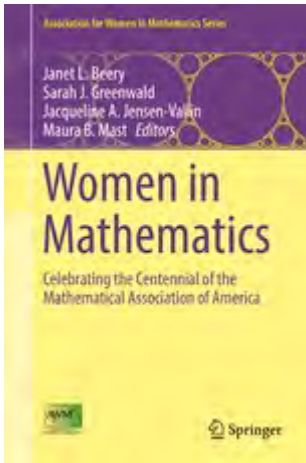
Springer has recently published "Women in Mathematics: Celebrating the Centennial of the Mathematical Association of America," edited by: Janet Beery, Sarah Greenwald, Jacqueline Jensen-Vallin, and Maura Mast. This collection of refereed papers celebrates the contributions, achievements, and progress of female mathematicians, mostly in the 20th and 21st centuries. This volume contains a diverse mix of current scholarship and exposition on women and mathematics, including biographies, histories, and cultural discussions. The multiplicity of authors also ensures a wide variety of perspectives.

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Since March 2014, members of the **Canadian Society for History and Philosophy of Mathematics (CSHPM)** have been contributing columns on the history or philosophy of mathematics to Notes of the Canadian Mathematical Society, the Society's official newsletter. Aimed at an interested audience of mathematicians who are not experts in these fields, the columns sum up current research and provide resources and ideas for use in teaching. All issues are freely available online at https://cms.math.ca/notes/

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Also in 2014, Birkhäuser assumed publication of the papers presented at CSHPM's annual meeting. (A yearly *Proceedings* volume has been produced since 1988, but it previously was distributed only to members. See http://www.cshpm.org/archives/annualmeetings.php for tables of contents.) Twelve to eighteen refereed articles, covering a variety of time periods and cultures and aimed at a general mathematical audience, appear each year under the title *Research in History and Philosophy of Mathematics*. The papers may be purchased individually or collectively; they may also be accessed at research libraries that subscribe to Springer's ebook collection. The most recent volume, from the 2016 conference in Calgary, has just appeared:

www.springer.com/us/book/9783319640921.

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The **Euler Society** is planning sessions for MathFest 2019 and 2020. For the latest newsletter of the Euler Society, check out

https://mailchi.mp/1b1abd331142/euler-society-newsletter-winter-96175?e=67806b814b .

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Nature recently published a commentary "The Fields Medal should return to its roots" by Michael Barany, a postdoctoral fellow in the Society of Fellows and Department of History, Dartmouth College. It can be found at https://www.nature.com/articles/d41586-018-00513-8 .

2018 HOM SIGMAA Executive Committee

Chair: Amy Shell-Gellasch, Eastern Michigan University

Email: amy.sg@earthlink.net

Secretary/Treasurer: Cynthia Huffman, Pittsburg State University

Email: cjhuffman@pittstate.edu

Program Coordinator: Toke Knudsen, SUNY Oneonta

Email: toke.knudsen@oneonta.edu

Electronic Resources Coordinator: Colin McKinney, Wabash College

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Prize Coordinator: Dorothee Blum, Millersville University

Email: Dorothee.Blum@millersville.edu

Past Chair: Daniel Otero, Xavier University

Email: otero@xavier.edu

MAA Convergence

Offers Interactivity with Mathematics History

Janet Beery, University of Redlands

Editor, *MAA Convergence*

MAA Convergence is both an online journal on the history of mathematics and its use in teaching and an ever-expanding collection of online resources to help its readers teach mathematics using its history. Founded in 2004 by well-known mathematics historians and educators Victor Katz and Frank Swetz, *Convergence* brings you a variety of interesting articles and teaching tools.

We highlight here some of our newest articles and resources for use in your classroom. "Trisecting an Angle Using Mechanical Means" is one of our many articles with interactive features. You and your students can use author Keith Dreiling's interactive applets to trisect angles using the methods of Hippias, Archimedes, and Nicomedes.
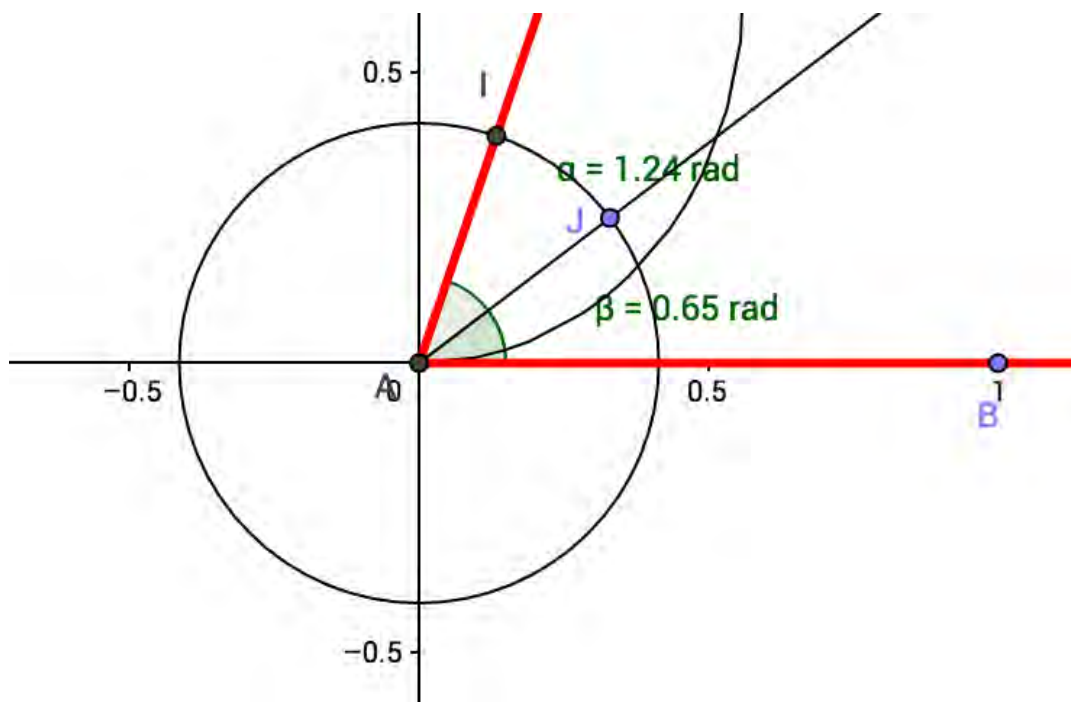
Above: Spiral of Archimedes for trisecting angles from an applet by Keith Dreiling

One of Convergence's themes throughout this past year has been the history of medieval mathematics, with several authors bringing this topic to life:

In "The Mathematical Cultures of Medieval Europe," *Convergence* founding editor Victor Katz presents mathematics of Muslim, Jewish, and Catholic scholars and discusses how culture influenced it.

In "Recreational Problems in Medieval Mathematics," Katz traces the "Men buying a horse" and "Men finding a purse" problems across time, place, and culture.

Above: Table for "golden numbers" to determine the date of Easter in Trevelyon's Miscellany, *published in England in 1608. For more images, see* MAA Convergence's "Mathematical Treasures," *where this image appears courtesy of World Digital Library.*
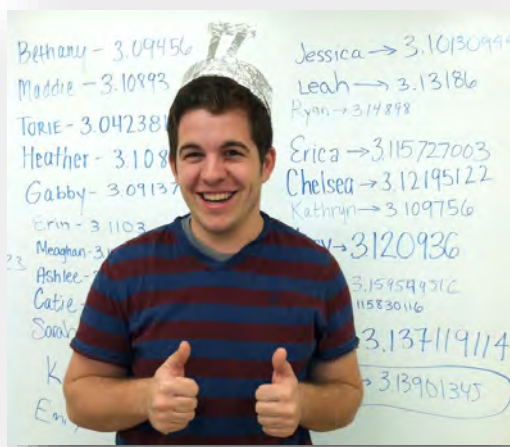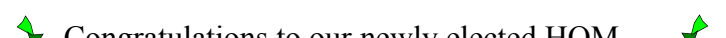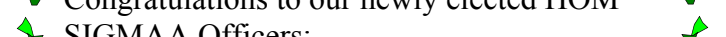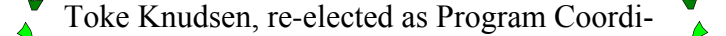
"The Mathematics of Levi ben Gershon in the Classroom," in which Shai Simonson shares his translations of works by Levi (1288-1344) on the value of pi, calculating square roots, and a selection of word problems.

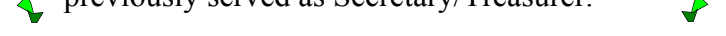*Left: A recently crowned Pi King, whose personal estimate of pi was closest to the true value, celebrates his victory in one of Shai Simonson's classes.*

"Impacts of a Unique Course on the History of Mathematics in the Islamic World," in which author Nuh Aydin shares his motivation for developing his course, its structure and content, its community service component, and its impacts on students, community members, and his own scholarship.

"Moses ibn Tibbon's Hebrew Translation of al-Hassar's *Kitab al Bayan*," by Jeremy I. Pfeffer, features the arithmetic of fractions as you've (possibly) never seen it before!

Congratulations to our newly elected HOM SIGMAA Officers:

Toke Knudsen, re-elected as Program Coordinator, and Cynthia Huffman, new Secretary/Treasurer.

A big "Thank you!" to Larry D'Antonio, who previously served as Secretary/Treasurer.

In "Illustrating *The Nine Chapters on the Mathematical Art*: Their Use in a College Mathematics History Classroom," Joel Haack shares how he used his experiences on an MAA Mathematical Study Tour to China to enrich his teaching.

Right: The civil servant from the Sui Dynasty (581-618) depicted in this statue in the National Museum of China was an intended user of the Nine Chapters.

In "A Series of Mini-projects from **TR**ansforming **I**nstruction in **U**ndergraduate **M**athematics via **P**rimary **H**istorical **S**ources," the TRIUMPHS team introduces their collection of mini-Primary Source Projects (mini-PSPs), which so far consists of

"The Derivatives of the Sine and Cosine Functions" (by Dominic Klyve),

"Why be so Critical? Nineteenth Century Mathematics and the Origins of Analysis" (by Janet Barnett)

"Connecting Connectedness" (by Nicholas Scoville)

"Generating Pythagorean Triples" (by Janet Barnett).

Watch for new projects in *Convergence*!

Right: Students work on a Primary Source Project under the supervision of Janet Barnett at a TRIUMPHS Site Tester Workshop in Denver, Colorado, in September of 2016.

In "Math Origins," a new series in which author Erik Tou traces the historical development of concepts seen in today's undergraduate curriculum, we have two articles so far, "The Totient Function" and "Orders of Growth."

Our "Index to Mathematical Treasures" includes hundreds of images for use in your classroom from dozens of libraries and sources. Our chief "treasure hunter" is *Convergence* founding editor Frank Swetz.

See all of these articles and more at *MAA Convergence:*

http://www.maa.org/press/periodicals/convergence

Join us at the Convergence of mathematics, history, and teaching!

Janet Beery, Editor, *MAA Convergence*

HOM on Display

A new feature of the HOM SIGMAA Newsletter is a review of a museum or library with an exhibit or collection related to the History of Mathematics. If you would like to submit an article for HOM on Display, please send it to Cynthia Huffman at cjhuffman@pittstate.edu. Our first HOM on Display review is below:

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Museum Review

Mathematica

at The Henry Ford Museum of Innovation. Dearborn Michigan.

https://www.thehenryford.org/visit/henry-ford-museum/exhibits/mathematica/

by Amy Shell-Gellasch

My son and I visited The Henry Ford; they have rebranded and that is the name, The Henry Ford. You are just supposed to know it is The Henry Ford Museum of Innovation. If you have not heard of The Henry Ford, you may have heard of its other half, Greenfield Village, the outdoor 19th century museum that has in its collections such wonderful things as the Wright brother's actual bicycle shop and Edison's Menlo Park laboratory, building and all. The Henry Ford started as a car and train museum but has expanded over the years to everything innovative. But it still has an amazing collection of cars and trains, to include many of the Presidents' cars, including Kennedy's. In the fall of 2017 they opened a permanent exhibit about mathematics titled *Mathematica* (no connection to the computer algebra package.) It is not a large exhibit, maybe 1500 sq. ft. But it is beautifully done, with just the right variety of topics and amount of description. If you read every detail, you could complete the exhibit in less than an hour. But most people, like my son, probably spend about 20 minutes.

I teach at Eastern Michigan University about 30 minutes away, and I offered extra credit to my mathematics for elementary education students for going. I was surprised by how many got themselves there and really enjoyed it. I know they enjoyed it because in many of their write-ups (extra credit is not free for me) they mentioned that they were surprised at how much they actually liked it.

The topics exhibited include a gravity well, a Mobius trip with arrow shaped car on a track, a normal curve ball drop, lightbulbs that show multiplication of three numbers as a volume, a random walk generator with a random die roll for N/S and E/W, minimal surfaces with soap bubbles, non-Euclidean geometry, projective geometry, and a history wall.

The history wall is not new to the exhibit but was compiled at some point maybe mid-20th century and updated in the 1980s. So the history wall is itself a piece of history. They also have a small display accompanying the wall on the Field's Medal. Unfortunately, by not updating it, they missed the opportunity to include the important fact that we now have a female Field's Medalist.

Three of the exhibits really caught my fancy. Right as you come in is a hyperboloid. Since I worked on the Olivier String Models while at West Point, I was immediately drawn to this object. Theirs was made of thin metal rods instead of string. The interesting part is they have a matching metal rod on a rotating arm that passes through a cross section of the hyperboloid as it rotates. In this way you can actually see the straight line form the apparently curved surface of the hyperboloid.

Second is the case on projective geometry (see figure next page). From the side the viewer sees several different three-dimensional prisms and surfaces of various colors suspended at different locations. But when you look through a small viewer at the right end of the case, you see that the objects all come together perfectly to

form a two-dimensional square with the different colors meeting at the axis of the viewer's line of sight.

Finally, my absolute favorite is the exhibit on the conic sections. This is the image across the top of the exhibit website provided above. Inside the octagonal enclosure shown, are thin wires arrayed in flat, cylindrical, and conical shapes. Small beams of light span these sets of wires to show the conics as well as the intersection of the conics and other surfaces. The exhibit is accompanied by music that reminded me of some of the more sleep inducing but visually stimulating scenes from Kubrick's *2001 A Space Odyssey*.

Though I would have loved for the exhibit to be larger, I think it is probably the right size for the non-mathematician. Likewise, I think a little more could have been said in the descriptions, but again they probably rightly erred on the side of "less is more". If you are in the metro Detroit area, The Henry Ford and Greenfield Village are well worth the day, and you would need a full day to do both! As an added bonus, my alma mater, **The** University of Michigan is just down I-94. Since moving to Ann Arbor this summer, my next plan is getting to know their special collections. Hopefully I will have something to share about their rare books and objects in a future HOM newsletter.

Visit the HOM SIGMAA website today!!

The HOM SIGMAA website (http://sigmaa.maa.org/hom/) includes HOM SIGMAA news, announcements of upcoming conferences, links to other history of mathematics pages, and other resources. Suggested additions to the website (for example, conference information, links, or photos) are always welcome at mckinnec@wabash.edu.

The History of Mathematics Special Interest Group
of the Mathematical Association of America

is pleased to announce its fifteenth annual

Student Paper Contest
in the History of Mathematics

This contest is open to all undergraduate students[π]

Papers will be judged by a panel of specialists for content, originality, and presentation. Typically first and second place winners are chosen.

Submission Guidelines

- Topics can be drawn from any field of mathematics.
- Papers can address a single person or topic, or be an historical survey of a topic or school of thought.
- Submissions should be approximately 5000 words (approximately 12 double-spaced 12 pt. pages) in length with font that is easy to read.
- Submissions should be in a single PDF file, including a title page with title of paper, the author, school, and contact information.
- If all of the following is not on the above-mentioned title page, then please include it on a separate cover sheet: your name, the title of your paper, your institution, your supervising instructor (if applicable), your e-mail address, your school address, and your permanent postal address.
- Papers should include a full citation list.
- Papers should not draw too heavily from web sources.[ℵ]
- Students submitting a paper need not be currently taking a history of mathematics course.
- All papers should be single-authored.
- Eligible papers include, but are not limited to, those finished in the spring 2017 but after the spring 2017 deadline, those finished in the fall 2017, and those papers that will be finished in the spring before the 2018 deadline.

Submission Deadline: Saturday, March 24, 2018

Results will be announced via email
and on the HOM SIGMAA website in May.

Submissions and questions can be directed to
Dr. Dorothee Blum at Dorothee.Blum@millersville.edu

[π] Students who have graduated less than a year ago but wrote their paper while still an undergraduate my also participate.
[ℵ] Web sources that give access to print material, such as JTSOR, are completely acceptable.

HPM

International Study Group on the Relations Between
the HISTORY and PEDAGOGY of MATHEMATICS
An Affiliate of the International Commission on
Mathematical Instruction

**8th EUROPEAN SUMMER UNIVERSITY
ON HISTORY AND EPISTEMOLOGY IN MATHEMATICS EDUCATION**

ESU-8

**20-24 July 2018,
Oslo & Akershus University College of Applied Sciences
Oslo, Norway**

https://esu8.edc.uoc.gr

The initiative of organizing a *Summer University* (SU) on the *History and Epistemology in Mathematics Education* belongs to the French Mathematics Education community in the early 1980's. From those meetings emerged the organization of a SU on a European scale, as the *European Summer University* (ESU) *on the History and Epistemology in Mathematics Education*, first organized in Montpellier (France), 1993. Since then, ESU was successfully organized in different places in Europe: Braga (Portugal), 1996; Louvain-la-Neuve and Leuven (Belgium), 1999; Uppsala (Sweden), 2004; Prague (Czech Republic), 2007; Vienna (Austria), 2010; Copenhagen (Denmark), 2014[1]. By now, it has been established into one of the main international activities of the HPM Group, which - from 2010 onwards - is organized every four years, so that every two years at least one major international meeting of the Group takes place; namely, ESU and the HPM Satellite Meeting of ICME.

For more detailed and regularly updated information, visit
https://esu8.edc.uoc.gr   http://www.clab.edc.uoc.gr/hpm/meetings

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[1] A brief account of the history of ESU, is available at http://www.clab.edc.uoc.gr/HPM/HPMinME-TopicalStudy-18-2-16-NewsletterVersion.pdf §2.1.2.