

HOM SIGMAA News

Volume XII, Number 1

January 2022

Greetings from the HOM SIGMAA Chair

Date to Remember:

August 3 – 6, 2022
MathFest in Philadelphia, PA

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I am your new HOM SIGMAA chair and I am from Chile. My love for math, together with my Mapuche indigenous roots from South America, sparked my interest in the history of mathematics of the pre-Columbian Americas. I taught for ten years at a Chilean university by the Strait of Magellan in the Patagonia before coming to the US. While I recently retired from Millersville University of Pennsylvania, I am looking forward to remaining active in the mathematical community. It is an honor to serve as your chair and I hope to fill Amy's shoes adequately.



This past fall we continued our virtual lecture series with excellent talks by Nuh (Noah) Aydin and Cynthia Huffman, and in January, Adrian Rice, gave his lecture originally scheduled for JMM 2022 HOM SIGMAA. We hope to have a presence at JMM 2023 with a HOM SIGMAA guest speaker.

Mark your calendars for MathFest 2022 in Philadelphia, August 3-6. We are sponsoring two HOM sessions, and I hope to see you in person.

A reminder that submissions for the Nineteenth Annual Student Paper Contest in the History of Mathematics are due on Thursday, March 31, 2022, the flyer can be found at the end of this newsletter.

If you have any suggestions for speakers for our Virtual Series Lectures, please contact Jemma Lorenat, the Program Coordinator. Our Electronic Resources Coordinator, Antonia Cardwell, is soliciting History of Mathematics Course Outlines and library resources for the HOM SIGMAA page.

Best regards from Ximena

Ximena Catepillán
Chair, HOM SIGMAA

In the picture: Good times at JMM 2019 in Baltimore with friends Jackie Dewar and Cynthia Huffman

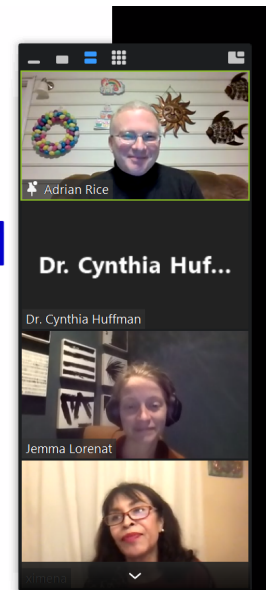
Pandemic Interferes with JMM2022

Originally scheduled for in-person in Seattle, WA, the 2022 Joint Meetings were postponed and rescheduled to be held virtually. The HOM SIGMAA invited address by Adrian Rice on Ada Lovelace was presented via Zoom on January 12th.

“Beyond the strength of a woman’s physical power”
Mathematics, Machines, and
the Mind of Ada Lovelace

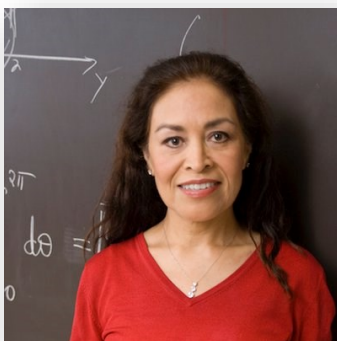
Adrian Rice

*Department of Mathematics
Randolph-Macon College*



Congratulations and Thanks for Service!

Congratulations to newly elected HOM SIGMAA officers - Ximena Catepillán (Chair) and Antonia Cardwell (Electronic Resources Coordinator), both of Millersville University in Pennsylvania. HOM SIGMAA is so grateful to Amy Shell-Gellasch, Danny Otero, and Andrew Perry for their years of service as Chair, Past Chair, and Electronic Resources Coordinator, respectively. Amy will still be on the HOM SIGMAA Executive Committee as Past Chair. **Thanks** for your great work, Amy, Danny, and Andy!



Ximena Catepillán
HOM SIGMAA Chair



Antonia Cardwell
*HOM SIGMAA Electronic
Resources Coordinator*



Amy Shell-Gellasch
*HOM SIGMAA
Past Chair*

HOM SIGMAA Student Travel Grants Available

HOM SIGMAA is pleased to announce travel grants to graduate and undergraduate students. Money is available to help students travel to meetings to present a paper or poster in the history of mathematics. Details can be found in the HOM SIGMAA community on MAA Connect, www.connect.maa.org.

2022 HOM SIGMAA Executive Committee

Chair: Ximena Catepillán, Millersville University,
Ximena.Catepillan@millersville.edu

Secretary/Treasurer: Cynthia Huffman, Pittsburg State University,
cjhuffman@pittstate.edu

Program Coordinator: Jemma Lorenat, Pitzer College,
jemma_lorenat@pitzer.edu

Electronic Resources Coordinator: Antonia Cardwell, Millersville Univ.,
Antonia.Cardwell@millersville.edu

Prize Coordinator: Amy Shell-Gellasch, Eastern Michigan University
ashellge@emich.edu

Past Chair: Amy Shell-Gellasch, Eastern Michigan University,
ashellge@emich.edu

Save these dates for future MAA meetings!

MathFest 2022	Philadelphia, PA	August 3-6
MathFest 2023	Tampa, FL	August 2-5
MathFest 2024	Indianapolis, IN	August 7-10

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.

Small grants for the history of mathematics classroom are available

HOM members who need some help to purchase items for use in the teaching of the history of mathematics are encouraged to apply for a small grant. Information on how to apply can be found on our website <https://homsigmaa.net/> and at the end of this newsletter.

FIRST WEDNESDAYS VIRTUAL SPEAKER SERIES

HOM SIGMAA began a new speaker series during Spring 2021, organized by Jemma Lorenat, HOM SIGMAA Program Coordinator, which continued in Fall 2021.

Speakers and presentations during the fall included:

- Nuh (Noah) Aydin, Kenyon College, *A Mathematician's Journey into History of Mathematics: Impacts, Reflections, and Lessons*, November 3
- Cynthia Huffman, *Cosets in the Belfry*, December 1

Watch the HOM SIGMAA community on MAA Connect for information on upcoming speakers during Spring 2022.

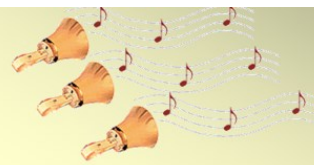
A Mathematician's Journey into History of Mathematics: Impacts, Reflections, and Lessons

by (Nuh ~ نوح ~ Noah) Aydin



Department of Mathematics & Statistics
Kenyon College

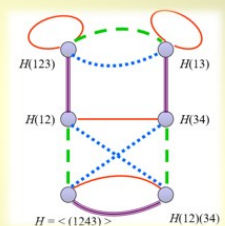
<http://www2.kenyon.edu/Depts/Math/Aydin/>



Cosets in the Belfry
(Bell - y Math)



Cynthia Huffman
University Professor
Mathematics Department
Pittsburg State University
cjhuffman@pittstate.edu



Suggestions for Teaching with History from *Convergence*

Janet Barnett and Amy Ackerberg-Hastings

Editors, *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. We highlight here some of our newest articles and features.

Two articles by *Convergence* associate editors blend biography, the history of mathematical practice, and subjects in the grades 8–16 mathematics curriculum. In “[Helping Ada Lovelace with her Homework: Classroom Exercises from a Victorian Calculus Course](#),” Adrian Rice highlights ten problems that puzzled Ada Lovelace as she learned calculus in a sort of independent study course guided by Augustus De Morgan and reminds readers that similar problems often confuse students today. Toke Knudsen reconstructs the life of a now-obscure Danish mathematics professor and points out unique pedagogical features of “[E. G. Ziegenbalg’s Danish Translation of Euclid’s *Elements*](#).”

EXERCISE. Shew that the equation

$$\varphi(x+y) + \varphi(x-y) = 2\varphi x \times \varphi y$$

is satisfied by

$$\varphi x = \frac{1}{2} (a^x + a^{-x})$$

for every value of a : and also that

$$\varphi(x+y) = \varphi x + \varphi y$$

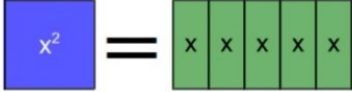
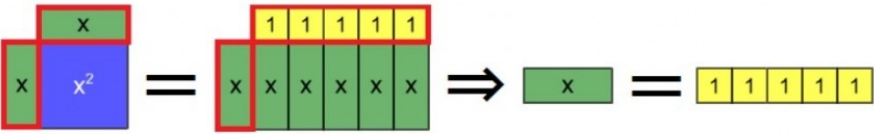
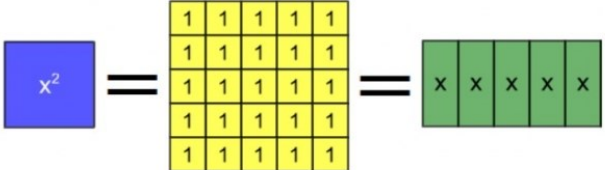
can have no other solution than

$$\varphi x = ax$$

Above: An exercise Lovelace attempted from De Morgan’s *Elements of Algebra*.

In “[Algebra Tiles Explorations of al-Khwārizmī’s Equation Types](#),” Günhan Caglayan shows how the manipulatives found in many mathematics and mathematics education departments could help students visualize the verbal solutions described by Muhammad ibn Musa al-Khwārizmī through modeling activities that offer a multi-representational approach to equation solving, which encourages diversity in algebraic reasoning and can promote reflection about its teaching. With the assistance of Samuel Navarro, associate editor Ximena Catepillán has initiated an effort to increase the language accessibility of *Convergence* by translating into Spanish the article she co-authored with Cynthia Huffman and Scott Thuong, “[Misterios Matemáticos de Rapa Nui con Actividades para el Aula de Clases](#).”

Associate editors have also developed new finding aids for the journal. Mike Molinsky is providing ways to view *Convergence*’s popular “[Problems from Another Time](#)” feature [chronologically](#), [geographically](#), or [by subject](#). Laura Turner has organized an [alphabetical list of book, web, and audiovisual reviews](#) published in *Convergence* from 2004 to 2016.

A square is equal to five roots of the same	
the root of the square is five	
and the square is twenty-five, which is equal to five times its root.	

Above: An example of how algebra tiles can illustrate the rules for solving equations used by al-Khwārizmī.

In our article series, Danny Otero has wrapped up his series of curricular units based on primary source texts for use in teaching and learning trigonometry, “[Teaching and Learning the Trigonometric Functions through Their Origins](#),” with Episodes 5 and 6, on al-Bīrūnī’s geometrical model for the shadow-casting gnomon—which helped motivate the concepts of tangent, cotangent, secant, and cosecant—and Regiomontanus’ fully comprehensive treatment of trigonometry, the first to appear in Europe. Janet Heine Barnett has contributed “[Gaussian Guesswork: Three Mini-Primary Source Projects for Calculus 2 Students](#)” to the ongoing “[A Series of Mini-projects from TRansforming Instruction in Undergraduate Mathematics via Primary Historical Sources](#),” which presents mini-Primary Source Projects (PSPs) from the TRIUMPHS team.



Above: The image of Regiomontanus found in *Convergence*’s [Portrait Gallery](#).

As always, *Convergence*’s extensive collection of “[Mathematical Treasures](#),” images and descriptions of texts and objects significant to the history of mathematics; its “[Conference Calendar](#)” (edited by associate

editor Bud Boman), an up-to-date guide to conferences and events online and around the world that feature or include the history of mathematics and its use in teaching; and much more are available via the homepage:

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

Interested in contributing? We'd love to hear from you at convergence@maa.org! *Convergence* publishes expository articles on the history of topics in the grades 8–16 mathematics curriculum; translations of primary sources; classroom activities, projects, or modules for using history to teach mathematics; and classroom testimonials after applications of such activities, projects, or modules. For more details about *Convergence*'s submission and refereeing process, see our Guidelines for Authors at

<https://www.maa.org/press/periodicals/convergence/guidelines-for-convergence-authors>.

Visit the HOM SIGMAA website today!!!

The HOM SIGMAA website (<https://homsigmaa.net/>) 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 Antonia.Cardwell@millersville.edu.



MAA invites you to join the online community, MAA Connect. This member benefit is designed for MAA members to connect, communicate, and collaborate with peers. This is a platform to share ideas, ask questions, and network.

You can log in to MAA Connect using your MAA membership username and password. The webpage at <https://connect.maa.org/home> provides more information on getting started and how to use MAA Connect. Use this information to set up your profile, or use the Getting Started instructions as you familiarize yourself with the platform.

If you have any issues logging in, please contact MAA Customer Service at 800-331-1622 or maaservice@maa.org.

A 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.

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Math Objects at the Smithsonian

Dr. Amy Shell-Gellasch
Eastern Michigan University

Interested in going to a museum to view mathematical objects, but none is nearby? Want to share museum quality mathematical objects with your students? Your passport on this adventure is images. Hopefully you are aware of the Convergence “Mathematical Treasures” and Portrait collections. But if you want to go directly to a source, then the Smithsonian National Museum of American History (NMAH) has a great resource for you! The Smithsonian, and NMAH in particular, has an extensive collection of mathematical and scientific objects, documents, and photos. Many of these items are arranged into object groups, collection of items related by maker, type, or use. A large number of these object groups have been put online. Each group contains a main page with a short description of the group, their importance, providence, use, and such. Then each individual object has a page with high-resolution images and more information about the individual item.

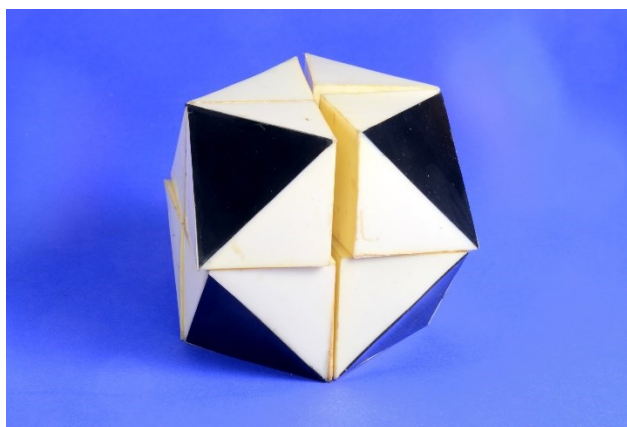
<https://americanhistory.si.edu/collections/object-groups>

There are over thirty object groups that focus on mathematical objects, many of which are related to the teaching of mathematics. Four historians of mathematics that you might know have contributed to these groups: Curator of Mathematics at NHAM Peggy Kidwell, Amy Ackerberg-Hastings, Judy Green, and Amy Shell-Gellasch. In this limited space I would like to showcase two object groups.

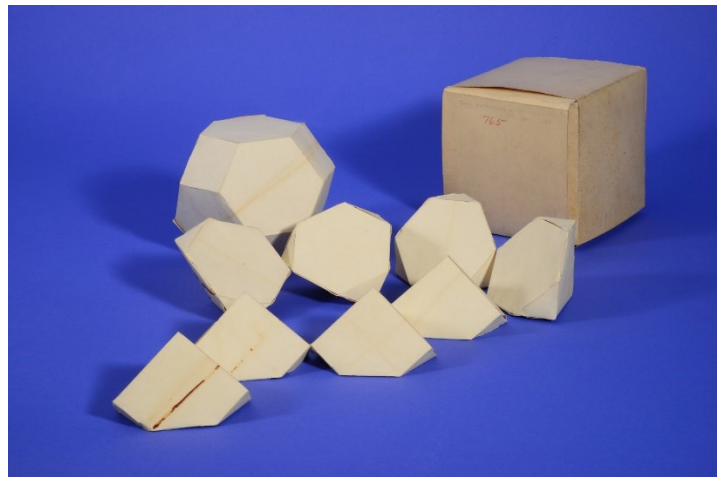
Several object groups are of sets of geometric models that depict solids, surfaces, and polygons. Most of these objects are teaching models. One such group is the A. Harry Wheeler solid dissection models of the 1930s.

<https://americanhistory.si.edu/collections/object-groups/geometric-models-dissected-polyhedra>

Below is a lovely model of a dissected polyhedral: Cube Transformable into Cuboctahedron and Octahedron.



Another Wheeler dissected polyhedral, this one made of paper, is the Cube containing a Tetrakaidekahedron, or Two Snub Octahedron.



For a completely different type of object group, NMAH has a large set of protractors that were donated to the Smithsonian. Yes, there are many kinds of protractors, as well as compasses, dividers, and other measuring devices.

<https://americanhistory.si.edu/collections/object-groups/protractors>

The collection of protractors includes various “basic” versions used in education, sturdy ones used in surveying and navigation, precision ones used in engineering and drafting, and specialty protractors.

This precision protractor is from the early 20th century and was used by a copper mining firm in northern Michigan.



And this bad boy has a lot going on. It is a Lyman protractor from 1858. It was used in engineering drawing and included a tri-level and a set square. Clips allow the various parts to be moved along the T-square.



Enjoy all the collections, mathematical and otherwise, available at the Smithsonian. Maybe you are also interested in the Bristol-Myers Squibb European Apothecary collection of 1300 pharmaceutical artifacts! Who knows?



We are proud to announce a new peer-reviewed journal, *Euleriana*, dedicated to the life and work of Leonhard Euler, with secondary foci on Euler's legacy and the wider world of scholarly work in the 18th century. (See journal's [Aims and Scope](#) for more information.) The journal aims to be a leader in the expanding world of Euler scholarship.

Euleriana is an open-access journal, meaning that all of our content is freely available without charge to the user or their institution. Volume 2 will be appearing soon.

We'd love to hear from you! Euleriana is now accepting submissions, including translations, historical and archival notes, and book reviews. Potential authors are encouraged to contact the editors (Erik R. Tou, etou@uw.edu, and Christopher Goff, cgoft@pacific.edu) to inquire about papers before submission.

HOM SIGMAA Small Grants

Guidelines and Procedures

Purpose: The HOM SIGMAA wants to aid its members in their quest to bring the joys of the history or mathematics to their students. These small monetary grants will allow HOM SIGMAA members to purchase items that will aid in learning the history of mathematics. For example, a classroom set of abacus or materials to make an historical model.

Guidelines

1. Recipients must be a current member of the HOM SIGMAA
2. The idea is to purchase items, materials to make a historical model, or materials that can be used year after year. (Not supplies that will be used up quickly.)
3. These materials may be used by an individual's colleagues, but belong to the HOM SIGMAA member and not their department.
4. Items or materials must clearly be for the instruction of a historical topic.
5. Grants will be for amounts up to \$100 and considered on a rolling basis (so apply early in the year.)
6. Approval of the grant is at the sole discretion of the HOM SIGMAA executive board.
7. Applications can be made at any time, but may take several weeks to be approved and paid out by the MAA. So plan ahead.
8. Receipts for purchased items is preferable. But if purchase depends on funding, receipts may be required after purchase.
9. Total annual grants dispersed will not exceed \$1000 per year and are subject to HOM SIGMAA funding needs.
10. Preference will always be given to first-time grantees. And the HOM SIGMAA has the right to deny any request if they feel a single member is requesting too often.

How to apply

Please send the application form (available on the HOM SIGMAA website) in Word or PDF to the Chair of the HOM SIGMAA via email.

HOM SIGMAA Classroom Small Grant

Name

Institution

Email

Phone

Address

Funds requested

Item(s) to be purchased

Purpose or use of items

HOM SIGMAA Student Travel Grants

Guidelines and Procedures

Purpose: The HOM SIGMAA wants to support students of the history of mathematics. We will offer travel grants (in the form of travel expense reimbursements) for students traveling to conferences to give a paper or poster on the history of mathematics. Grants are up to \$250 for a local/regional/sectional meeting, and \$350 for a national/international meeting. We encourage students to attend MAA meetings, but grants are not limited to MAA meetings. Submit application materials prior to the meeting; submit registration/travel/lodging receipts and verification of talk after the meeting.

Guidelines

1. Travel must be completed while a student or the summer immediately following graduation.
2. Approval of the grant is at the sole discretion of the HOM SIGMAA executive board.
3. Applications can be made at any time, but may take several weeks to be approved and are paid out by the MAA after travel is completed. So plan ahead.
4. Total annual grants dispersed will not exceed \$1500 per year and are subject to HOM SIGMAA funding needs and will be considered on a rolling basis.
5. Preference will always be given to first-time grantees.

How to apply (prior to meeting):

1. Please send the application form (available on the HOM SIGMAA website) in Word or PDF to the Chair or Secretary of the HOM SIGMAA via email.
2. Have your research advisor email the Chair or Secretary of the HOM SIGMAA a letter verifying your status and stating the nature of your research.

Reimbursement (post meeting):

Email scans of the following to the HOM SIGMAA:

1. travel receipts totaling the grant amount or more
2. program page verifying your participation.

HOM SIGMAA Student Travel Grant Application

Full Name:

Status: (circle one)

Graduate student

Undergraduate student

Home Institution:

Email:

Address:

Conference title and session title:

Location and dates:

Title of talk/poster:

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

is pleased to announce its nineteenth 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 complete contact information.
- Papers should include a full citation list.
- Papers should not draw too heavily from web sources.[§]
- Students submitting a paper need not be currently taking a history of mathematics course.
- All papers should be single-authored.
- Eligible papers are those written in the past year and while the author was an undergraduate.

Submission Deadline: Thursday, March 31, 2022

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

Submissions and questions can be directed to
Dr. Amy Shell-Gellasch ashellge@emich.edu

^π Students who have graduated less than a year ago but wrote their paper while still an undergraduate may also participate. Graduate and high school students may also submit for an honorable mention.

[§] Web sources that give access to print material, such as JSTOR, are completely acceptable.