POM SIGMAA

Philosophy of Mathematics Special Interest Group of the MAA

Calendar

Jan. 10-13, 2018: Joint Math Meetings 2018, San Diego, CA

Feb. 1, 2018: Deadline papers to CSHPM/CPA meeting

June 4-6, 2018: Joint CSHPM/CPA meeting, Université de Quebec, à Montréal

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Officers

Chair
Carl Behrens, Alexandria, VA, behrenscarl@yahoo.com

Past Chair
Thomas Drucker, University of Wisconsin-Whitewater, druckert@uww.edu

Program Director
Bonnie Gold, Monmouth University, bgold@monmouth.edu

Secretary-Treasurer
Sally Cockburn, Hamilton College, scockbur@hamilton.edu

Public Information Officer
Kevin Iga, Pepperdine University, kiga@pepperdine.edu

New officers (Feb. 2018):

Chair-Elect
Bonnie Gold, Monmouth University, bgold@monmouth.edu

Program Director
Jeff Buechner, Rutgers University, buechner@rutgers.edu

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In this issue

From the Chair

2017 Election Results

Two positions on POMSIGMAA's Executive Board were up for reelection in October 2017. Thanks to all those who took part in this vital process.

Bonnie Gold, our current Program Director, becomes **Chair-Elect** in February 2018. She will take over as Chair in 2019. Bonnie has been a driving force in POMSIGMAA since it was first established in 2002, and before. We expect great things for POMSIGMAA as she continues her leadership and guidance.

Replacing Bonnie as **Program Director** will be **Jeff Buechner**. Jeff's eager interest and pursuit of philosophical issues and his stimulating explorations of the views of philosophers both past and current are familiar to those of you who have attended POMSIGMAA sessions at Joint Meetings and MathFests. I personally have had many stimulating and rewarding interchanges with him. We welcome him to the Executive Board and expect much from him in the way of ideas to interest the members of POMSIGMAA.

While we are delighted to add Jeff to our Board, we will unfortunately lose the services of **Tom Drucker**, whose term as Past Chair expires in January 2018. Before being elected Program Director and Chair, Tom served many years as Treasurer of POMSIGMAA. His presence on the Board has been highlighted by many successful events and meetings, including joint meetings with other groups and organizations that broadened the contacts between the philosophically minded beyond the usual. I'm sure he will continue his interest and contributions to the exploration of the philosophy of mathematics. We want to thank him for his long service.

Listserv at your Service

Everyone who antes up membership fees to POMSIGMAA automatically receives postings from fellow members (unless they have turned it off) and are free to contribute their own ideas to the philosophical community. We put a lot of effort in inviting speakers and organizing paper sessions at meetings, but the **listserv** provides a forum for ideas from all of us, including those who don't or can't get to meetings.

This year has been particularly fruitful in stimulating discussion of philosophical issues. The debate on realism and nominalism went on for several Spring months, and Kevin Iga revived the interchange in September with his analysis of an article by William Lane Craig on the existence of absolute infinity. Gizem Karaali stimulated an astonishing outpouring of enthusiasm with her request for examples of mathematical beauty.

I urge everyone not to be shy about raising philosophical questions for the rest of us to relish. There is much to talk about. In my opinion, the question of the existence of mathematical objects is far from settled. I'd also like someone to explain to me what distinguishes structuralism from other philosophical positions, and what it achieves that others don't. But your interests and questions are all important to us. Enjoy!

A philosophy of math guide to the Joint Math Meetings
San Diego, CA, January 10-13, 2018

POM SIGMAA will again be at the **Joint Math Meetings** in **San Diego**, January 10-13, 2018. As is our tradition, we have an invited speaker after our business meeting, and a contributed paper session.

Invited Speaker: Rafael Núñez, UCSD

Philosophy of Mathematics in the 21st Century: Why does it need the Sciences of the Mind?
Thur. Jan. 11, 6:15 p.m., Room 5B, Upper Level, San Diego Convention Center

Abstract: Mathematics is about abstract concepts, precise idealizations, relations, calculations, and notations, all of which are made possible by the amazing (albeit limited) workings of the human mind and the biological apparatus that supports it. Over the past 50 years the scientific study of mental phenomena has made enormous progress in understanding their psychological, linguistic, and neurological underpinnings. Traditional approaches in Philosophy of Mathematics such as Platonism, Formalism, Logicism, and Intuitionism - developed many decades, if not centuries prior to these developments - could not benefit from these findings. I argue that today, in the 21st century, philosophical investigation - e.g. What is mathematics? What is it for? How does it work? - should be informed by, and be compatible with findings in the sciences of the mind. I'll illustrate my arguments with research addressing issues in hyperset theory, infinitesimal calculus, and mathematical induction.

Rafael Núñez is Full Professor at the Department of Cognitive Science at UCSD. He has co-authored, with George Lakoff, *Where Mathematics Comes From: How the Embodied Mind Brings Mathematics Into Being*.
We will have our **reception** at 5:30 pm, then a **business meeting** at 6:00 pm, followed by the **guest lecture** at 6:15 pm.

JMM Contributed Paper Session: *Philosophy of Mathematics as Actually Practiced*

Friday, January 12, 2018, Room 6D, Upper Level, San Diego Convention Center
Organizers: Bonnie Gold, Sally Cockburn, and Tom Drucker

8:00 a.m.   1135-A5-144   David M. Shane, "The Eroding Foundation of Mathematics"

8:30 a.m.   1135-A5-362   James Henderson, "When Physicists Teach Mathematics"

9:00 a.m.   1135-A5-609   Daniel C. Sloughter, "Hardy, Bishop, and Making Hay"

9:30 a.m.   1135-A5-301   Jae Yong John Park, "Fictionalism, Constructive Empiricism, and the Semantics of Mathematical Language"

10:00 a.m. 1135-A5-814   Chandra Kethi-Reddy, "Gian-Carlo Rota and the Phenomenology of Mathematics"

10:30 a.m. 1135-A5-1883   sarah-marie belcastro, "Does Inclusivity Matter in Mathematical Practice?"

Also of interest at the JMM 2018 meeting:

AMS Special Session: *Alternative Proofs in Mathematical Practice*

Saturday, January 13, 2018, 8:00 a.m. to 11:30 a.m., Room 30A, Upper Level, San Diego Convention Center
Organizer: John W. Dawson

8:00 a.m.   (1135-03-2)   John Stillwell, "The Brouwer Fixed Point Theorem"

9:00 a.m.   (1135-01-302) Jemma Lorenat "Algebraic symbols and geometrical reality: the algebraic geometry of Charlotte Angas Scott"

9:30 a.m.   (1135-01-852) Kenneth L Manders "On Proofs of the Quadratic Reciprocity Theorem"

10:00 a.m. (1135-11-173) Roger B. Nelsen "Alternative Proofs in Number Theory"

10:30 a.m. (1135-00-53)   Rebecca Lea Morris "Alternative proof presentations"

11:00 a.m. (1135-03-584) Wilfried Sieg "The Cantor-Bernstein Theorem: How many proofs?"

Joint CSHPM/CPA meeting

The **Canadian Society for the History and Philosophy of Mathematics** will be having its annual meeting jointly with the **Canadian Philosophical Association** next year, June 4–6, 2018, at the Université du Québec à Montréal. Prof. Emily Grosholz from Pennsylvania State University will be the invited speaker.

Participants may present papers related to history of mathematics, its use in teaching mathematics, philosophy of mathematics, and related fields. Graduate students are especially encouraged to present their work. Deadline for submitting a proposed talk, with title and abstract (200 words or less, in Microsoft Word, pdf (non-scanned), or the body of an email) is Feb. 1, 2018.

General session:
Eisso Atzema, eisso.atzema@maine.edu

Special session on History of Philosophy of Mathematics:
Dirk Schlimm, dirk.schlimm@mcgill.edu

Mathfest 2017 featured John Baldwin

by Bonnie Gold

At **MathFest 2017**, **John Baldwin**, Emeritus Professor at the University of Illinois at Chicago, gave the POMSIGMAA invited address, "Philosophical implications of the paradigm shift in model theory." An expanded version of his talk will be published soon as a book, "Formalization without Foundationalism: Model Theory and the Philosophy of Mathematical Practice." Early twentieth century philosophy of mathematics concerned foundations, and logic was an integral part of that work. It sought a common foundation for all of mathematics. After the middle of the century, focus shifted to both traditional philosophical questions (such as the nature of mathematical objects) and, most recently, to the philosophy of mathematical practice.

Baldwin has been working on showing how model theory, a branch of mathematical logic, can contribute to that direction. He characterizes model theorists as "self-conscious mathematicians" who work with structures and formal theories about these structures. Thus it is formalization but not concerning the foundations of mathematics. Model theory focuses on theories, not logics, and looks for "local" foundations that "preserve the ethos of each area" of mathematics. So, for example, Ax gave a model-theoretic proof of a theorem of Grothendieck's that every injective polynomial map on an affine algebraic variety over C is surjective.

"After the paradigm shift there is a systematic search for a finite set of syntactic conditions which divide first order theories into disjoint classes such that models of different theories in the same class have similar mathematical properties. In this framework one can compare different areas of mathematics by checking where theories formalizing them lie in the classification." The (model-theoretic) concept of stability is one that provides such a classification. The model-theoretic concept of categoricity (that a theory has just one model of a given size) implies certain structural properties of the models.

Submit announcements
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Got an announcement of interest to POMSIGMAA? This newsletter comes out twice a year. Contact our Public Information Officer, Kevin Iga kiga@pepperdine.edu.

Buechner slides from JMM 2017 now available

The slides from Jeff Buechner's invited address, "Computers, Mathematical Proof, and the Nature of the Human Mind" at JMM 2017 is now available online. There is a short version
http://sigmaa.maa.org/pom/PomSigmaa/Buechner2017JMM-short.pdf
and a long version
http://sigmaa.maa.org/pom/PomSigmaa/Buechner2017JMM-long.pdf