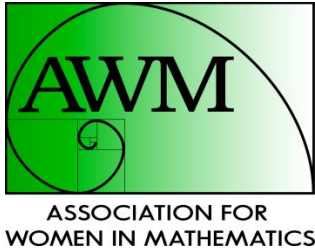*April 23, 2020*

Emily Riehl wins the AWM - Joan & Joseph Birman Research Prize in Topology and Geometry

The Association for Women in Mathematics (AWM) will present the fourth AWM Joan & Joseph Birman Research Prize in Topology and Geometry to **Emily Riehl**, Associate Professor of Mathematics at Johns Hopkins University at the Joint Mathematics Meetings in Washington, DC in January 2021. Established in 2013, the AWM Joan & Joseph Birman Research Prize recognizes exceptional research in topology and geometry by a woman early in her career. The biennial presentation of this prize serves to highlight to the community outstanding contributions by women in the fields of topology and geometry and to advance the careers of the prize recipients. The award is made possible by a generous contribution from Joan and Joseph Birman.

Citation

The 2021 Joan & Joseph Birman Research Prize in Topology and Geometry is awarded to Emily Riehl for her deep and foundational work in category theory and homotopy theory.

Riehl has proved many fundamental theorems in category theory and its relations to homotopy theory and has produced a large body of exceptional research as well as expository and pedagogical work. Her work is transforming the ways we work with higher categorical objects, drawing on classical category-theory tools and constructions to illustrate and simplify higher categorical constructions. Riehl's theorems and machinery beautifully showcase how these higher categorical constructions can often be viewed as intuitive generalizations of the ordinary ones. Her books on category theory and on homotopical

category theory have become the standard references, and her draft book on ∞-categories is already finding immediate use by researchers. Riehl is an internationally recognized scholar for her important research works in category theory and her innovative ideas about mentorship and communication of mathematics.

Photo by Liz Flyntz

Riehl received her PhD in 2011 from the University of Chicago and was a Benjamin Peirce Postdoctoral Fellow and an NSF Postdoctoral Fellow at Harvard University from 2011 to 2015.
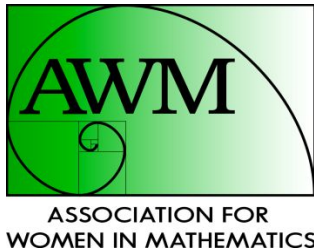
Riehl is currently an associate professor at Johns Hopkins University and is spending the spring term of 2020 as a Chern Professor at the Mathematical Sciences Research Institute in Berkeley where she co-organizes a semester-long program on Higher Categories and Categorification.

Response from Emily Riehl

I am deeply honored to have been selected for the 2021 Joan & Joseph Birman Research Prize in Topology and Geometry and acutely grateful to the selection committee for recognizing higher category theory and abstract homotopy theory as topology metamorphosed.

I am lucky to have fallen in love with mathematics at an early age and even more fortunate to have received such fantastic mentorship at every step along the way. I am particularly grateful to Benedict Gross, who inspired and then catalyzed my undergraduate forays into teaching; Martin Hyland, who roused my aspirations to think categorically; Peter May, my PhD advisor and preeminent editor, who showed me what it takes to write well; Mike Hopkins, who initiated me into the profession and moves me with the kindness he shows to so many who look up to him; and especially to my colleagues at Johns Hopkins who have gone above and beyond time and time again to support me in every conceivable way: Nitu Kitchloo, Jack Morava, David Savitt, and Steve Wilson. Finally, I'd like to acknowledge the generosity of the algebraic topology community, who have drawn me in from the periphery and made me feel as if we were all a part of a common enterprise. For instance, though the wonderful Women in Topology network, I and many others can count the senior luminaries in the field --- Kathryn Hess, Brooke Shipley, Kristine Bauer, and Brenda Johnson --- among my treasured collaborators and friends.

I am excited to be one of many contributors to a field of mathematics that is undergoing a rapid evolution. I like to daydream about what infinite-dimensional category theory will look like from the other side, perhaps where a univalent foundation system allows us to treat equivalence as equality and recognize sets as one layer of an infinite hierarchy of homotopy types, recording the higher structures that may be borne by these equivalences.

The 2021 Joint Mathematics Meetings are currently scheduled for January 6-9, 2021 in Washington, DC. The JMM will take place on location, virtually, or in a hybrid format. Plans may change during these uncertain times. See www.ams.org for updates. For further information on the AWM-Joan & Joseph Birman Research Prize, please visit www.awm-math.org.

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