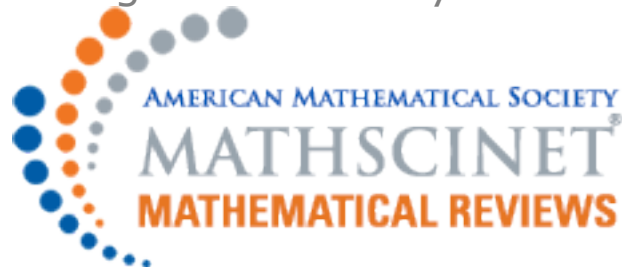




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MR3645425 [Reviewed](#)

Office hours with a geometric group theorist.

Edited by Matt Clay and Dan Margalit. *Princeton University Press, Princeton, NJ*, 2017. xii+441 pp. ISBN: 978-0-691-15866-2

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When an advanced undergraduate (perhaps contemplating graduate school or writing a senior thesis) approaches us and asks us about our research, how do we respond? Perhaps we describe our favorite example, or a simplified account of an accessible theorem. I think that many of us have polished a little talk to give to these students. Of course, a version of that same talk is useful when describing our work to colleagues who work in different fields.

This unique and inspiring book can be viewed as a collection of these introductory lectures on various topics in geometric group theory. A variety of authors were tasked with writing brief accounts of standard examples and techniques in the subject that would be accessible to an undergraduate who had completed a course in abstract algebra. The result is an utterly delightful introduction to the subject. To give a sense as to what is covered, here is the table of contents along with the author of each chapter:

Matt Clay and Dan Margalit, "Groups", 3–20. [MR3587214](#)

Matt Clay and Dan Margalit, "... and spaces", 21–41. [MR3587215](#)

Dan Margalit, "Groups acting on trees", 45–65. [MR3587216](#)

Matt Clay, "Free groups and folding", 66–84. [MR3587217](#)

- Johanna Mangahas, "The ping-pong lemma", 85–105. [MR3587218](#)
- Matt Clay, "Automorphisms of free groups", 106–121. [MR3587219](#)
- Dan Margalit and Anne Thomas, "Quasi-isometries", 125–145. [MR3587220](#)
- Timothy Riley, "Dehn functions", 146–175. [MR3587221](#)
- Moon Duchin, "Hyperbolic groups", 176–202. [MR3587222](#)
- Nic Koban and John Meier, "Ends of groups", 203–218. [MR3587223](#)
- Greg Bell, "Asymptotic dimension", 219–236. [MR3587224](#)
- Eric Freeden, "Growth of groups", 237–266. [MR3587225](#)
- Adam Piggott, "Coxeter groups", 269–290. [MR3587226](#)
- Robert W. Bell and Matt Clay, "Right-angled Artin groups", 291–309. [MR3587227](#)
- Jennifer Taback, "Lamplighter groups", 310–330. [MR3587228](#)
- Sean Cleary, "Thompson's group", 331–357. [MR3587229](#)
- Tara Brendle, Leah Childers and Dan Margalit, "Mapping class groups", 358–383. [MR3587230](#)
- Aaron Abrams, "Braids", 384–417. [MR3587231](#)

The above contains a good chunk of what I would consider the core topics of the field.

There are a few glaring omissions; for instance, neither Kazhdan's property (T) nor lattices in semisimple Lie groups are discussed. These editorial decisions could perhaps be justified by the somewhat higher technical demands of these topics, though I think that e.g. many topics about lattices and symmetric spaces could be elucidated through basic examples like $SL_n(\mathbb{Z})$. These are tiny complaints, however, and are inevitable in a book of finite length.

I personally have already shared this book with several beginning graduate students, and expect that it will become a standard entryway into the field. I would strongly encourage people working in other areas of mathematics to consider writing a book in this style!

REVISED (August, 2019)

Current version of review. [Go to earlier version.](#)

Reviewed by [Andrew Putman](#)

