Set-Theoretic Knowledge: Beyond True and False

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(Tea 4:30 pm Math Lounge)
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(Note different time and format)

Abstract

Modern mathematics is, to my mind, a complex edifice based on conceptual constructions. With its richness, variety, and complexity any discussion of the nature of mathematics cannot but accede to the primacy of its history and practice. The applicability of mathematics may be a driving motivation, but in the end mathematics is autonomous. Mathematics is in a broad sense self-generating and self-authenticating, and alone competent to address issues of its correctness and authority.

What brings us mathematical knowledge? The carriers of mathematical knowledge are proofs, more generally arguments and constructions, as embedded in larger contexts. Mathematical knowledge does not consist of theorem statement, and certainly does not consist of more and more "epistemic access", somehow, to "abstract objects" and their workings. Mathematicians and teachers of higher mathematics know this, but it should be said. Issues about competence and intuition can be raised as well as factors about the general dissemination of analogical or inductive reasoning, but in the end, what can be directly conveyed as knowledge are proofs.

The talk will describe how proofs are the carriers of mathematical knowledge, with the first half devoted to set theory, and the second half, to modern mathematics in general. Some elementary set theory and knowledge of the set theoretic axioms would be helpful for following the first half, but the second half requires little background.

This talk should be accessible to graduate students.