▶ JEREMY AVIGAD, *Formally verified mathematics, in theory and practice.*
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Since early in the twentieth century it has been understood that ordinary mathematical arguments can be formalized in axiomatic systems like Zermelo-Fraenkel set theory or simple type theory. This makes it possible to verify the correctness of a mathematical argument against an explicit list of axioms and rules, at least in principle. Developments in automated reasoning and formal verification have now made it possible to mechanically check nontrivial mathematical proofs, in practice, with interactive proof assistants that use higher-level user input to construct low-level axiomatic derivations.

Within the last few years, a number of notable formalization landmarks have been achieved. Such verification efforts pose a host of theoretical challenges, requiring us to understand ways that robust mathematical knowledge can be communicated, manipulated, and stored, as well as to understand the nature of ordinary mathematical inference. In this talk, I will survey recent developments, emphasizing the central logical ideas on which they are based, as well as the logical problems and challenges they bring to the fore.