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"Toward a formal proof that zeta(3) is irrational"

Abstract:

In 1978, R. Apéry claimed that he had proved the irrationality of zeta(3). The status of this result remained controversial for a couple of months before being validated by the careful proof-reading of his colleagues (see "A proof that Euler missed...", A. Van der Poorten, 1978). However part of the study led by R. Apéry can be automatized by a generic method for the study of hypergeometric identities based on so-called creative telescoping. Efficient algorithms for this method have been studied and implemented in computer algebra systems since the 90's. In this talk, we describe the ongoing formalization of a proof of irrationality of zeta(3) based on the interaction of the Coq proof assistant with the Maple computer algebra system. This is a joint work with Frédéric Chyzak (Inria) and Thomas Sibut-Pinote (ENS Lyon).