

# How a Hard Conjecture in Number Theory was Knocked out with Symbolic Analysis

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We report on a proof of the famous qTSPP conjecture in partition theory, recently obtained in a collaboration with Christoph Koutschan (RISC) and Doron Zeilberger (Rutgers).

The qTSPP conjecture, posed by Andrews and Robbins around 1982, is a formula for counting certain integer partitions. It became famous as the last unsolved problem on Stanley's list of conjectures on plane partitions.

Okada had pointed out that in order to prove the qTSPP conjecture, it suffices to prove a certain determinant identity. Using computer algebra, this determinant identity in turn can be reduced to a horrendous summation identity (300Mb in size), and, again making extensive use of computer algebra, an even more horrendous summation certificate (7Gb in size) could finally be constructed for this identity.

Our proof appeared a few months ago in the Proceedings of the National Academy of Science and also attracted the attention of several German-speaking public media.