Einladung

zum Vortrag im Rahmen des **SFB Colloquiums** (Standort Linz), mit dem Titel

A bite of symbolic computation - proving and producing Jacobi theta function identities automatically

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Abstract: Theta function identities play an important role in several branches of mathematics and physics, e.g., combinatorics, number theory, particle physics and string theory. For instance, by using some theta function identities, Rademacher derived the formula for the number of presentations of a natural number as a sum of 10 squares. Another example is that Ramanujan used theta function identities to derive formulas for the evaluation of pi. Until now, many mathematicians are still working on refining the evaluation of pi. In the past centuries, many number theorists, e.g., Ramanujan, Hardy, Rademacher, Berndt, Borwein, etc., have proved a substantial amount of theta function relations by hand. There was no general method for proving such relations, and the computation in their proofs are usually tedious.

Thanks to symbolic computation, now we have developed some computer algebra algorithms to prove and produce rich classes of such identities automatically. In this talk, I will present a nutshell of our research on proving and producing theta function identities. I will also demonstrate a Mathematica package called "ThetaFunctions" equipped with our algorithms.