

# Boğaziçi MATH COLLOQUIUM

## The concrete tetrahedron in algorithmic combinatorics

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**Abstract:** Donald Knuth introduced a course “Concrete Mathematics” that has been taught annually at Stanford University since 1970. The course, and the accompanying book coauthored with Ron Graham and Oren Patashnik, was originally intended as an antidote to “Abstract Mathematics.” In the 1990s, Doron Zeilberger’s “holonomic systems approach to special functions identities” inspired a further wave in this “concrete evolution”: the development of computer algebra methods for symbolic summation, generating functions, recurrences, and asymptotic estimates. The book “The Concrete Tetrahedron,” by Manuel Kauers and the speaker, describes basic elements of this tool-box and can be viewed as an algorithmic supplement to “Concrete Mathematics” by Graham, Knuth, and Patashnik. The talk introduces to some of these methods. A major application concerns the computer-assisted evaluation of relativistic Coulomb integrals, joint work with Christoph Koutschan and Sergei Suslov.

**Date :** Wednesday, February 25, 2015

**Time:** 2pm

**Place:** TB 250, Boğaziçi University