Speaker : Hans–Jürgen Prömel
May 8th, 8:30

Large numbers, Knuth's arrow notation, and Ramsey theory

If we trust the Guiness Book of Records, "The largest number ever used in a mathematical proof is a limit number which was published in 1977 and is now known as Graham's number" (Guiness Book of Records '98). The Guiness Book continues "This number appears in the investigation of two–colored hypercubes and can only be expressed using the arrow notation which Knuth invented in 1976." Mathematically speaking, Graham's number is an upper bound for the partition (Ramsey) number of two–colorings of so–called Hales–Jewett cubes.
After some historical remarks, this talk will provide a short introduction to the colorful world of Ramsey numbers. New bounds on some Ramsey numbers will be presented, *e.g.* Kim's lower bound on $R(3,t)$ for which he was awarded the prestigious Fulkerson prize. Finally, we will learn about the power of Knuth's arrow notation and the size of Graham's number. Towards the end of the talk we show how Ramsey theory gives rise to numbers which dwarf all those that were previously mentioned.