



Berlin  
Mathematical  
School

# BMS Friday Colloquium

Friday 3 December 2010 at 14:15

*Tea before lecture begins at 13:00*

BMS Loft, Urania, An der Urania 17, 10787 Berlin

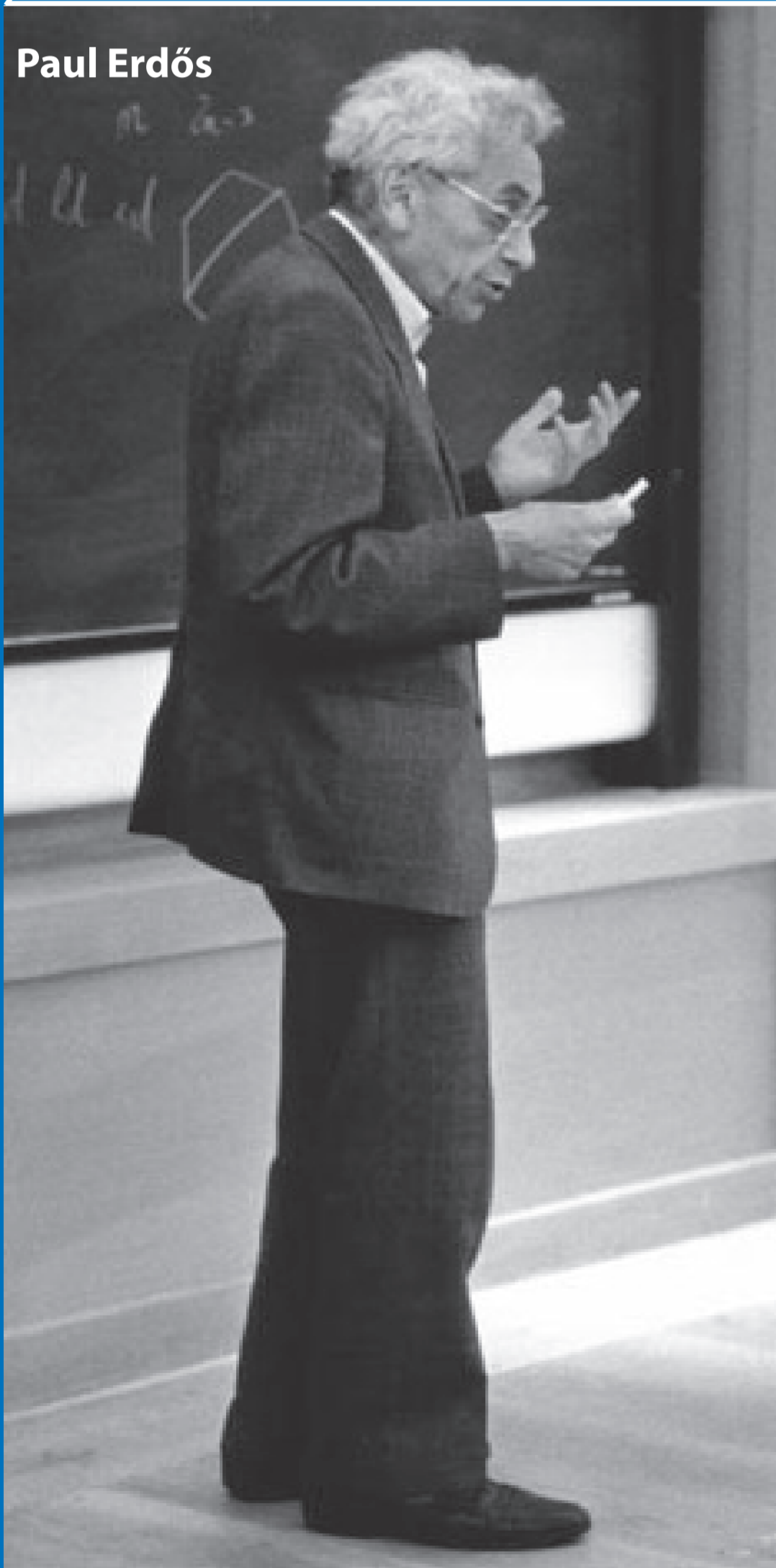


## Joel Spencer

*(Courant Institute)*

### Der Zauberer von Budapest - Paul Erdős and the Rise of Discrete Mathematics

Paul Erdős



The twentieth century saw the elevation of Discrete Mathematics from "the slums of topology" (one of the more polite expressions!) to its current highly regarded position in the mathematical pantheon. Paul Erdős played a key role in this transformation. Joel Spencer will discuss some key results, possibly including:

- i)** Ramsey Theory. In 1946 Erdős showed that you could two-color the complete graph on  $n$  vertices so as to avoid a monochromatic clique of size  $k$ , where  $n$  was exponential in  $k$ . To do it, he introduced the Probabilistic Method.
- ii)** Random Graphs. In 1960 Erdős, with Alfréd Rényi, showed that the evolution of the random graph undergoes (in modern language) a phase transition when the number of edges approaches half the number of vertices.
- iii)** Number Theory. In 1940 Erdős, with Marc Kac, showed that the number of prime factors of  $n$  satisfies (when appropriately defined) a Gaussian distribution. Amazing!

Anecdotes and personal recollections of Paul Erdős will be sprinkled liberally throughout the presentation.

Joel Spencer is one of the many disciples of Paul Erdős. He began working with Uncle Paul, as Erdős was universally referred to, while still a graduate student and they collaborated for thirty years. Spencer's books include "Ramsey Theory" and "The Probabilistic Method," both areas in which Erdős's work was paramount. He was a cofounder of the journal "Random Structures and Algorithms." He holds a joint appointment as Professor of Mathematics and Computer Science at the Courant Institute in New York. He is the recipient of two Erdős awards, for ten and one hundred dollars respectively. And, yes, his Erdős number is one.