

University of Florida • Mathematics Department
15th Erdős Colloquium

by

János Pintz*

MTA Rényi Institute, Budapest, Hungary

on

*On Some Old Conjectures of Paul Erdős on the
Difference of Consecutive Primes*

Date and Time: 4:00 - 5:00pm, Monday, March 16, 2015

Room: MAT 018

Opening Remarks: Doug Cenzer, Math. Dept. Chair

Refreshments: after the lecture in Little 339 (Atrium)

About the speaker:

* János Pintz is a fellow of the Rényi Mathematical Institute and a member of the Hungarian Academy of Sciences. His research is in Analytic Number Theory. He has written over 100 papers including 30 papers on irregularities in the distribution of primes. He gave the first effective disproof of the Mertens Conjecture. He was awarded the 2014 AMS Cole Prize with Goldston, Yıldırım and Zhang for their work on small gaps between primes.



Abstract: Paul Erdős wrote more than 1600 papers. The MathSciNet contains reviews of 1425 works of Erdős. Out of these 1425 papers nearly every fifth, in total 272 papers contain the word prime in the review. Besides dealing with the most central problems concerning primes – as the elementary proof of the Prime Number Theorem, for example – he was especially interested in unconventional problems dealing with primes, like questions about the difference of consecutive primes. The reason why these problems were considered unconventional and why they did not belong to mainstream prime number theory was not that they were of marginal interest but that in most cases no known methods existed for the solution or even investigation of these. The general situation could have been described briefly in the way that there were many interesting questions and nearly no answers. After the dramatic break-through of Y. Zhang, J. Maynard and T. Tao in the last two years, which yielded infinitely many bounded gaps between primes (and which were based on the results of Goldston, Yıldırım and the lecturer, proved in the last ten years), these new methods opened the way to many 40-80 year old conjectures by Erdős about the difference of consecutive primes which were earlier considered completely inaccessible by using existing methods. (In many cases partial results were proved by Erdős himself, in several of these cases together with Paul Turán, and in some cases by others, for example, simultaneously by Ricci and Rankin.) In the lecture a survey will be given about the origin, history and recent results concerning these problems (reached mostly in the last two years, in some cases in the last few months). The most famous of these problems refers to the existence of large gaps between consecutive primes (the so called Erdős-Rankin problem) for which 36 years ago Erdős offered a \$10,000 USD prize, the highest prize ever offered by him for any mathematical problem.