Lethbridge Number Theory and Combinatorics Seminar

Monday — April 9, 2018
Room: B543
Time: 12:00 to 12:50 p.m.

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Values of arithmetic functions at consecutive arguments

Abstract: We shall place in a general context the following result recently (*) obtained jointly with Yuri Bilu (Bordeaux), Sanoli Gun (Chennai) and Florian Luca (Johannesburg).

Theorem. *Let $\tau(\cdot)$ be the classical Ramanujan τ-function and let k be a positive integer such that $\tau(n) \neq 0$ for $1 \leq n \leq k/2$. (This is known to be true for $k < 10^{23}$, and, conjecturally, for all k.) Further, let σ be a permutation of the set $\{1, \ldots, k\}$. We show that there exist infinitely many positive integers m such that*

$$\big|\tau\big(m + \sigma(1)\big)\big| < \big|\tau\big(m + \sigma(2)\big)\big| < \cdots < \big|\tau\big(m + \sigma(k)\big)\big|.$$

The proof uses sieve method, Sato-Tate conjecture, recurrence relations for the values of τ at prime power values.

(*) Hopefully to appear in 2018.

EVERYONE IS WELCOME!

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