Brownsville Seminar

UTRGV
School of Mathematical & Statistical Sciences

Equivalent formulations of the Riemann hypothesis and their numerical analysis

Speaker: Oleg Musin

Abstract: The Riemann hypothesis (RH) is equivalent to many other conjectures about the rate of growth of some arithmetic functions. A typical example is Robin's theorem about the sum of divisors function sigma(n). In 1915, Ramanujan proved asymptotic inequalities for sigma(n) that is equivalent to the RH.

In this talk I will show our joint results of computation of CA numbers that leverages interval arithmetic and high precision libraries to verify Ramanujan's theorem. Note that the asymptotic relation that Ramanujan claimed does not hold in the range of numbers that our group of collaborators computed, and functions that he predicted to converge seem to diverge on the range of numbers available to us. I will present our estimate for the constant value in his asymptotic, while allowing the doubt of the result, since several computational errors were found in Ramanujan's paper before. I will also compare my work with the recently written papers by Nicolas, who proved a lower bound inequality stronger than Ramanujan's, and hence show a possibility for improving the lower bound.

Date: Friday, September 27
Talk Time: 2:00PM–3:00PM
Where: BLHSB 1.316 and in Zoom (LINK)

Coffee and Cookies will be provided!

For further information or for special accommodations, please contact Dr. Alexey Glazyrin via email alexey.glazyrin@utrgv.edu. More information about the seminar talks is available at the website https://www.utrgv.edu/math/news-events/seminars/brownsville/index.htm.