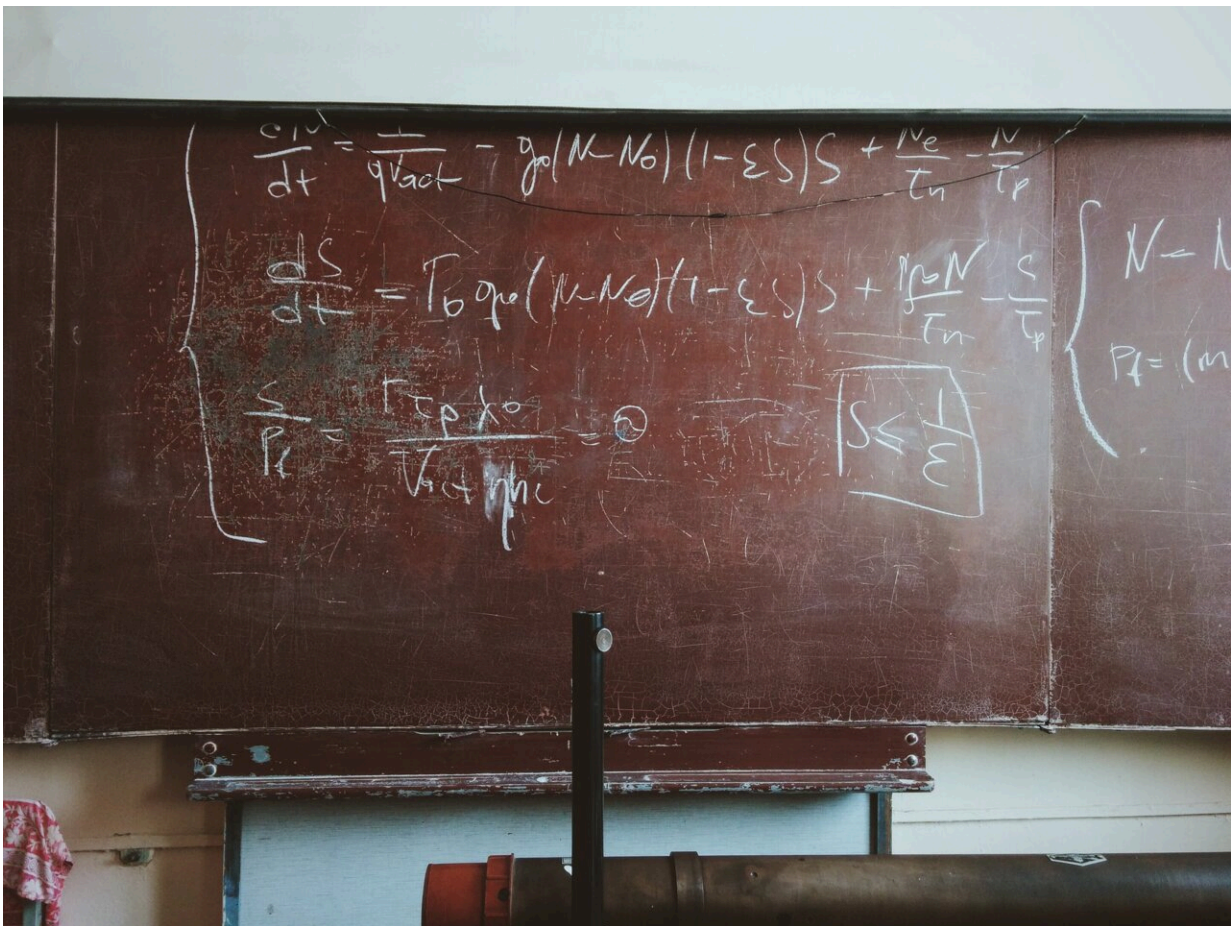# Number theorist may have proposed a solution to the Landau-Siegel zeros conjecture

November 15 2022, by Bob Yirka

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Yitang Zhang, a number theorist at the University of California, Santa Barbara, has posted a paper on arXiv that hints at the possibility that he may have solved the Landau-Siegel zeros conjecture. The paper has not yet been validated by anyone else at this time, and Zhang himself has yet to explain the purpose or even meaning of his paper.

The paper posted by Zhang is not in a traditional format. There is no introduction or summation, or even any sort of explanation of its contents. Instead, it is a proof—a very long proof, 111 pages of math. Zahn does imply that his work is related to the Landau-Siegel zeros conjecture, however, and also implies in the title that it involves discrete estimates. The Landau-Siegel zeros conjecture is a sort of potential counterexample to the Riemann Hypothesis, which is theorized to predict the probability that numbers in a certain range are prime numbers.

Zhang is considered to be somewhat of an eccentric person. He was born and raised in China, and earned a master's degree at Peking University. He then moved to the United States where he earned a Ph.D. in math at Purdue University. But for unknown reasons, he was unable to get a job in his field, instead working a variety of menial labor jobs until finally landing a position at the University of New Hampshire. While there, Zhang toiled away on his own time for several years and then published what he'd been working on in 2013—the twin prime conjecture, which proposed that there are infinite pairs of prime numbers that differ by two.

The paper was considered a major breakthrough and made Zhang a celebrity of sorts in the math world. He has apparently been working on the Landau-Siegel zeros conjecture for many years. In 2007, he posted a paper about it as a preprint, but there were problems with the work, and it was never published in a peer-reviewed journal.

It will likely be some time before others finish reviewing Zhang's paper and offer commentary. And it is not clear if Zhang himself will comment publicly, although he is scheduled to present his paper to colleagues at Peking University sometime in the near future.

More information: Yitang Zhang, Discrete mean estimates and the Landau-Siegel zero, *arXiv* (2022). DOI: 10.48550/arxiv.2211.02515