Twin Prime Conjecture

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Source

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The twin prime conjecture appeared to be invincible through the years. Top mathematicians like Hardy and his colleague Littlewood, among others, couldn't beat it during their whole career. Nevertheless, they achieved substantial advances that made the conjecture more famous and more tempted to prove. Even Erdős himself, famous for solving difficult problems, was engaged in solving this conjecture. This conjecture states that there are infinitely many primes separated by a gap of 2: for example, 3 and 5, 5 and 7, 11 and 13, etc. In ancient Greece, Euclid showed that there are infinitely many prime numbers, so it was not discarded that the twin prime conjecture was also true. In April 2013, the Chinese-American Yitang Zhang announced that there are at least infinitely many primes separated by a gap of 70 million. This shocked everyone, since Yitang used one of the most difficult methods to achieve his result (he made an improvement to the Goldston–Graham–Pintz–Yıldırım result) and he was also considered as an "unknown" number theorist in the international community of mathematicians at the time. Months later, a young man named James Maynard achieve to bound the gap to 600: this mathematician received the Fields medal in 2022 for this achievement and other contributions he made after it. Immediately, the best mathematicians in the world got together under the Polymath Project led by Terence (Terry) Tao who is one of the best current active mathematicians. In a joint effort over months they brought the gap down to 246 and since then, no significant progress has been made beyond. The author, using a site (Wolfram Alpha) that links artificial intelligence and mathematics, achieved a calculation that concludes after certain arithmetic steps that the twin prime conjecture is actually true (i.e. he reduced the current gap from 246 to the minimum, which is 2, ending the quest to improve the result).