1096-11-2337 **Andrew Granville*** (andgranville@gmail.com), University de Montreal, Pavillon Aisenstadt, Dept de mathematiques et de statistiques, CP 6128 Succursale Centre-Ville, Montreal, Quebec H3C 3J7, Canada. *Infinitely many pairs of primes differ by no more than 70 million (and the bound's getting smaller every day).*

One of the most famous problems about primes is the twin prime conjecture, which states that there are infinitely many pairs of primes that differ by 2. This is a strange problem in that primes are, by nature, a multiplicative construct (those numbers that are not the product of two other numbers > 1), whereas the twin prime conjecture asks about their additive structure. Perhaps this is what makes it so intriguing to amateur and professional mathematicians alike, yet professional mathematicians have mostly been deterred from working on it since they did not seem to have adequate tools to even formulate a plan to resolve the problem.

This all changed with the breakthrough paper of Goldston, Pintz and Yildirim (2009) who showed that if the primes are well enough distributed in arithmetic progressions then there are pairs of primes that differ by at most 16. At the time their proposed estimate seemed far off, yet last summer Yitang Zhang proved an estimate which, although weaker than proposed, still implies that there are infiniitely many pairs of primes that differ by no more than a certain given bound.

In this talk we will discuss the proof of this extraordinary result, and subsequent developments by a "polymath" project. (Received September 17, 2013)