NUMBER THEORY AND MATHEMATICAL PHYSICS: APPLYING "APPLIED MATH" TO THE "PUREST" OF "PURE MATH"

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Abstract. Number theory consists of the mathematics that has been developed over the ages to answer seemingly simple questions about ordinary counting numbers, questions like, "Is it possible to find counting numbers a, b, and c such that $a^2 + b^2 = c^2$? What about $a^n + b^n = c^n$?" or "Are there infinitely many 'twin' primes, i.e. primes like 5 & 7 or 11 & 13 that have only one even number between them?" Given the simplicity of the questions, it is perhaps surprising that some of their answers have been persistently elusive. The methods employed to answer number theoretic questions are both diverse and deep. In this talk I will discuss the application of ideas in mathematical physics (both classical and quantum) to questions in number theory.

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