polynomials over finite fields.
The prime numbers are the source of many unsolved problems in classical number theory. Three well-known examples are the twin prime conjecture about prime pairs $\{p, p+2\}$, Euler's conjecture (popularized by Landau) that there are infinitely many primes of the form $n^{2}+1$, and the Goldbach conjecture concerning prime pairs $\{p, N-p\}$ where $N \geq 4$ is even. We report on what is known about problems of this shape if the ring of rational integers is replaced by the ring of (univariate) polynomials over a finite field. Some of this is joint work with Andreas Bender of the Korea Institute for Advanced Study. (Received August 25, 2009)

