Growing connections between partition crank, mex, and Frobenius symbols

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Abstract: The crank is a well-known statistic of integer partitions: requested by Dyson and eventually defined by Andrews and Garvan, it helps explain the Ramanujan partition congruences. The mex is a newer statistic, the minimal excluded positive part of a partition, with the name borrowed from combinatorial game theory. The first connection between these ideas, found independently by Andrews & Newman and Hopkins & Sellers in 2020, is that the number of partitions of n with nonnegative crank equals the number of partitions of n with odd mex. This has led to a flurry of related results, including connections to Frobenius symbols, proven with both analytic and combinatorial methods. The work presented here is joint with James Sellers, Dennis Stanton, and Ae Ja Yee.