Abstract:
A famous result in partition theory is Ramanujan's congruences, that the number of partitions of $5n+4$ is divisible by 5, those of $7n+5$ divisible by 7, and those of $11n+6$ divisible by 11. These are now understood as members of an infinite family of such congruences, unified by the symmetries of modular forms. More recent work has been devoted to finding congruences for the $m$-regular partitions, those in which parts may not be divisible by $m$. These are now numerous, but we do not yet have a similar unifying structure. This talk will outline each of these ideas, demonstrate that it is now fairly easy to prove many conjectured congruences with current techniques, and lay out a few ideas, tentative as yet, for constructing such general theorems.