The Sato-Tate Conjecture
by Richard Taylor

Abstract:

In the first part of the talk I will explain the Sato-Tate conjecture and the Tate-Serre approach via symmetric power L-functions. I will also sketch the structure of the recent proof (by Laurent Clozel, Michael Harris, Nick Shepherd-Barron and myself) of the conjecture for elliptic curves over $\mathbf{Q}$ with somewhere multiplicative reduction.

In the second part of the talk I will explain a recent improvement to the Wiles/Taylor-Wiles method for proving modularity. This bypasses the level raising arguments of Wiles' Fermat Last theorem paper and hence bypasses Ihara's lemma. These were the last obstacles to generalising Wiles/Taylor-Wiles modularity results to higher rank unitary groups and hence to proving the Sato-Tate conjecture.