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Neil Dummigan and **Dan Fretwell*** (daniel.fretwell@bristol.ac.uk). (*Real Quadratic*)
Arthurian Tales.

In recent years there has been a lot of interest in explicitly identifying the global Arthur parameters attached to certain automorphic forms. In particular Chenevier and Lannes were able to completely identify and prove the full lists of Arthur parameters in the case of level 1, trivial weight automorphic forms for definite orthogonal groups of ranks 8, 16 and 24 (not a simple task!). One finds interesting modular forms hidden in these parameters (e.g. Delta and a handful of special Siegel modular forms of genus 2) along with information on the degrees of non-vanishing of certain linear combinations of Siegel theta series. Comparing Arthur parameters mod p proves/reproves various Eisenstein congruences for these special modular forms, e.g. the famous 691 congruence of Ramanujan and, more importantly, an example of a genus 2 Eisenstein congruence predicted by Harder (which, up to then, had not been proved for even a single modular form!).

In this talk I will discuss recent work with Neil Dummigan on extending the above to definite orthogonal groups over certain real quadratic fields and try to tell the analogous Arthurian tales (mysteries included). (Received September 02, 2020)