

## Fifth annual conference of the SFB-TRR 195

Thursday, Sept 16, 12:20 pm

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### **Nilpotent Pieces of Lie Algebras of Type $G_2$ and $F_4$ in Bad Characteristic**

Let  $G$  be a connected reductive algebraic group over an algebraically closed field  $k$ , and let  $\mathfrak{g}$  be its Lie algebra. The partition of the unipotent variety of  $G$  defined by George Lusztig in his papers *Unipotent elements in small characteristic I-IV* is very useful when working with representations of  $G$ . Alternatively, one can consider certain subsets of the nilpotent variety of  $\mathfrak{g}$  called pieces. This approach also appears in *Unipotent elements in small characteristic III* where the pieces in good characteristic (for all types) and for classical groups (in every characteristic) have already been computed.

However, it is not yet known what the pieces for the exceptional groups  $G_2$ ,  $F_4$ ,  $E_6$ ,  $E_7$ ,  $E_8$  in bad characteristic are and whether they form a partition of the nilpotent variety as is the case in good characteristic.

This talk will give an introduction to the theory of the nilpotent pieces and give some context for the unknown cases. Moreover, the solution for the pieces in type  $G_2$  and  $F_4$  in bad characteristic will be presented