ALGEBRA SEMINARS

Partial categories -- a proposal for constructing orbit categories of saturated fusion systems

By

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Abstract: Given a finite group G the orbit category of G consists of all transitive G-sets and equivariant maps between them. Aside from algebra the orbit category has also proved very useful in topology for describing G-equivariant homotopy theory. For a saturated fusion system/p-local finite group F with Sylow subgroup S the existing constructions of an orbit category of F only makes sense for subgroups of S that are "sufficiently large". In this talk I will propose a construction of an orbit category for F that works for all subgroups of S, but the result will be a "partial" category (to be defined during the talk) that only allows some compositions of morphisms. The construction builds upon the theorem of Andy Chermak that a saturated fusion system is always realized by a (suitably unique) partial group -- and Chermak's concept of a partial group will be a special kind partial category.
Every partial category can be seen to give rise to a actual category enriched in simplicial sets via a very explicit procedure, and we shall see that the proposed orbit category restricts to a classical category when considering "sufficiently large" subgroups of S and that we recover the old definition of an orbit category for F. This joint project with Rémi Molinier is very much a work in progress, and as such the talk will contain many more conjectures than theorems (with exception of the previous line).

Date: December 3, 2018
Time: 10:40 – 11:50
Place: SA141 Mathematics Seminar Room

* Tea and cookies will be served before the talk. All are most cordially invited.