MANY CHEERFUL FACTS

presents

Examples of Nonabelian Von Neumann Algebras via the Group Measure Space Construction,

or Semidirect Product : Groups :: Group Measure Space Construction : Von Neumann Algebras

a talk by Dave Pennys

1:10 - 2:00pm on Thursday, September 13, in room 1015.

Abelian Von Neumann algebras acting on a separable Hilbert spaces are boring. Each one is isometrically-*-isomorphic to $L^\infty(X,\mu)$ for some $X \subseteq \mathcal{C}$. If μ is a finite, regular Borel measure on a locally compact Hausdorff space X, a group G of bijections of X can be considered as a group of automorphisms of the abelian Von Neumann algebra $L^\infty(X,\mu)$ in a natural way. If the group acts nontrivially, we can use the group measure space construction as a recipe for creating the nonabelian Von Neumann algebra $L^\infty(X,\mu) \rtimes G$ from $L^\infty(X,\mu)$, much like we use the semi-direct product of groups to construct a nonabelian group from abelian ones. This is most excellent as it cooks up a myriad of nontrivial examples of nonabelian Von Neumann algebras, even factors.

I am the very model of a modern Major General,
I've information vegetable, animal, and mineral,
I know the kings of England, and I quote the fights historical
From Marathon to Waterloo, in order categorical;
I'm very well acquainted, too, with matters mathematical,
I understand equations, both the simple and quadratical,
About binomial theorem I'm teeming with a lot o' news,
With many cheerful facts about the square of the hypotenuse!

- Gilbert & Sullivan $P \circ P$

The website for Many Cheerful Facts is
http://www.math.berkeley.edu/∼slofstra/mcf