QUANTUM HOMOTOPY GROUPS

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An open-closed tqft is a tqft with a choice of boundary condition. Example: the sigma model for a sufficiently finite space, with its Neumann boundary. Slogan: every open-closed tqft is (sigma model, Neumann boundary) for some "quantum space". In this talk, I will construct homotopy groups for every such "quantum space" (and recover usual homotopy groups). More precisely, these "groups" are Hopf algebras in some category. Given a "quantum fibre bundle" (a relative open-closed tqft), I will construct a Puppe long exact sequence. Retracts in 3-categories and a higher Beck–Chevalley condition will make cameo appearances. This project is joint work in progress with David Reutter.