

## Complete Topological Quantization of Higher Gauge Fields

Urs Schreiber

After global completion of higher gauge fields (as appearing in higher-dimensional supergravity) by proper flux quantization in extraordinary nonabelian cohomology, the (non-perturbative, renormalized) topological quantum observables on solitonic field histories are completely determined as soon as the (globally hyperbolic) spacetime has an uncompactified M-theoretic fiber: They are given by the open string topology of the moduli space of quantized solitonic charges on any Cauchy surface (for the ends of the M-fiber attached to the 0-brane of vanishing charges). In the instructive example of 5D Maxwell-Chern-Simons theory (the gauge sector of 5D SuGra) flux-quantized in Cohomotopy and dimensionally reduced to 3D, this recovers fine detail of the traditionally renormalized (Wilson loop) quantum observables of abelian Chern-Simons theory and makes novel predictions about anyons in (anomalous) fractional quantum Hall systems. The analogous global completion of 11D higher Maxwell-Chern-Simons theory (the higher gauge sector of 11D SuGra) realizes various aspects of the topological sector of the conjectural “M-theory” and its M5-branes. Talk notes may be found at:  
[ncatlab.org/schreiber/show/Complete+Topological+Quantization](http://ncatlab.org/schreiber/show/Complete+Topological+Quantization)