1046-57-1025   **Carmen L Caprau*** (`ccaprau@csufresno.edu`), Department of Mathematics, 5245 North Backer Avenue M/S PB108, Fresno, CA 93740. *Twin TQFTs and Frobenius algebras.*

We study the category of *singular 2-cobordisms* (these are 2-dimensional cobordisms with seams) and give a description of it in terms of generators and relations. We also introduce a special sort of 2-dimensional "twin" Topological Quantum Field Theories (TQFTs). A twin TQFT is defined on singular 2-cobordisms, and is equivalent (as a symmetric monoidal category) to a "twin Frobenius algebra" in a monoidal category. A twin Frobenius algebra (C, W, z, z^*) consists of two commutative Frobenius algebras C and W, and an algebra homomorphism $z : C \to W$ with dual $z^* : W \to C$, subject to some conditions. It follows that the category of singular 2-cobordisms admits an algebraic description as the free monoidal category on a twin Frobenius algebra.

The category of singular 2-cobordisms has strong connections to the $sl(2)$ link cohomology via webs and foams modulo local relations. (Received September 13, 2008)

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