1058-57-224 **Uwe Kaiser*** (kaiser@math.boisestate.edu), Department of Mathematics, 1910 University Drive, Boise, ID 83725-1555. *Commutative Frobenius Algebras and 3-dimensional Compression Bordisms.* Preliminary report.

Given a commutative Frobenius algebra V over a commutative ring R with 1 we construct certain $V^{\otimes j}$-module categories $V[j]$ for $j \geq 0$. Let (M, α) be an oriented 3-manifold with a closed oriented 1-manifold α in its boundary. Then there are defined natural functors from a category of oriented surfaces in M bounding α and morphisms defined by *compression bordisms in* $M \times I$, taking values in $V[|\alpha|]$. (Here a compression bordism $S_1 \to S_2$ is a 3-dimensional manifold with corners, properly embedded in $M \times I$, which is a product over α, and with only embedded 2-handles and 3-handles attached to $S_1 \times I$, considered up to isotopy through those bordisms). The colimit of this functor is the Bar-Natan skein module defined for (M, α) and the Frobenius algebra V. Moreover, a glueing theorem can be proven for this functor. The above construction can be twisted with a $(3+1)$-dimensional TQFT over R to define functors on a category with the morphisms embedded in oriented 4-manifolds. We discuss the above constructions and some conjectures related to it. (Received February 15, 2010)