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Uwe Kaiser* (kaiser@math.boisestate.edu), Department of Mathematics, Boise State University, 1910 University Drive, Boise, ID 83725-1555. *Bar-Natan modules and tunneling graphs*. Preliminary report.

We describe a general method for presentations of colimit modules of functors into module categories. This is applied to the Bar-Natan functor, which is defined on a category of surfaces embedded in a 3-manifold M with morphisms defined by certain 3-manifolds embedded in $M \times [0, 1]$ and takes values in a category of modules defined from a commutative Frobenius algebra. The colimit of the Bar-Natan functor is the Bar-Natan module of M . Our approach naturally leads to the definition of the tunneling graph of M , which contains the geometric data necessary to deduce the structure of the Bar-Natan module. (Received March 07, 2011)