Title:
Calculating with small cell kO and tmf modules

Abstract:
Given an E-infinity ring spectrum, its module category has cell objects and these can be utilised to do calculations in a similar way to classical cell complexes for spaces and spectra. There is also an analogue of the Adams spectral sequence based on a homology theory represented by a module.

At the prime 2, the spectra kO and tmf both provide testing grounds for these techniques. The first case leads to consideration of modules over the subalgebra A(1) of the Steenrod algebra generated by Sq^1 and Sq^2, essentially leading to the same ideas as in Mahowald's `bo-resolutions' technology; the second case is more speculative and I will show how to use doubling to import constructions from the kO/A(1) setting to tmf cell modules as A(2)-modules.