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Ross Geoghegan*, ross@math.binghamton.edu. *$\mathbb{Z}G$ -modules over $CAT(0)$ spaces*. Preliminary report.

Let G be a group acting by isometries on a proper $CAT(0)$ space M and let A be a finitely generated $\mathbb{Z}G$ -module. I will describe a theory of horospherical limit points of A in the boundary of M which Robert Bieri and I have been developing. In this short talk I'll indicate: (1) how the resulting geometry throws light on when A is finitely generated over $\mathbb{Z}K$ where K is an appropriate subgroup of G ; and (2) how the whole theory extends to the non-positively curved world some of the ingredients of “tropical geometry”, specifically the so-called “Gröbner fan”. (Received June 23, 2011)