

## Big polygon spaces and syzygies in equivariant cohomology

**Matthias Franz**

University of Western Ontario, Canada  
[mfranz@uwo.ca](mailto:mfranz@uwo.ca)

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Polygon spaces are configuration spaces of polygons with prescribed edge lengths. We present a related family of compact orientable manifolds, called big polygon spaces. They come with a canonical torus action, whose fixed point set is a polygon spaces. Big polygon spaces are particularly interesting because they provide the only known examples of maximal syzygies in equivariant cohomology. We therefore review the theory of syzygies in equivariant cohomology and its relation to the equivariant Poincar pairing and the "GKM method". We finally discuss possible relations between the syzygy order and the dimension of the manifold.