

# The Oliver Club

[www.math.cornell.edu/~oliver/](http://www.math.cornell.edu/~oliver/)

## ***High-Dimensional Group Cohomology***

*The subgroup  $G$  of  $GL_2(\mathbf{Q})$  generated by the diagonal matrix  $\text{diag}(-1, 1)$  and the upper unitriangular matrix is interesting because for all sufficiently large  $n$ , the  $n$ th cohomology of  $G$  is isomorphic to the  $n$ th cohomology of one of its subgroups of order 2. We can conclude that the high dimensional cohomology satisfies many strong finiteness conditions even though  $G$  is infinitely generated. The example was my starting point on a journey to high dimensional cohomology and how it influences group structure. We shall explore finiteness conditions on individual cohomology functors  $H^n(G, \mathbb{Z})$ . As  $n$  varies we shall see that typically these finiteness conditions are satisfied almost always or almost never. This leads to a dichotomy amongst linear and soluble groups (more generally LHF-groups) and raises many unsolved questions. Much of the technical advances have been made in this study by Martin Hamilton.*



**Peter Kropholler**

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Refreshments will be served at 3:55 PM in the Mathematics Department lounge (532 Malott Hall).

**Thursday, March 29, 2007**  
**at 4:25 PM in 406 Malott Hall**