

# Using Polyhedral Computations to Understand the Geometry and Topology of $G$ -Varieties

Matthias Franz

`matthias.franz@ujf-grenoble.fr`

*Cramer-Klett-Str. 2*

*Neubiberg, Bayern 85579*

*GERMANY*

## **Abstract**

We present the Maple package Convex together with some applications. Due to the integration in a computer algebra system, Convex allows to easily combine polyhedral computations with other kinds of calculations. We illustrate this by examples coming from Algebraic Geometry and Representation Theory. More specifically, we describe how Convex has been applied beneficially to problems related to the cohomology of toric varieties and to the moment polytope of algebraic  $G$ -varieties.