1086-53-1002 **Wyatt Howard*** (whoward@ucsc.edu), University of California Santa Cruz, Department of Mathematics, 4111 McHenry, Santa Cruz, CA 95064, and **Alex Castro** (alex.castro@mat.puc-rio.br), Departamento de Matemática, Rua Marquês de São Vicente, 225-Edifício, Cardeal Leme, sala 862, Rio de Janeiro, 22453-900, Brazil. *A Monster Tower Approach to Goursat Multi-Flags.*

In this talk I will consider the problem of classifying the orbits within a tower of fibrations with $\mathbb{P}^2$-fibers that generalize the Monster Tower due to Montgomery and Zhitomirskii. The action on the tower is given by prolongations of diffeomorphism germs of 3-space called symmetries. Montgomery and Zhitomirskii have pointed out that the classification problem of points within the Monster Tower up to symmetry is equivalent to the classification problem for Goursat 2-flags. Goursat 2-flags arise in the study of dynamical systems. More specifically, the n-rigid bar system as well as F. Jean's car with n-trailers are known examples. I will present the first steps towards the problem of classifying Goursat 2-flags of small length. In short, I will outline the classification of the orbits within the first four levels of the Monster Tower. (Received September 17, 2012)