1084-14-73 **Zsolt Patakfalvi*** (pzs@math.princeton.edu). *Semi-positivity in positive characteristics.*

Results of Griffiths, Fujita, Kawamata, Viehweg, Kollár, etc. stating semi-positivity of relative canonical bundles and of the pushforwards of their powers were crucial in the development of modern algebraic geometry. Most of these results required the characteristic zero assumption, partially due to the use of Hodge theory. In this talk I present semi-positivity results in positive characteristics. The main focus is moduli theoretic situations, in which the best known results in positive characteristics were for families of stable curves by Szpiro and Kollár and for K3 surfaces by Maulik. I present results for arbitrary fiber dimensions allowing sharply F-pure (char p equivalent of log canonical) singularities and semi-ample or ample canonical sheaves for the fibers. I will also discuss some applications: projectivity of proper coarse moduli spaces, characteristic zero implications and a special case of subadditivity of Kodaira dimension in the above mentioned moduli setting. (Received August 21, 2012)