

## Title: Chiral Algebras from Three Dimensions

Abstract: 25 years ago Nakajima found an intriguing connection between what we now call Vafa-Witten partition functions of certain 4-manifolds and characters of affine Kac-Moody algebras. Nowadays, these algebras can be understood as chiral algebras of 2d (0,2) theories  $T[M4]$ , a perspective that allows to predict various properties of  $VOA[M4]$  and, in some cases, construct such algebras by cutting and gluing. In this lecture, I will explain an equally intriguing observation for 3-manifolds that relates q-series invariants of 3-manifolds and characters of logarithmic VOAs. Physically, these q-series partition functions are defined (in 2013 work with A.Gadde and P.Putrov) as "elliptic genera for combined 3d-2d systems" also called half-indices.