Speaker:Marathe, KishoreTitle:Level in Chern-Simons TheoryAuthors:Marathe, Kishore B.Affiliations:CUNY, USA and MPI-MIS, Germany

Abstract: The Chern-Simons theory is parametrized by a real number k called the level of the theory. In many applications one is required to restrict the level to take integral values. Formulas involving level usually consider only the positive integral values. We discuss the significance of level in different applications of the Chern-Simons theory and extend the formulas with positive integral values of k to negative integral values of k. The shift in k by the dual Coxeter number of the gauge group must also be taken into account for negative k. In Witten's derivation of the skein relations for the family of two variable Jones polynomials by using topological quantum field theory, the negative values of the level k (suitably shifted by the dual Coxeter number of SU(n)) give the missing half of this family which contains the skein relation characterizing the original single variable Jones polynomials.