1154-55-1272   **Ningchuan Zhang*** (`nzhang28@illinois.edu`). *Analogs of Dirichlet L-functions in $K(1)$-local homotopy theory.*

The relation between Eisenstein series and the J-homomorphism is an important topic in $K(1)$-local homotopy theory. Both sides are related to the special values of the Riemann ζ-function. This relation is most clearly understood in the context of elliptic cohomology and topological modular forms.

Number theorists have studied the twistings of the Riemann ζ-functions and Eisenstein series by Dirichlet characters. In this talk, we investigate the analogs of Dirichlet character twistings in homotopy theory. We will introduce the Dirichlet twists of the J-spectrum. The homotopy groups of these Dirichlet J-spectra are related to the special values of the Dirichlet L-functions, and thus to congruences of the twisted Eisenstein series. We will explain the connection between Dirichlet J-spectra and the twisted Eisenstein series by generalizing Katz's algebro-geometric explanation of congruences of the normalized Eisenstein series. (Received September 14, 2019)