

Online Number Theory Seminar

27 October 2023. – 17:00-17:50

Tung T. Nguyen : On the arithmetic of Fekete polynomials of principal Dirichlet characters

Fekete polynomials have a rich history in mathematics. They first appeared in the work of Michael Fekete in his investigation of Siegel zeros of Dirichlet L-functions. In a previous study, we explored the arithmetic of generalized Fekete polynomials associated with primitive quadratic Dirichlet characters. We found that these polynomials possess a variety of interesting and important arithmetic and Galois-theoretic properties.

In this talk, we will introduce a different incarnation of Fekete polynomials, namely those associated with principal Dirichlet characters. Through numerical experiments, we examine their cyclotomic and non-cyclotomic factors and identify some of their roots in the unit circle. We also investigate their modular properties and special values. Last but not least, based on both theoretical and numerical data, we propose a precise question on the structure of the Galois group of these Fekete polynomials. This is based on joint work with Shiva Chidambaram, Jan Minac, and Nguyen Duy Tan.