Exceptional zeros of twisted triple product $p$-adic $L$-functions

Abstract:

$p$-adic $L$-functions involve modified $p$-factors which measure the discrepancy between the $p$-adic and complex $L$-values in the interpolation formula. It is a puzzling fact that this factor can vanish at the central point. Then the $p$-adic $L$-function trivially vanish at the point, and such a zero is called an exceptional zero. The $p$-adic $L$-function of an elliptic curve has an exceptional zero if and only if it has split multiplicative reduction at $p$, and the precise relation between derivative of the $p$-adic $L$-function and the algebraic part of the complex $L$-value was conjectured by Mazur-Tate-Teitelbaum and proved by Greenberg-Stevens. There have been many attempts to extend this result of Greenberg-Stevens to more general automorphic forms. In this talk I will consider the exceptional zeros of the cyclotomic twisted triple product $p$-adic $L$-function associated to elliptic curves over rationals and a real quadratic field, and prove an identity between derivatives of the $p$-adic $L$-function and complex $L$-values. I will also consider exceptional zeros of a certain $p$-adic $L$-function of degree 6 associated with two rational elliptic curves. This is a joint work with Ming-Lun Hsieh.