Algorithms for local $p$-adic heights at $p$

Steffen Müller  
(University of Groningen)

Monday, May 1 at 4:00 pm  
665 Commonwealth Avenue, CDS 365  
Tea and cookies at 3:30

Abstract: Various applications, such as the quadratic Chabauty method and the numerical verification of $p$-adic versions of the conjecture of Birch and Swinnerton-Dyer, require algorithms for $p$-adic heights on the Jacobian of a curve over $\mathbb{Q}$. In analogy with the Arakelov-theoretic decomposition of the Néron-Tate height due to Faltings and Hriljac, one can decompose these heights into a sum of local pairings between divisors on the curve. In practice, the component at $p$ is usually the most difficult one. For odd degree hyperelliptic curves with good ordinary reduction at $p$, it can be computed using an algorithm due to Besser and Balakrishnan. I will report on ongoing work on algorithms for local $p$-adic heights at $p$ in various other situations. This is joint work with Gajović, with Bianchi and Kaya, and with Kaya, Masdeu and van der Put.