

**Special Seminar: Xuan Duong, Macquarie University, on Friday, Sept. 26, 1:00-2:00 at ICERM**

**Title: Hardy spaces associated to the discrete Laplacians on graphs and boundedness of singular integrals**

Let  $\Gamma$  be a graph with a weight  $\sigma$ . Let  $d$  and  $\mu$  be the distance and the measure associated with  $\sigma$  such that  $(\Gamma, d, \mu)$  is a doubling space. Let  $p$  be the natural reversible Markov kernel associated with  $\sigma$  and  $\mu$  and  $P$  the associated operator defined by  $Pf(x) = \sum_y p(x, y)f(y)$ . Denote by  $L = I - P$  the discrete Laplacian on  $\Gamma$ .

In this talk we develop the theory of Hardy spaces associated to the discrete Laplacian  $H_L^p$  for  $0 < p \leq 1$ . We then obtain boundedness of certain singular integrals on  $\Gamma$  such as square functions, spectral multipliers and Riesz transforms on the Hardy spaces  $H_L^p$ . This is joint work with The Anh Bui.