1125-60-1510 **Michael Damron**, **Wai-Kit Lam*** (lamw@indiana.edu) and **Xuan Wang**. *Asymptotics for 2D critical first-passage percolation.*

We consider the first-passage percolation on $\mathbb{Z}^2$ with i.i.d. weights, whose distribution function satisfies $F(0) = p_c = 1/2$. Denote $T(0, \partial B(n))$ as the passage time from the origin to the boundary of the box $[-n, n]^2$. We characterize the limit behavior of $T(0, \partial B(n))$ by the conditions on the distribution function F. We also give exact conditions under which $T(0, \partial B(n))$ will have uniformly bounded mean or variance. These results answer several questions of Kesten and Zhang from the '90s. We also prove a CLT under a minimal moment assumption when both the mean and variance go to infinity as $n \to \infty$. The main tool involves a new relation between first-passage percolation and invasion percolation: up to a constant factor, the passage time in critical first-passage percolation has the same first-order behavior as the passage time of an optimal path constrained to lie in an embedded invasion cluster. This is joint work with Michael Damron and Xuan Wang. (Received September 17, 2016)