

# Connectivity of random geometric graphs

Amites Sarkar  
Department of Mathematical Sciences,  
University of Memphis

Let  $\mathcal{P}$  be a Poisson process of intensity one in the square  $S_n$  of area  $n$ . We join each point of  $\mathcal{P}$  to its  $k$  nearest neighbours, obtaining the random geometric graph  $G(S_n, k)$ . How large should  $k$  be to make  $G(S_n, k)$  connected? I'll discuss upper and lower bounds for this problem. Specifically, let  $p(n, k)$  be the probability that  $G(S_n, k)$  is connected. I'll show that for  $k < 0.3 \log n$ ,  $p(n, k) \rightarrow 0$  as  $n \rightarrow \infty$ , and sketch a proof that if  $k > 0.52 \log n$ ,  $p(n, k) \rightarrow 1$  as  $n \rightarrow \infty$ .

This is a joint work with Paul Balister, Béla Bollobás and Mark Walters.