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**Xiaolong Han\*** ([xiaolong.han@anu.edu.au](mailto:xiaolong.han@anu.edu.au)), Department of Mathematics, Australian National University, Canberra, ACT 0200, Australia. *Spherical harmonics with maximal norm growth.*

Sogge's  $L_p$  estimates bound the  $L_p$  norms of normalized eigenfunctions on smooth and compact manifolds. They are also sharp on the sphere, with maximizers as Gaussian beams for small  $p$  and zonal harmonics for large  $p$ . In this talk, we investigate the density of these maximizers in the orthonormal eigenfunction basis, and construct a positive density subsequence of orthonormal spherical harmonics which achieves the maximal  $L_p$  norm growth for all small  $p$ . This gives an example of a Riemannian surface supporting such subsequence of eigenfunctions. Furthermore, we provide an explicit lower bound on the density in this example. (Received July 16, 2014)