Loop Statistics in $SU(2)_k$ **String-Net Models** S.L. SONDHI, VEDIKA KHEMANI, Princeton University, RAHUL ROY, University of California at Los Angeles — Topologically ordered quantum phases are often realized as condensates of highly-fluctuating, extended "string-net" degrees of freedom. We posit that the non-local quantum order in these phases manifests itself in universal, geometric properties of the underlying string-nets. In this work, we consider a mapping from the $SU(2)_k$ string-net models to generalized loop models and compute statistical properties of the resulting loops. In an appropriate classical limit, we find that the loop length distribution shows critical scaling with exponents that are independent of k. We also report loop-length scaling for the quantum $SU(2)_2$ and $SU(2)_3$ models.

S. L. Sondhi
Princeton University