

Tuesday, October 6th @ 2pm

Schwinger Lounge

Hosted by Prof. Thomas Dumitrescu

“Monopoles, duality, and large charge in Chern-Simons QED₃”

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Abstract: Monopole operators are local operators in 3d Abelian gauge theories with N flavors of scalars or fermions, and Chern-Simons level k . We compute the scaling dimension of these monopoles in a large N, k and fixed k/N expansion for both fermions and scalars to subleading order. We use these results to check various dualities for one or two flavors, and find that the large N expansion is surprisingly accurate even for $N=1, 2$. We also find evidence for the conjectured $SU(2)$ symmetry enhancement in the $k=-3/2$ and $N=1$ fermionic theory (and its $k=2$, $N=1$ scalar dual). Lastly, we use our result to compute the universal term in the large charge effective field theory of these theories, and find that the fermionic case is consistent with a superfluid description, while the scalar case resembles a free fermion.