Irreducible representations of link groups in SU(2)

Abstract:
Suppose $L$ is a link in $S^3$, we show that $\pi_1(S^3 - L)$ admits an irreducible meridian-traceless representation in $SU(2)$ if and only if $L$ is not the unknot, the Hopf link, or a connected sum of Hopf links. As a corollary, $\pi_1(S^3 - L)$ admits a (not necessarily meridian-traceless) irreducible representation in $SU(2)$ if and only if $L$ is neither the unknot nor the Hopf link. This result generalizes a theorem of Kronheimer and Mrowka to the case of links. The proof is based on singular instanton Floer theory and an observation about finite simple graphs.

This is joint work with Yi Xie.

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