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Supersymmetric Gauge Theories with Confining Phases

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Confinement is one of the unresolved problems in modern physics. rgies. The analysis of confinement requires non-perturbative approaches due to asymptotic freedom. Supersymmetric gauge theories provide a powerful framework in which such non-perturbative analyses can be carried out. They are more tractable than their non-supersymmetric counterparts.In particular, the holomorphy of the superpotential enables various exact calculations, including non-perturbative effects. Motivated by the goal of deepening our understanding of the confinement mechanism, we classify supersymmetric gauge theories that possess confining phases in the strict sense. Then, we identify condensation of some operators in each case, which must be related to confinement. If possible, we also discuss the consequences of supersymmetry breaking in these theories.

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