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## Recent progress in understanding deconfinement and chiral symmetry breaking transitions

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While the crucial role of gauge topology was recognized from 1970's, confinement was associated with monopoles and chiral symmetry breaking with instantons. Recognizing presence of non-zero holonomy, van Baal and others discovered splitting of the instantons into their constituents —the instanton-dyons. Several groups now work out properties of their ensembles, which generate both the deconfinement and chiral phase transitions in QCD-like theories. Introducing variable phases for quark periodicity conditions —known as flavor holonomies —one can switch fermion coupling to different dyons, and thus dramatically change both the order and temperature of both transitions. First lattice studies of modified —so called  $Z_N$ -symmetric QCD —have also found these effects.

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