Applications of Floer homology to clasp number vs genus.

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A basic question in four dimensional topology is determining the smooth four-ball genus of a knot in the the three sphere. A closely related question is determining the minimal number of double points of a disk smoothly immersed bounding the knot. We'll survey recent advances on this problem using tools coming from gauge theory and related invariant. This circle of ideas is related to interesting questions in algebraic geometry.