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Daniel A Ramras* (dan.ramras@vanderbilt.edu), Department of Mathematics, 1326 Stevenson Center, Vanderbilt University, Nashville, TN 37203. *Deformation K-theory and moduli spaces of flat connections.*

Recent work of Tyler Lawson provides a homotopy theoretical method for analyzing the moduli space $\text{Hom}(G, \text{U}(n))/\text{U}(n)$ of unitary representations of a discrete group G , after stabilizing with respect to the rank n . When G is the fundamental group of a compact manifold M , this space may also be viewed as the moduli space of flat connections over M . In this talk, I'll explain Lawson's results, which involve the Bott map in deformation K-theory. I'll then explain how Lawson's work, when combined with Yang-Mills theory, can be used to determine the homotopy type of this stable moduli space in the case where G is the fundamental group of a (possibly non-orientable) surface. Results and conjectures for other groups (e.g. torsion-free crystallographic groups) will also be discussed. (Received July 08, 2008)