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**Daniel A. Ramras\*** ([dan.ramras@vanderbilt.edu](mailto:dan.ramras@vanderbilt.edu)), Department of Mathematics, 1326 Stevenson Center, Vanderbilt University, Nashville, TN 37240. *Deformation K-theory and moduli spaces of representations.*

Recent work of Tyler Lawson has provided a homotopy theoretical method for analyzing the moduli space  $\text{Hom}(G, \text{U}(n))/\text{U}(n)$  of unitary representations of an infinite discrete group  $G$ , after stabilizing with respect to the rank  $n$ . In this talk, I'll 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. This moduli space can also be viewed as the moduli space of flat connections, forming the link with Yang-Mills theory. Results and conjectures for other groups will also be discussed. (Received August 17, 2008)