THE ASYMPTOTIC GEOMETRY OF THE MODULI SPACE OF HIGGS BUNDLES OVER A RIEMANN SURFACE

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Abstract

In this talk, I aim to give an overview of some known results and several open questions concerning geometric and topological properties of the moduli space $\mathcal{M}_{k,d}$ of stable Higgs bundles (of rank k and degree d) on a compact Riemannian surface Σ. I shall in particular discuss the construction of $\mathcal{M}_{k,d}$ as the space of gauge equivalence classes of solutions of the PDE

$$\begin{cases} 0 = & \bar{\partial}_A \Phi \\ 0 = & F_A + t^2[\Phi \wedge \Phi^*] \end{cases}$$

for some parameter $t > 0$. Here A denotes a unitary connection and Φ a Higgs field on Σ. Some new analytical results concerning the degeneration behaviour of $\mathcal{M}_{2,d}$ in the limit $t \to \infty$ will be presented.
(Joint work with Rafe Mazzeo, Hartmut Weiß and Frederik Witt).

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