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Connected components of character varieties and Higgs bundles

Given a compact Riemann surface X and a real reductive Lie group G , let $R_G = \text{Hom}^{\text{red}}(\pi_1 X, G)/G$ be the space of reductive representations of $\pi_1 X$ in G , the so-called G -character variety of X . This is a space with a very rich topological structure, reflecting the topology of both X and G . We shall introduce G -Higgs bundles over X and explain how to use them for studying the simplest topological invariant of R_G , namely its connected components. The general intrinsic approach for G complex will be mentioned and also some examples such as $G = Sp(2p, 2q)$ will be considered.

Based on joint work with Oscar García-Prada (ICMAT).

