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Representation varieties of non-orientable surface groups

Let G be a Lie group, Σ be a compact two manifold. When Σ is orientable, the representation variety

$$\mathcal{M}(\Sigma, G) = \text{Hom}(\pi_1(\Sigma), G)/G$$

has many interesting properties and has been the subject of intense investigation for several decades. In recent years, the case of nonorientable Σ has also attracted some attention. This talk will survey our current understanding of the topology of $\mathcal{M}(\Sigma, G)$ when Σ is nonorientable.