Nonabelian Hodge Spaces and Nonlinear Representation Theory

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The theory of connections on curves and Hitchin systems is something like a “global theory of Lie groups,” where one works over a Riemann surface rather than just at a point. We’ll describe how one can take this analogy a few steps further by attempting to make precise the class of rich geometric objects that appear in this story (including the non-compact case), and discuss their classification, outlining a theory of “Dynkin diagrams” as a step towards classifying some examples of such objects. The first large class of isomorphisms between such integrable systems was found by Adams–Harnad–Hurtubise.

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