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Diagrams, fission spaces and global Lie theory

I'll recall how to construct algebraic Poisson varieties (twisted wild character varieties) by gluing pieces of surface with wild boundary conditions (extending the q -Hamiltonian framework), and then move on to discuss the link to quiver varieties and how this may be generalised, leading to a theory of "diagrams" for the wild character varieties (i.e. the wild nonabelian Hodge moduli spaces in their Betti algebraic structure). The most recent development involves understanding the diagrams in the twisted case, that generalise the usual quivers. In particular we finally understand the appearance of "affine B_2 " on Okamoto's 1992 list of Weyl groups of the Painlevé equations. Much of this is motivated by quite straightforward questions about classifying rational Lax representations of finite dimensional integrable systems.

Some references:

--The first examples of fission spaces were really in Birkhoff's 1913 paper; they were shown to be q -Hamiltonian in arXiv:math/0203161, but they weren't given this name until Ann. Inst. Fourier 59, 7 (2009), and the story was then extended to the general case in arXiv:1111.6228, arXiv:1512.08091 (joint with Yamakawa)

--The theory of diagrams is in arXiv:1907.11149 (with Yamakawa), and has been extended by Doucot arXiv:2107.02516."