Title: **The geometric structure that describes monopole dynamics**

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Abstract:

For a particle in the magnetic field of a cloud of monopoles, the naturally associated 2-form on phase space is not closed, and so the corresponding bracket operation on functions does not satisfy the Jacobi identity. Thus, it is not a Poisson bracket; however, it is twisted Poisson in the sense that the Jacobiator comes from a closed 3-form. The space $\mathcal{D}$ of densities on phase space is the state space of a plasma. The twisted Poisson bracket on phase-space functions gives rise to a bracket on functions on $\mathcal{D}$. In the absence of monopoles, this is again a Poisson bracket. It has been shown by Heninger and Morrison that this bracket is not Poisson when monopoles are present. In this note, we give an example where it is not even twisted Poisson. Therefore, in general, we can claim that such twisted Poisson structure does not exist, but: are there specific configurations of clouds of monopoles that we can actually endow with such structure? I will disclose this secret in this seminar!.