"Integrable and superintegrable systems on moduli spaces of flat connections."

Let G be a simple Lie group. For a compact topological surface the moduli space of G-flat connections has a natural symplectic structure when the surface is closed and a Poisson structure when the surface has boundary (Atyiah and Bott). Symplectic leaves of this Poisson variety are parametrized by conjugacy classes of monodromies along connected components of the boundary. The goal of these lectures is to explain that central functions on holonomies along any simple collection of curves on a surface define a superintegrable system and to describe these systems in some special cases. We will also see that these systems are natural generalizations of spin Calogero-Moser systems.

The lectures will start with the definition and properties of superintegrable systems. Then the spin Calogero-Moser systems will be introduced and their superintegrability will be proven.
After this superintegrable systems corresponding to simple curves on a surface will be introduced and the connection to Calogero-Moser type systems will be explained.

The lectures are based on joint work with S. Artamonov and J. Stokman.