Poisson geometry and methods of quantization (Geometry Elective 2 - NMAG497)
Master course at Faculty of Mathematics and Physics

<u>Start:</u> Wednesday, February 18, 2026, 10:40–12:10

<u>Room:</u> K358MUUK, Areál Karlín, Sokolovská 83, 18600 Praha 8

<u>Exam:</u> Seminar at the end of the semester

<u>Description:</u>

This course revolves around Poisson manifolds, which are smooth manifolds endowed with a Poisson bivector. If the latter is nondegenerate, we obtain a symplectic manifold. Such additional structure allows us to consider Poisson cohomology, Hamiltonian and Poisson vector fields. From a physical point of view, symplectic manifolds admit an interpretation in the context of Hamiltonian mechanics. We describe a phase space reduction à la Marsden-Weinstein and discuss a Lie algebroid interpretation of Poisson manifolds. In the second half of the course, we study the deformation quantization of symplectic manifolds. The goal is to give a full proof of the celebrated Fedosov construction of star products.

$$\{f, g\} = \omega(X_f, X_g) \qquad , \qquad [X_f, X_g] = -X_{\{f,g\}}$$

$$f \star g = fg + \frac{i\hbar}{2}\{f, g\} + \dots$$

Online participation is possible! <u>Contact:</u> thomas.weber@matfyz.cuni.cz

Thomas Weber