Functional Analytical Methods in Classical Physics II

Lecture by Dr. Holger Stephan (WIAS) at Humboldt-Universität zu Berlin

Description of the lecture:

The lecture is intended for mathematicians who are interested in the mathematical methods used in classical physics. Physics serves here, primarily, as a source of ideas. The lecture is not to understand as "physics for mathematicians" but rather as "physically relevant mathematics for mathematicians".
From the point of view of mathematics, we develop the basics for an understanding of the deterministic classical physics. These are mainly convex analysis and variational problems.
From the point of view of physics, we discuss the most important equivalent concepts of analytical mechanics. These are

- Lagrangian mechanics (duality of freedom and constraint)
- Hamiltonian mechanics (duality of extensive and intense quantities)
- Hamilton-Jacobi formalism (duality of wave and particle).

The lecture is a continuation of the last semester lecture with the same name. For understanding of this lecture, the knowledge of that lecture is useful, but not necessary.