

HOLOMORPHIC SYMPLECTIC MANIFOLDS AND COMPLETELY INTEGRABLE SYSTEMS

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Irreducible holomorphic symplectic manifolds are one of the building blocks of compact Kähler manifolds with trivial first Chern class. They made their first appearance in algebraic geometry in the 80's [1, 3], thanks to results in differential geometry, and since then have attracted significant attention. Their rich geometry has ties to other areas of mathematics, such as representation theory and mathematical physics.

Some irreducible holomorphic symplectic manifolds have a structure of completely integrable system which, in this context, means that they admit a fibration whose general fiber is a complex torus which is Lagrangian [2]. These fibrations are called Lagrangian and it turns out they are extremely useful for constructing and studying examples of irreducible holomorphic symplectic manifolds. In this talk I will give an introduction to irreducible holomorphic symplectic manifolds, with a focus on Lagrangian fibrations.

REFERENCES

- [1] A. Beauville. Variétés Kähleriennes dont la première classe de Chern est nulle. *J. Diff. Geom.*, 18:755–782, 1983.
- [2] A. Beauville. Systèmes hamiltoniens complètement intégrables associés aux surface K3. *Symp. Math.*, 32 pp 25031, 1991.
- [3] S. Mukai. Symplectic structure of the moduli space of sheaves on an abelian or K3 surface. *Invent. Math.*, 77(1):101–116, 1984.