Course: Introduction to Complex Geometry

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Abstract:

The aim of these lectures is to introduce classical objects and tools of Complex Geometry. We will cover the following topics:

- Review basic notions of several complex variables;
- Notion of almost complex and complex structures, complex manifolds, smooth and holomorphic complex vector bundles, Hermitian metrics on complex vector bundles;
- Basics of Harmonic forms and cohomology;
- Holomorphic structures on line bundles, connection, curvature and Chern classes.

Prerequisites: differential geometry, complex analysis of one variable.

References:

D. Huybrechts, *Complex geometry*, Universitext, Springer, 2005.

J.-P. Demailly, *Complex Analytic and Differential Geometry*, available online: https://www-fourier.ujf-grenoble.fr/ demailly/manuscripts/agbook.pdf

P. Griffiths, J. Harris, *Principles of Algebraic Geometry*, Wiley Classics Library, 1994.

C. Voisin, *Hodge Theory and Complex Algebraic Geometry I*, Cambridge University Press, 2010.