

COMPLEX MANIFOLDS AND HOLOMORPHIC FOLIATIONS

S. IVASHKOVICH, UNIVERSITY OF LILLE-1

ABSTRACT. We shall give four 1h lectures about holomorphic foliations (mostly) on compact complex surfaces.

sect.FOL

1. HOLOMORPHIC FOLIATION BY CURVES ON COMPLEX MANIFOLDS.

Differential equations and holomorphic foliations: definitions and examples. Poincaré domains. Vanishing cycles and simultaneous uniformization. Generalized Hartogs figures. Pluriclosed taming forms and reparameterizations.

sect.EXAMP

2. CLASSIFICATION OF SURFACES WITH FOLIATED SHELLS.

Global spherical shells and foliated shells. Examples: Hopf surfaces and Kato surfaces. Classification. Minimal leaves. Problem of existence of exceptional minimals and Levi flat hypersurfaces. Examples of Levi flat hypersurfaces.

sect.NEF

3. NEF MODELS OF HOLOMORPHIC FOLIATIONS ON COMPACT SURFACES.

Rational surfaces and fibrations. Riccati foliations. Minimal models of compact complex surfaces and holomorphic foliations. Canonical bundle of a holomorphic foliation and nef models. Reduction to a nef model, examples. Poincaré metric along the leaves.

sect.CONTR

4. LIMITING BEHAVIOR OF LEAVES WITH ATTRACTING HOLONOMY.

Existence of leaves with attracting holonomy. The structure of the holonomy group. Holomorphic representation of the holonomy group. Imbedding of Poincaré domains in \mathbb{C}^2 . Limiting behavior of parabolic leaves. Examples in \mathbb{P}^2 and \mathbb{T}^2 .