



The Complex Analysis group from the University of Wuppertal organizes a mini-course on Foliations of 10 lectures of 90 minutes each, given by Prof. Ivashkovich (Lille) starting from Tuesday 10.02.2015.

## Holomorphic Foliations

(Prof. Sergey Ivashkovich, Université des Sciences et  
Technologies de Lille)

**Schedule:**  
(all times c.t.)

day	date	time	room
Tuesday	10.02.2015	14 – 16	G.15.25
Thursday	12.02.2015	14 – 16	G.15.25
Friday	13.02.2015	14 – 16	G.15.25
Tuesday	17.02.2015	16 – 18	G.15.25
Thursday	19.02.2015	14 – 16	G.15.25
Friday	20.02.2015	14 – 16	G.15.25
Monday	23.02.2015	14 – 16	G.15.25
Tuesday	24.02.2015	14 – 16	G.15.25
Thursday	26.02.2015	14 – 16	G.15.25
Friday	27.02.2015	14 – 16	G.15.25

**Abstract:** We shall give in our lectures an introduction to the theory of holomorphic foliations. Any preliminary knowledge of foliation theory is not required but some knowledge of complex analysis of several complex variables is assumed. The supposed length of the course is 10 lectures. The material will be organized in the following three chapters.

### 1. Foliations on Real Manifolds

1. Poincaré–Bendixson Theorem
2. Orientable direction fields
3. Real analytic foliations and Haefliger theorem
4. Vanishing cycles and foliated currents
5. Novikov’s theorem
6. Holonomy
7. Exceptional invariant sets and theorem of Sacksteder
8. Stability

## 2. Singular Holomorphic Foliations

1. Smooth and singular holomorphic foliations
2. Reduction of singularities
3. Baum–Bott index and formula
4. Non-existence of exceptional minimal sets in codimension one holomorphic foliations on  $\mathbb{P}^n$  for  $n \geq 3$
5. Relation to Levi flat hypersurfaces
6. Rational quasi-fibrations and nef models
7. Poincaré metric along leaves

## 3. Vanishing Cycles and Foliated Shells

1. Simultaneous uniformization and Poincaré domains
2. Vanishing ends and completed leaves
3. Extension of meromorphic mappings after a reparametrization and foliated shells
4. Imbedded cycles and shells
5. Examples
6. Rothstein convexity of Poincaré domains
7. Unified holomorphic representation of the fundamental group
8. Poincaré–Bendixson theory for parabolic foliations by curves