# Groupe de travail Théorie Ergodique et Systèmes Dynamiques, 2023-2024

## Menu

### Potential theory on $\mathbb{C}$

**Estimate:** 2 talks.
**Reference:** [9]
  Potential of a measure $\mu$ with compact support in $\mathbb{C}$:

$$p_\mu(z) := \int_{\mathbb{C}} \ln|z - w| \, \mathrm{d}\mu(w)$$

  Energy of such a measure $\mu$:

$$I(\mu) := \int_{\mathbb{C}} P_\mu(z) \, \mathrm{d}\mu(z)$$

  Equilibrium measure of a compact set $K$:

$$I(K) := \sup_{\substack{\mu \in \mathcal{P}(K) \\ \mathrm{Supp}(\mu) \subset K}} I(\mu)$$

  Then $I(K) = -\infty$ if and only if $K \subset \{u = -\infty\}$ for some subharmonic function $u$.

### Dynamics of $P : \mathbb{C} \to \mathbb{C}$

**Estimate:** 2 talks.
**References:** [1, 2, 9]
  Ergodic theory: entropy, equilibrium measures, etc.
  $K_p$, filled Julia sets and its properties: equilibrium measures, energy, etc.
  Existence and uniqueness of the measure of maximal entropy.
  Distribution on periodic points.

### Pluripotential theory and complex geometry

**Estimate:** 3 talks.
**References:** [4, 5, 7, 8]
  De Rham and Dolbeau cohomologies, $\partial\overline{\partial}$-lemma on $\mathbb{P}_1(\mathbb{C})$.
  Currents and cohomology of currents [5].
  Plurisubharmonic functions Monge-Ampère measures on $\Omega \subset \mathbb{C}^k$.
  Quasi-plurisubharmonic functions on $\mathbb{P}^k(\mathbb{C})$ [4, 7, 8].

# Dynamics of $f : \mathbb{P}^k(\mathbb{C}) \to \mathbb{P}^k(\mathbb{C})$

**Estimate: 2 talks.**
**References:** [3, 6]

  Green currents, Green measures.
  Equidistribution of periodic points and preimages.

# Repartition

| Talk number | Date | Subject | Speaker |
|:---:|:---|:---|:---|
| 1 | 04.12 | Potential theory on $\mathbb{C}$ | Thomas Gauthier |
| 2 | 18.12 | Potential theory on $\mathbb{C}$ | Mats Bylund |
| 3 | | Dynamics on $\mathbb{C}$ | Thomas Morand |
| 4 | | Dynamics on $\mathbb{C}$ | Thomas Morand ? |
| 5 | | Pluripotential theory | Thomas Gauthier |
| 6 | | Pluripotential theory | Damien Thomine |
| 7 | | Pluripotential theory | Yugang Zhang ? |
| 8 | | Dynamics on $\mathbb{P}^k(\mathbb{C})$ | Yugang Zhang ? |
| 9 | | Dynamics on $\mathbb{P}^k(\mathbb{C})$ | Yugang Zhang ? |

# References

[1]  H. Brolin, *Invariant sets under iteration of rational functions*, Arkiv för Matematik **6** (1965), pp. 103–144.

[2]  L. Carleson and T.W. Gamelin, *Complex dynamics*, Universitext: Tracts in Mathematics. Springer, 1993.

[3]  D. Cerveau, É. Ghys, N. Sibony and J.-C. Yoccoz, Notes written by M. Flexor, *Dynamique et géométrie complexes*, Sociétés Mathématique de France, Panoramas et Synthèses **8**. 1999.

[4]  O. Debarre, *Tores et variétés abéliennes complexes*, Sociétés Mathématique de France, Cours Spécialisés **6**. EDP Sciences, 2000.

[5]  J.-P. Demailly, *Complex analytic and differential geometry*, En ligne.

[6]  T.-C. Dinh and N. Sibony, *Dynamics in several complex variables: endomorphisms of projective spaces and polynomial-like mappings*, pp. 165–294 in *Holomorphic dynamical systems. Lectures given at the C.I.M.E. Summer School held in Cetraro, July 7–12, 2008*. Edited by Graziano Gentili, Jacques Guenot and Giorgio Patrizio. Lecture Notes in Mathematics, 1998. Springer-Verlag, Berlin; Fondazione C.I.M.E., Florence, 2010. pp.

[7]  P. Griffiths and J. Harris, *Principles of algebraic geometry*, John Wiley and Sons, 1978.

[8]  M. Klimek, *Potential theory in the complex plane*, London Mathematical Society Monographs, New Series **6**. Oxford Science Publications, 1992.

[9]  T. Ransford, *Potential theory in the complex plane*, London Mathematical Society, Student Texts, Book **28**. Cambridge Univeristy Press, 1995.