# 1day workshop on dynamical systems and complex geometry[1]

25 January, 2023, at Osaka Metropolitan University.

## Program

**9:30 - 10:00 Registration**

**10:00 - 11:00 Satoshi Ogawa (Osaka Metropolitan University)**
Linearization of transition functions along a certain class of Levi-flat hypersurfaces

**11:10 - 12:10 Takayuki Koike (Osaka Metropolitan University)**
On a neighborhood of the anti-canonical divisor of the blow-up of the projective plane at nine points

– **Lunch Time** –

**13:30 - 14:30 Yohsuke Matsuzawa (Osaka Metropolitan University)**
Arithmetic dynamics of cohomologically hyperbolic maps

**14:40 - 15:40 Yoshinori Hashimoto (Osaka Metropolitan University)**
Uniform Hörmander estimates for flat holomorphic line bundles

**16:00 - 17:00 Laurent Stolovitch (Université Côte d'Azur)**
On neighborhoods of embedded complex tori

**17:10 - 17:40 Jinichiro Tanaka (Osaka Metropolitan University)**
Toward a generalization of the Bochner-Martinelli kernel to complex abelian Lie groups

[1]This conference is supported by JSPS Grant-in-Aid for Early-Career Scientists 20K14313, and partly by Osaka Central Advanced Mathematical Institute (MEXT Joint Usage/Research Center on Mathematics and Theoretical Physics).

# Abstracts

**Satoshi Ogawa (Osaka Metropolitan University)**
Linearization of transition functions along a certain class of Levi-flat hypersurfaces

We pose a normal form of transition functions along some Levi-flat hypersurfaces obtained by suspension. By focusing on methods in circle dynamics and linearization theorems, we give a sufficient condition to obtain a normal form as a geometrical analogue of Arnol'd's linearization theorem.

**Takayuki Koike (Osaka Metropolitan University)**
On a neighborhood of the anti-canonical divisor of the blow-up of the projective plane at nine points

We investigate the complex analytic structure of a neighborhood of the anti-canonical divisor of a rational surface obtained by blowing up the projective plane at nine points. We also explain some complex dynamical techniques concerning on the linearization of neighborhoods of nodal curves, and smooth elliptic curves whose normal bundles are neither torsion nor Diophantine.

**Yohsuke Matsuzawa (Osaka Metropolitan University)**
Arithmetic dynamics of cohomologically hyperbolic maps

A rational self-map on a projective variety is called cohomologically hyperbolic if there is p such that the p-th dynamical degree is strictly larger than others. I will introduce several results on some conjectures for such maps, including existence of Zariski dense orbits. This talk will be based on a joint work with Long Wang.

**Yoshinori Hashimoto (Osaka Metropolitan University)**
Uniform Hörmander estimates for flat holomorphic line bundles

We prove Hörmander-type $L^2$-estimates for the dbar-operators that apply uniformly to all nontrivial flat holomorphic line bundles over a compact Kähler manifold. This can be regarded as an $L^2$-version of Ueda's lemma for Čech coboundaries, which has important applications in complex dynamical systems. A key ingredient in the proof is the observation that flat line bundles are topologically trivial and can be identified with the trivial bundle with the "perturbed" dbar operator which we define in terms of the Picard variety. This is a joint work with Takayuki Koike.

**Laurent Stolovitch (Université Côte d'Azur)**
On neighborhoods of embedded complex tori

The goal of the work incollaboration with X. Gong (Madison) is to show that an $n$-dimensional complex torus embedded in a complex manifold of dimensional $n+d$, with a split tangent bundle, has a neighborhood biholomorphic to a neighborhood of the zero section in its normal bundle, provided the latter has (locally constant) Hermitian transition functions and satisfies a *non-resonant Diophantine* condition.

**Jinichiro Tanaka (Osaka Metropolitan University)**
T. B. A.