

スーパーグローバルコース 数学特別講義6



Prof. Jongil Park

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締切日: 2月7日(水)

京都大学スーパーグローバル大学創生支
援事業 スーパーグローバルコース数学系

ユニット <https://ktgu.math.kyoto-u.ac.jp>



Date&Time : 9 Feb 2024 10:00 ~ 11:00

14 Feb 2024 16:45 ~ 17:45 (談話会共催)

Venue:(February 9) To be announced to participants only

(February 14) 110 Faculty of Science Bldg.#3,Kyoto University

February 9, 2024 ※2/9 分のタイトルとアブストラクトを変更しました。

Title: A study on 4-manifolds with Eulercharacteristic 3

Abstract:

The geography problem on 4-manifolds with Euler characteris-
tic 3 has long been studied in algebraic geometry and topology, but
it is still mysterious so that there are many unsolved problems left.
In this talk, we introduce some open problems in this field which
might be solved and might not be solved in near future. In particu-
lar, we'd like to review the following two topics and to report some
recent progress.

1. Smooth/symplectic fake projective planes and the existence
of exotic smooth structures on $CP^2, S^2 \times S^2$ and $CP^2 \# \bar{\mathbb{C}P}^2$.
2. Existence problem of minimal Lefschetz fibrations over T^2 with 3
singular fibers.
3. (Algebraic) Montgomery-Yang problem.

February 14, 2024 (当日参加可)

Title: Why is a rational blowdown surgery interesting in 4-
manifolds?

Abstract:

A rational blowdown surgery initially introduced by R. Fintushel and
R. Stern and later generalized by J. Park is one of the simple but
powerful techniques in study of 4-manifolds topology. Note that a
rational blowdown surgery replaces a certain linear chain of
embedded 2-spheres by a rational homology 4-ball. In particu-
lar, a rational homology ball is a key ingredient in the con-
struction of exotic smooth, symplectic 4-manifolds with small Eu-
ler characteristic and complex surfaces of general type with $pg = 0$.

It also plays an important role in Q-Gorenstein smoothings and
symplectic fillings of the link of normal surface singularities.

In this talk, I review what we have obtained in study of 4-manifolds
using a rational blowdown surgery in various levels. And then, I'd like
to discuss some open problems in related topics.