Titles and Abstracts for
Lefschetz Pencils and Low dimensional Topology

May 31 (Fri.)

13:40 - 14:40 Makoto enokizono (Tokyo University of Science)
Title : *On local signatures for holomorphic fibrations*
Abstract : The signature of a compact complex surface is sometimes localized on degenerate fiberes if it admits a certain holomorphic fibration on a Riemann surface, e.g., hyperelliptic fibrations, non-hyperelliptic fibrations of genus 3 and so on. In this talk, we introduce a local signature for plane curve fibrations (and other fibrations with some condition if time permits) from the algebraic point of view. On the other hand, Y. Kuno defined a local signature for (not necessarily holomorphic) plane curve fibrations from topological point of view. I explain these two local signatures are coincide. On the other hand, local signatures are not unique in general. We construct an infinite family of local signatures for "very general" holomorphic fibrations by using the theory of moduli spaces of Riemann surfaces.

15:00 - 16:00 R. Inanc Baykur (University of Massachusetts)
Title : *Symplectic 4-manifolds and Lefschetz pencils*
Abstract : We will explain how positive factorizations of mapping classes of surfaces correspond to symplectic 4-manifolds and important surfaces in them, via Lefschetz pencils and their multisections. This introductory lecture will be geared towards graduate students.

June 1 (Sat.)

9:40 - 10:40 Motoo Tange (University of Tsukuba)
Title : *Handle decompositions for slice disks and moves*
Abstract : Every slice disk in B^4 can be described by a handle diagram of B^4 and an embedded ribbon disk in the diagram. If the diagram is trivialized into canceling pairs by handle slides without 3-handles, the slice disk is isotopic to a ribbon disk. In this talk, considering moves (slides, isotopies, and cut-and-deletes) for such handle diagrams, we investigate how the diagrams can be simplified into a standard form.

11:00 - 12:00 Naoyuki Monden (Okayama University)
Title : *A strategy to reduce the number of Johnson's generators*
Abstract : Let $\mathcal{T}_g$ be the Torelli group of a closed surface Σ_g, which is the kernel of the action of the mapping class group of Σ_g on $\mathrm{H}_1(\Sigma_g;\mathbb{Z})$. In 1983, Johnson proved that $\mathcal{T}_g$ is finitely generated for $g \geq 3$. Johnson's generating set for $\mathcal{T}_g$ contains $9 \cdot 2^{2g-3} - 4g^2 + 2g - 6$ elements. In this talk, we would like to present a strategy to reduce the number of Johnson's generators.

13:40 - 14:40 Takahiro Oba (Kyoto University, RIMS)
Title : *Lefschetz-Bott fibrations on line bundles over symplectic manifolds (1)*
Abstract : In this talk I will give an overview of some aspects of Lefschetz-Bott fibrations and show that some complex line bundles over symplectic manifolds admit Lefschetz-Bott fibrations. I will also explain a relation between Lefschetz-Bott fibrations and strong symplectic fillings of contact manifolds.

15:00 - 16:00 R. Inanc Baykur (University of Massachusetts)
Title : *Exotic 4-manifolds via positive factorizations*
Abstract : We will discuss several new ideas and techniques for producing positive Dehn twist factorizations of surface mapping classes, which yield novel constructions of various interesting four-manifolds, such as symplectic Calabi-Yau surfaces and exotic rational surfaces, via Lefschetz pencils.

16:20 - 17:20 Osamu Saeki (Kyushu University)
Title : *Unlinking singular loci from regular fibers and its application to submersions*
Abstract : Given a link L in a closed oriented 3-manifold, we determine those links in its complement which can be realized as the singular point set of a generic smooth map of the 3-manifold into the plane having the link L as a regular fiber. Then, we study the case where the singular point set and regular fibers do not link each other. As an application, we give new techniques for constructing submersions of open 3-manifolds into the plane having a given link as a regular fiber.

17:40 - 18:10 Hiroto Masuda (Keio University)
Title : *Infinite nonabelian corks*
Abstract : A G-cork (resp. a weakly equivariant G-cork) is the pair (C, G) of a compact contractible 4-manifold C and a subgroup G of the diffeomorphism group (resp. the mapping class group) of ∂C such that any nontrivial element of G does not extend over C. In spite of active studies about corks, an example of G-corks or weakly equivariant G-corks for infinite nonabelian group G had not been found, as Tange noted in his paper. In this talk, we will see constructions of G-corks (resp. weakly equivariant G-corks) for any extension G of $\mathbb{Z}^m$ by a finite subgroup of $\mathrm{SO}(4)$ (resp. by a finite solvable group).

June 2 (Sun.)

9:40 - 10:40 Takahiro Oba (Kyoto University, RIMS)
Title : *Lefschetz-Bott fibrations on line bundles over symplectic manifolds (2)*
Abstract : Please see the abstract for the first talk.

11:00 - 12:00 Kouichi Yasui (Osaka University)
Title : *Minimal genus functions and smooth structures of 4-manifolds*
Abstract : The minimal genus function of a 4-manifold is a map that sends a second homology class to the minimal genus of surfaces representing the class. We discuss applications of the functions to smooth structures, such as exotic Stein 4-manifolds (arXiv:1102.3049, arXiv:1406.0050), 3-manifolds bounding exotic 4-manifolds (arXiv:1111.0620), and geometrically simply connected 4-manifolds (arXiv:1807.11453).