

IMU Meeting-Section on Geometry and Analysis  
Organizer: Ilya Gekhtman  
July 6, 2021

2:00 – 2:40pm Federico Salmoiraghi (Technion)

Title: Surgery on Anosov flows and bi-contact structures

Abstract: The use of surgery has profoundly enhanced our understanding of hyperbolic dynamics in dimension three. In this talk we describe a Dehn type surgery along a Legendrian-transverse knot in a bi-contact structure. We show that, when the bi-contact structure defines an Anosov flow, there is a strong connection between the Anosovity of the new flow and contact geometry. In contrast to the existing Dehn type surgeries on contact Anosov flows, for a vast class of knots our procedure does not require any restriction on the slope of the twist to generate new contact Anosov flows. We finally show that there are connections between our construction and the ones defined by Handel-Thurston, Fried-Goodman and Foulon-Hasselblatt.

2:50 – 3:30pm Anton Hase (Ben Gurion University)

Title: Integrability of quaternion-Kähler symmetric spaces".

Abstract: It is a famous result of Harish-Chandra that every non-compact Hermitian symmetric space can be realized as a bounded domain in a complex vector spaces. If we replace the complex numbers by the division algebra of quaternions in the definition of Hermitian symmetric spaces, we obtain the class of quaternion-Kähler symmetric spaces. While these spaces emerge in an analogous way, we show that there is no quaternionic analogue of Harish-Chandra's embedding theorem: A quaternion-Kähler symmetric space is integrable if and only if it is a quaternionic vector space, quaternionic hyperbolic space or quaternionic projective space. In the talk I will explain some of the background and some of the tools used in the proof.

4:00 – 4:40pm Arielle Leitner (Weizmann)

Title: An Advertisement for Coarse Groups and Coarse Geometry

Abstract: Coarse structures are used to study the large scale geometry of a space. For example, although the integers and the real line are different topologically, they look the same from "far away", in the sense that any geometric configuration in the real line can be approximated by one in the integers, up to some uniformly bounded error. A coarse group is a group object in the category of coarse spaces, for example, this means the group operation is only "coarsely associative," etc. In joint work with Federico Vigolo we study coarse groups. This talk will be an advertisement for our work, as we walk through examples that illustrate some of our main results, and connections to other subjects.

4:50 – 5:30pm Carlos De la Cruz (Weizmann)

Title: Stability in bounded cohomology and the Stiefel complex

Abstract: We say that an infinite sequence of groups and inclusions  $G_1 \hookrightarrow G_2 \hookrightarrow G_3 \hookrightarrow \dots$  is cohomologically stable if for every degree, there exists a term in the sequence after which all inclusions induce isomorphisms in cohomology. In the realm of bounded cohomology (in the sense of Gromov and Burger-Monod), where computations are scarce, stability turns out to be a useful tool. In this talk, I will explain how the problem of determining the bounded cohomology of a classical simple Lie group relates to the "bounded-cohomological stability" of the corresponding classical family, and then

present a stability result for such families of groups. An essential ingredient in its proof is the so-called Stiefel complex of a classical group, an object of both combinatorial and measure-theoretic flavor.