PROGRAM OF THE "PROSPECTOS EN TOPOLOGÍA" SEMINAR, SEMESTER 2022-1.

NOÉ BÁRCENAS AND MANUEL SEDANO

The "Prospectos en Topología" seminar during the 2022-1 term will consist of the following topics:

(i) Coarse Geometry and infinite genus surfaces.
- August 16th, 2021. Carlos Pérez-Estrada. General introduction to coarse geometry and algebraic topology and index theoretical invariants. The main aim is to popularize ideas from coarse geometry, and K- homological and K- theoretical invariants for them, after Higson and Roe.
- August 23rd, 2021. Carlos Pérez-Estrada. Rigidity and non-rigidity of infinite genus surfaces via coarse algebraic topological invariants.

(ii) Finiteness properties of discrete groups and algebraic topology computations for the moduli of Riemann Surfaces.
- August 30th. General Introduction: Finiteness properties of the mapping class group compared to cohomological dimensions of the moduli space.
- September 7th. Computations of algebraic topological invariants for the Mapping class group and the moduli of Riemann surfaces.

(iii) September 13rd. No sesion due to CLAM-Online congress

(iv) September 20th. Guest talk.

(v) Random walks in groups and the Poisson-Furstenberg boundary. The main aim is the understanding of a seminal paper in the theory of random walks in groups in intersection with ideas from armonic analysis in homogeneous spaces of semisimple Lie groups. We will be reading the seminal work of H. Furstenberg [Furstenberg(1971)].
- September 27th , 2021 Informal introduction to Poisson-Furstenberg boundary and the problems that motivated its introduction (sections (i) and (ii) from [Furstenberg(1971)], pp. 3-10). Noé Bárcenas.
- October 4th, 2021. Preliminars in probability and boundaries (sections (iii.1)-(iii.3) from [Furstenberg(1971)], pp. 10-18). Rogelio Niño.
- October 11th, 2021. Formal definition and existence of Poisson-Furstenberg boundary (sections (iii.4)-(iii.5) from [Furstenberg(1971)], pp. 19-25). Manuel Sedano.
- October 18th, 2021. Examples of Poisson-Furstenberg boundaries in free groups (sections (iv.1)-(iv.3) from [Furstenberg(1971)], pp. 25-32). Manuel Kany .
- Octuber 25th, 2021. Poisson-Furstenberg boundary for semisimple groups, its lattices and symmetric spaces (sections (iv.4)-(iv.6) and (v) from [Furstenberg(1971)], pp. 35-57). Manuel Sedano.

(vi) November 8th ,2021 Measure partition problems and algebraic topology of homogeneous spaces. Jaime Calles.

References

[Furstenberg(1971)] Harry Furstenberg. Random walks and discrete subgroups of Lie groups. In *Advances in Probability and Related Topics, Vol. 1*, pages 1–63. Dekker, New York, 1971.

Email address: barcenas@matmor.unam.mx

URL: http://www.matmor.unam.mx /~barcenas

Email address: msedano@matmor.unam.mx

Centro de Ciencias Matemáticas. UNAM, Ap.Postal 61-3 Xangari. Morelia, Michoacán MEXICO 58089