Graduate

Dynamical Systems Seminar

Geometria e Topologia da Fibração de Hopf

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14:15 Horas

Place: https://tinyurl.com/yyll23fh
(MS Teams Videoconference)

Abstract. In this lecture we will present the results of my master's dissertation at MAT-UnB. The purpose of this dissertation is to recover the geometric intuition behind the celebrated Hopf $h : S^3 \ to S^2$. Over time, this intuition seems to have been overlooked in modern exhibitions, favoring only the topological or algebraic side.

We begin by recalling the history of the discovery of Hopf fibration: the first map between spheres $S^m \to S^n$, $m > n$, not homotopic to a constant.

Then, we investigated the geometry of Clifford Parallelism in S^3, used by Hopf to discover the topological properties of its fibration.

Finally, we investigate the topology of the Hopf fibration, using tools from the homotopy theory of fiber bundles, due to Hurewicz, to prove that it is not homotopic to a constant.

It is worth noting that Hurewicz's tools came after Hopf's discovery. However, Hopf's discovery was the starting point for the development of these and other tools, giving rise to the modern theory of homotopy. (Hopf's invariant, the tool created by Hopf for this discovery, will be discussed in another lecture of this Seminar)

Referências

[1] SAMELSON, H.: $\pi^3(S^2)$, *H. Hopf, W. K. Clifford, F. Klein*, In: History of Topology.Elsevier Science, 1999. p. 575–578.

[2] DE BRITO, G. C.: *Geometria e Topologia da Fibração de Hopf*, Master's Thesis advised by Prof. Lucas Seco, Department of Mathematics, University of Brasília, September 2020.

More info at the WhatsApp group of the Dynamical Systems Seminar:
https://chat.whatsapp.com/HbF8Gf4Vz05FP32oI8lxoJ