

5007-55-405

Oscar Ocampo Uribe* (oeocampo@gmail.com), Departamento de Matemática, IME-USP, Rua do Matão 1010, Cidade Universitária, São Paulo, SP 05508-090, Brazil. *Brunnian braids over surfaces and the homotopy groups of S^2 .*

One of the fundamental problems in algebraic topology is to study the homotopy groups of spheres, and in general they are unknown. In this work we will generalize Theorem 1.2 of [1], relating braids over any surface and the homotopy groups $\pi_*(S^2)$. Furthermore, independently of [1], we can construct an explicit isomorphism

$$\psi_{n+1} : Brun_{n+1}(S^2) \rightarrow Brun_n(D^2) \cap Ker(f_* : P_n(D^2) \rightarrow P_n(S^2))$$

for $n \geq 4$, where $f : D^2 \hookrightarrow S^2$ is the inclusion and $Brun_n(M)$ denote the Brunnian braid group over M , and then we will reprove the Theorem 1.2 of Cohen et al. using an alternative approach. This work was supported by FAPESP, project number 2008/58122-6.

Key words: Surface braids, Brunnian braids, simplicial groups, homotopy groups of spheres

References

- [1] Berrick J. A., Cohen F. R., Wong Y. L., and Wu J. *Braids, configurations and homotopy groups*. J. Amer. Math. Soc. 19 (2006), 265-326.
- [2] Li J. Y. and Wu J. *Artin braid groups and homotopy groups*. Proc. London Math. Soc. 99, 3 (2009), 521-556.
- [3] Wu, J. *Combinatorial descriptions of the homotopy groups of certain spaces*. Proc. Camb. Phil. Soc. 130 (2001), 489-513.

(Received May 13, 2013)