

# (ORBIT) CONFIGURATION SPACES AND HOMOTOPY FIBRES

JOHN GUASCHI

*Laboratoire de Mathématiques Nicolas Oresme UMR CNRS 6139, Université de Caen  
Normandie*

*Email : john.guaschi@unicaen.fr*

ABSTRACT. We study some topological aspects of configuration spaces. If  $M$  is a surface, the fundamental group of the  $n^{\text{th}}$  configuration spaces  $F_n(M)$  is the  $n$ -string pure braid group  $P_n(M)$  of  $M$ . In the cases where  $M$  is the 2-sphere  $\mathbb{S}^2$  or the real projective plane  $\mathbb{R}P^2$ ,  $F_n(M)$  is particularly interesting, since its higher homotopy groups coincide with those of  $\mathbb{S}^2$  (and  $\mathbb{S}^3$ ). We study the natural inclusion  $\iota$  of  $F_n(M)$  into the  $n$ -fold Cartesian product  $M^n$ , and we prove that its homotopy fibre is the Cartesian product of an (orbit) configuration space with a product of loop spaces of  $\mathbb{S}^2$ . This enables us to determine the homomorphisms that occur in the long exact sequence of the homotopy fibration of  $\iota$ . This is joint work with Daciberg Gonçalves (São Paulo).