# ABSTRACTS FOR THE WORKSHOP ON STRING TOPOLOGY AND RELATED TOPICS

## Somnath Basu, Transverse strings, knots and configuration spaces

A loop in $M$ can be thought of as a closed arc in $M \times M$ with end points in the diagonal. We define the space of transversal open strings, a subspace of free loops thought of as closed arcs. We then analyze algebraic structures on such strings. On one hand, we recover interesting invariants in the case of knots. On the other hand, we relate this new structure to the Pontrjagin product on the based loop space of configuration spaces, which we show is not a homotopy invariant.

## Dan Berwick-Evans, Two dimensional Yang–Mills theory and string topology of classifying spaces

String topology of classifying spaces can be seen as a particular generalization of a topological limit of 2-dimensional Yang–Mills theory. We will begin by reviewing 2-dimensional Yang–Mills theory as a fully extended (but not topological) field theory. A parallel construction leads to a cocycle-level description of the string topology of classifying spaces of Lie groups. This is joint work with D. Pavlov.

## Luc Menichi, Eilenberg–Moore spectral sequence and string topology

Let $M$ be a simply-connected closed manifold. Chas and Sullivan have defined a product on the shifted homology of the free loop space $\mathbb{H}_*(LM)$. Consider over any field, the usual homological Eilenberg-Moore spectral sequence converging to $H_*(LM)$. Using results of Félix and Thomas, we show that this spectral sequence is multiplicative with respect to the Chas–Sullivan loop product and that its $E_2$-term is the Hochschild cohomology of $H^*(M)$. This gives a new method to compute the loop homology algebra of spheres and complex projective spaces. This is joint work with K. Kuribayashi and T. Naito.

## Kate Poirier, Compactified combinatorial string topology

Constructions producing various string topology operations on the homology of the free loop space of a manifold have been known for some time. The constructions of Godin and Kupers use combinatorial models for the moduli space of Riemann surfaces with boundary as the space of such operations. In particular, this moduli space is non-compact. It is expected that the algebraic structure induced by these operations is the shadow of a richer structure induced by operations on the chains of the free loop space, and these operations are parametrized by a compactification of moduli space. In this talk, we introduce a compact cell complex of operations that parametrize operations on the singular chains and describe its relationship with moduli space. This is joint work in progress with Gabriel C. Drummond-Cole and Nathaniel Rounds.