ABSTRACTS 1.2

TOM BAIRD
University of Toronto

Moduli spaces of flat connections over nonorientable surfaces

We will explore the topology of the moduli space of flat SU(2)-connections over a nonorientable surface S. This space may be identified with the representation variety of homomorphisms $Hom(\pi_1 S, SU(2))$ modulo conjugation by SU(2). In particular, the equivariant cohomology of $Hom(\pi_1 S, SU(2))$ proves interesting and useful. If time permits, we will describe possible generalizations to other Lie groups.

GEORG BIEDERMANN
University of Western Ontario

Homotopy n-nilpotent groups

We define homotopy n-nilpotent groups using the language of simplicial algebraic theories. They interpolate between loop spaces and infinite loop spaces. By applying π_0 we obtain the ordinary theory of n-nilpotent groups. We also explain the relation to the Goodwillie tower of the identity. (joint with Bill Dwyer)

FRED COHEN
University of Rochester

Interactions between moment-angle complexes and classifying spaces

This survey lecture is at the interface of (1) moment-angle complexes (in joint work with Tony Bahri, Martin Bendersky, and Sam Gitler) and (2) spaces of commuting n-tuples in a Lie group (in joint work with Alejandro Adem and Enrique Torres-Giese). Emphasis will be on "how and where" some of these structures "fit".

DON DAVIS
Lehigh University

From invariant theory to homotopy groups

Each p-compact group is determined by the action of a reflection group. We show how the invariant polynomials of this action lead to the v1-periodic homotopy groups of the space. We will discuss the status of a project to determine v1-periodic homotopy groups of all p-compact groups.

NAN-KUO HO
National Cheng-Kung University

Yang-Mills connections over a nonorientable surface

Atiyah and Bott studied Yang-Mills functional over a Riemann surface from the point of view of Morse theory. We generalize their study to all closed, compact, connected, nonorientable surfaces.

This is joint work with Chiu-Chu Melissa Liu.

LISA JEFFREY
University of Toronto

Connectedness of moment maps on based loop groups

If G is a compact connected simply connected Lie group, the loop group LG is the collection of maps from S^1 to G. The space of based loops ΩG is a homogeneous space of LG and has a natural action of $T \times S^1$, where T is the maximal torus of G.

Atiyah and Pressley proved that the image of this moment map is convex. Their proof did not follow the structure of the proof of the convexity theorem for torus actions on symplectic manifolds (Atiyah; Guillemin-Sternberg) where a key step is to prove that level sets of the moment map are connected. In this talk I outline our proof that in this situation these level sets are indeed connected.

(Joint work with Megumi Harada, Tara Holm and Liviu Mare)

DAVID KLEIN
University of Toronto

Goldman flows on the moduli space of flat $SU(2)$-connections over a nonorientable surface.

The Goldman flow for a compact oriented surface is an S^1-action on the moduli space of flat $SU(2)$-connections modulo gauge transformations, which is defined as the Hamiltonian flow of a certain Hamiltonian function. We generalize this construction and define the Goldman flow for nonorientable sufaces. We then describe how the flow on a compact nonorientable surface is related to the flow on its oriented double cover.

DEREK KREPSKI
University of Toronto

Obstruction to Pre-quantization

For a simply connected, compact, simple Lie group G, the moduli space of flat G-bundles over a closed surface is known to be pre-quantizable at integer levels. For non-simply onnected G, however, integrality of the level is not sufficient, and this talk reveals the obstruction as a certain cohomology class in $H^3(G^2; Z)$.

(The definitions of 'level' and 'pre-quantization' will be reviewed, and will not be obstructions to understanding the talk.)

JONATHAN SCOTT
University of Ottawa

"The category of Lie-infinity algebras via co-rings over operads."

While operads are considered to be the proper way to describe algebra structures up to homotopy, they cannot describe morphisms up to homotopy. We describe how co-rings over operads rectify the situation. The specific case of the Lie operad is discussed.

This is joint work with Kathryn Hess (EPFL).

PAUL SELICK
University of Toronto

Anick's fibration: 15 years later

Around 1980, work of Cohen, Moore, and Neisendorfer on the bound on the p-torsion in the homotopy groups of spheres suggested that after localization at an odd prime, there ought to be a fibration $S^{2n-1} \to X \to \Omega S^{2n+1}$ in which the bottom 3-cells of X form an odd primary analogue of the tangent bundle to S^{2n}.

In 1992 Anick produced a 250-page manuscript full of intense calculations which gave a construction of this fibration. Recently, a method of Steve Theriault, with enhancements by Brayton Gray, has succeeded in giving a much more conceptual and intuitive construction of this fibration.