

报告题目和摘要

报告人: 吕志 (复旦大学)

题目: Projectivization of manifolds up to cobordism

摘要: A smooth closed manifold is said to be projectivizable if it is cobordant to a projective space bundle. We will see that there is always a representative of each generator for unoriented and unitary bordism rings such that it is projectivizable. In the equivariant case, the problem seems to be interesting and complicated. We will show some progresses and open problems.

报告人: 古星 (西湖大学)

题目: Chern classes of the conjugation representations and invariant polynomials

摘要: The theory of characteristic classes of the projective unitary group $PU(n)$ is fundamental yet very mysterious as of today. We will review recent progresses on the study on this topic, and consider the Chern classes γ_i of the conjugation representation of the projective unitary group $PU(p^l)$, where p is an odd prime. We show that the restriction of γ_i on a maximal elementary abelian p subgroup are expressed as Dickson invariants, a collection of polynomial in $\mathbb{F}_p[x_1, \dots, x_n]$ invariant under the action of $GL_n(\mathbb{F}_p)$. Furthermore, we present some relations in the cohomology algebra $H^*(BPU(p^l); \mathbb{F}_p)$ involving the classes γ_i .

报告人: 朱中坚 (温州大学)

题目: 多胞腔复形非稳定同伦群计算的一些进展

摘要: 有限 CW-复形同伦群的计算是代数拓扑中一个最基本且困难的问题。对于胞腔个数大于等于 2 的复形, 上述问题归结为: 对 $(m-1)$ -连通复形 $X = Y \cup e^n$ ($n \geq m$), 如何从已知 $\pi_*(Y)$ 计算 $\pi_*(X)$ 。传统的两种一般性计算方法是利用 I. M. James 1954 年给出的空间偶 (X, Y) 一定维数范围的同伦群正合列以及 B. Gray 1970 年利用 Relative James construction 对自然投射 $X \rightarrow S^n$ 同伦纤维伦型的刻画的方法。然上述两种方法只能计算 X 的维数不超过 $2n + m - 4$ 的同伦群。本报告将介绍我们最近进一步发展了 B. Gray 关于映射锥空间同伦群计算的方法, 从而得到计算 X 同伦群维数超过 $2n + m - 4$ 的一般性方法。通过我们的计算, 目前较多的 2 胞腔复形利用该新方法, 同伦群计算维数至少可达 $3n + m - 4$ 。

报告人: 邹燕清 (华东师范大学)

题目: Distance two Heegaard splittings

摘要: By Hempel's result and Geometrization theorem, a distance at least 3 Heegaard splitting is of a hyperbolic 3-manifold. Then a natural question is: what's the geometry of a distance at most two Heegaard splitting. In this talk, we will share our recent result on distance two Heegaard splittings. This is a joint work with Wenjie Diao and Ruifeng Qiu.

报告人: 王伟飏 (中南大学)

题目: Embeddability of non-orientable closed surfaces in 3-manifolds

摘要: We know that non-orientable closed surfaces can not be embedded in the 3-sphere. Naturally, we ask for a given 3-manifold which non-orientable closed surfaces can be embedded in it. For any lens space, or the product of any surface and the circle, the answer is known, mainly by the work of Bredon and Wood, as well as those of Jaco, End, Rannard, and so on. I will review their results, and then discuss the embeddability of non-orientable closed surfaces in surface bundles over the circle, especially torus bundles over the circle.

报告人: 刘永强 (中国科学技术大学)

题目: BNSR invariants and the tropical variety of jump loci

摘要: Papadima and Suciu studied the relationship between the Bieri-Neumann-Strebel-Renz (short as BNSR) invariants of a space and its homology jump loci of rank one local systems. Recently, Suciu improved these results using the tropical variety associated to the homology jump loci of complex rank one local systems. In particular, the translated positive-dimensional component of homology jump loci can be detected by its tropical variety. In this paper, we extend Suciu's results to any field coefficients and integer coefficients, hence get better upper bounds for the BNSR invariants.

报告人: 周正一 (中科院数学所)

题目: Morse Bott theory from homological perturbation

摘要: I will explain the role of the homological perturbation lemma in constructions of Morse-Bott cohomology both in Morse theory and Floer theory context.

报告人: 贺琛 (华北电力大学)

题目: Cohomogeneity-one manifold and the graph of dihedral group

摘要: A manifold M acted on by a Lie group G with 1-dimensional orbit space M/G is called a cohomogeneity-one manifold, in contrast to a homogeneous space M' with orbit space M'/G a point. Nevertheless, cohomogeneity-one manifolds are built on homogeneous spaces, hence they have many topological properties in common. Previously, in a joint paper, we have determined the Borel equivariant cohomology of a cohomogeneity-one manifold using the representation theoretic aspects of dihedral groups. In this talk, I will consider the graph theoretic aspects of dihedral groups which act freely on graphs describing the equivariant cohomology of a homogeneous space, and construct the graphs associated with cohomogeneity-one manifolds.