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Symplectic Cobordism and the Computation of Stable Stems

Stanley O. Kochman



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Symplectic Cobordism Ring

**David M. Bressoud, Maynard
Arsove, Michel Cahen**



Symplectic Cobordism Ring:

The Symplectic Cobordism Ring II Stanley O. Kochman, 1982 This paper is the second of three which investigate the ring of cobordism classes of closed smooth manifolds with a symplectic structure on their stable normal bundle The method of computation is the Adams spectral sequence In this paper the d_3 differentials are computed by Landweber Novikov and Massey product methods In addition cup one products are introduced in the theory of bordism chains and a complex is constructed to represent an Adams spectral sequence

The Symplectic Cobordism Ring III Stanley O. Kochman, 1990
Analytic and Combinatorial Generalizations of the Rogers-Ramanujan Identities David M. Bressoud, Maynard Arsove, Michel Cahen, 1980

Symplectic Cobordism and the Computation of Stable Stems Stanley O. Kochman, 1993 This memoir consists of two independent papers In the first The symplectic cobordism ring III the classical Adams spectral sequence is used to study the symplectic cobordism ring capital Greek Omega superscript over subscript italic capital S subscript italic p In the second The symplectic Adams Novikov spectral sequence for spheres we analyze the symplectic Adams Novikov spectral sequence converging to the stable homotopy groups of spheres

Complex Cobordism and Stable Homotopy Groups of Spheres Douglas C. Ravenel, 2023-02-09 Since the publication of its first edition this book has served as one of the few available on the classical Adams spectral sequence and is the best account on the Adams Novikov spectral sequence This new edition has been updated in many places especially the final chapter which has been completely rewritten with an eye toward future research in the field It remains the definitive reference on the stable homotopy groups of spheres The first three chapters introduce the homotopy groups of spheres and take the reader from the classical results in the field though the computational aspects of the classical Adams spectral sequence and its modifications which are the main tools topologists have to investigate the homotopy groups of spheres Nowadays the most efficient tools are the Brown Peterson theory the Adams Novikov spectral sequence and the chromatic spectral sequence a device for analyzing the global structure of the stable homotopy groups of spheres and relating them to the cohomology of the Morava stabilizer groups These topics are described in detail in Chapters 4 to 6 The revamped Chapter 7 is the computational payoff of the book yielding a lot of information about the stable homotopy group of spheres Appendices follow giving self contained accounts of the theory of formal group laws and the homological algebra associated with Hopf algebras and Hopf algebroids The book is intended for anyone wishing to study computational stable homotopy theory It is accessible to graduate students with a knowledge of algebraic topology and recommended to anyone wishing to venture into the frontiers of the subject

Bordism, Stable Homotopy and Adams Spectral Sequences Stanley O. Kochman, 1996 This book is a compilation of lecture notes that were prepared for the graduate course Adams Spectral Sequences and Stable Homotopy Theory given at The Fields Institute during the fall of 1995 The aim of this volume is to prepare students with a knowledge of elementary algebraic topology to study recent developments in stable homotopy theory such as the nilpotence and periodicity theorems

Suitable as a text for an intermediate course in algebraic topology this book provides a direct exposition of the basic concepts of bordism characteristic classes Adams spectral sequences Brown Peterson spectra and the computation of stable stems The key ideas are presented in complete detail without becoming encyclopedic The approach to characteristic classes and some of the methods for computing stable stems have not been published previously All results are proved in complete detail Only elementary facts from algebraic topology and homological algebra are assumed Each chapter concludes with a guide for further study

Canadian Journal of Mathematics, 1994-06 **Moment Maps, Cobordisms, and Hamiltonian Group Actions** Victor Guillemin, Viktor L. Ginzburg, Yael Karshon, 2002 During the last 20 years localization has been one of the dominant themes in the area of equivariant differential geometry Typical results are the Duistermaat Heckman theory the Berline Vergne Atiyah Bott localization theorem in equivariant de Rham theory and the quantization commutes with reduction theorem and its various corollaries To formulate the idea that these theorems are all consequences of a single result involving equivariant cobordisms the authors have developed a cobordism theory that allows the objects to be non compact manifolds A key ingredient in this non compact cobordism is an equivariant geometrical object which they call an abstract moment map This is a natural and important generalization of the notion of a moment map occurring in the theory of Hamiltonian dynamics The book contains a number of appendices that include introductions to proper group actions on manifolds equivariant cohomology Spin \mathfrak{c} structures and stable complex structures It is geared toward graduate students and research mathematicians interested in differential geometry It is also suitable for topologists Lie theorists combinatorists and theoretical physicists Prerequisite is some expertise in calculus on manifolds and basic graduate level differential geometry

Normal Structures and Bordism Theory, with Applications to MSp Nigel Ray, Robert M. Switzer, Larry Taylor, 1977 In the first of these three papers we discuss the problem of enumerating the bordism classes which can be carried on a fixed manifold by means of varying its normal structure The main application is to Sp structures on Alexander's family of manifolds and is presented in the third paper The middle paper collects together the requisite definitions and calculations

Canadian Journal of Mathematics, 1994-06 *Algebraic Topology*. Waterloo 1978 P. Hoffman, V. Snaith, 2006-11-15 Adams Memorial Symposium on Algebraic Topology: Volume 2 Nigel Ray, 1992-05-07 J Frank Adams had a profound influence on algebraic topology and his work continues to shape its development The International Symposium on Algebraic Topology held in Manchester during July 1990 was dedicated to his memory and virtually all of the world's leading experts took part This two volume work constitutes the proceedings of the symposium the articles contained here range from overviews to reports of work still in progress as well as a survey and complete bibliography of Adams's own work These proceedings form an important compendium of current research in algebraic topology and one that demonstrates the depth of Adams's many contributions to the subject This second volume is oriented towards homotopy theory the Steenrod algebra and the Adams spectral sequence In the first volume the theme is mainly

unstable homotopy theory homological and categorical Manifolds with Singularities and the Adams-Novikov Spectral Sequence Boris I. Botvinnik, 1992-07-23 Many interesting results not widely known outside the USSR are brought together in this analysis of the Adams Novikov spectral sequence a tool that has enabled the computation of generators and relations to describe homotopy groups Canadian Mathematical Bulletin , 1995-09 **Quantization of Symplectic Cobordisms** Levente Korpás, 1999 Homotopy Theory: An Introduction to Algebraic Topology , 1975-11-12 Homotopy Theory An Introduction to Algebraic Topology **Global Dynamics, Phase Space Transport, Orbits Homoclinic to Resonances, and Applications** Stephen Wiggins, This monograph which grew out of a series of lectures delivered by Stephen Wiggins at the Fields Institute in early 1993 is concerned with the geometrical viewpoint of the global dynamics of nonlinear dynamical systems With appropriate examples and concise explanations Wiggins unites many different topics into one volume and makes a unique contribution to the field Engineers physicists chemists and mathematicians who work on issues related to the global dynamics of nonlinear dynamical systems will find these lectures very useful **Topological Library - Part 1: Cobordisms And Their Applications** Serguei Petrovich Novikov, Iskander A Taymanov, 2007-07-09 This is the first of three volumes collecting the original and now classic works in topology written in the 50s 60s The original methods and constructions from these works are properly documented for the first time in this book No existing book covers the beautiful ensemble of methods created in topology starting from approximately 1950 that is from Serre s celebrated Singular homologies of fibre spaces This is the translation of the Russian edition published in 2005 with one entry Milnor s lectures on the h cobordism omitted Stable Homotopy Groups of Spheres Stanley O. Kochman, 2006-11-14 A central problem in algebraic topology is the calculation of the values of the stable homotopy groups of spheres S In this book a new method for this is developed based upon the analysis of the Atiyah Hirzebruch spectral sequence After the tools for this analysis are developed these methods are applied to compute inductively the first 64 stable stems a substantial improvement over the previously known 45 Much of this computation is algorithmic and is done by computer As an application an element of degree 62 of Kervaire invariant one is shown to have order two This book will be useful to algebraic topologists and graduate students with a knowledge of basic homotopy theory and Brown Peterson homology for its methods as a reference on the structure of the first 64 stable stems and for the tables depicting the behavior of the Atiyah Hirzebruch and classical Adams spectral sequences through degree 64 **Topology I** S.P. Novikov, 2013-06-29 Introduction In the present essay we attempt to convey some idea of the skeleton of topology and of various topological concepts It must be said at once that apart from the necessary minimum the subject matter of this survey does not include that subdiscipline known as general topology the theory of general spaces and maps considered in the context of set theory and general category theory Doubtless this subject will be surveyed in detail by others With this qualification it may be claimed that the topology dealt with in the present survey is that mathematical subject which in the late 19th century was called Analysis Situs and at various later periods separated

out into various subdisciplines Combinatorial topology Algebraic topology Differential or smooth topology Homotopy theory Geometric topology With the growth over a long period of time in applications of topology to other areas of mathematics the following further subdisciplines crystallized out the global calculus of variations global geometry the topology of Lie groups and homogeneous spaces the topology of complex manifolds and algebraic varieties the qualitative topological theory of dynamical systems and foliations the topology of elliptic and hyperbolic partial differential equations Finally in the 1970s and 80s a whole complex of applications of topological methods was made to problems of modern physics in fact in several instances it would have been impossible to understand the essence of the real physical phenomena in question without the aid of concepts from topology

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new types of. organisms from preexisting types of ...