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Geometry And Topology In Hamiltonian

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Geometry and Topology in Hamiltonian Dynamics and ...
Geometry and Topology in Hamiltonian Dynamics and Statistical Mechanics February 5, 2008 Springer 1 Introduction This book reports on an unconventional explanation of the origin of chaos in Hamiltonian dynamics and on a new theory of the origin of thermodynamic phase transitions The mathematical concepts and methods used are borrowed
Geometry and topology in many-body physics
conditions fixed and “twisting” the Hamiltonian; other authors [6] have addressed the many-body geometry by keeping the Hamiltonian fixed, and “twisting” the boundary conditions
Symplectic and Contact Geometry and Hamiltonian Dynamics
By now, symplectic/contact geometry/topology and the related aspects of Hamiltonian dynamics have turned into a vast and °ourishing branch of mathemat-ics which can deflnitely not be surveyed during 45 hours of the mini-symposium The contributions collected here should therefore be …
arXiv:math/0402210v1 [math.SG] 13 Feb 2004

THE GROUP OF HAMILTONIAN HOMEOMORPHISMS AND C0 SYMPLECTIC TOPOLOGY Yong-GeunOh1 January, 2004 Abstract The main purpose of this paper is to carry out some foundational study of C 0Hamiltonian geometry and C symplectic topology We introduce the notions of the strong and the weak Hamiltonian topology on the space of Hamiltonian paths,

Symplectic theory of completely integrable Hamiltonian systems

theory, symplectic geometry and representation theory In this paper we focus on finite dimensional com-pletely integrable Hamiltonian systems (sometimes called “Liouville integrable systems”) in the context of symplectic geometry Many authors have studied dynamical problems for centuries Galileo made great advances to the sub-

Symplectic Topology and Geometric Quantum Mechanics

Hamiltonian dynamical system, with a projective Hilbert space regarded as the phase space This thesis extends the theory by including some aspects of the symplectic topology of the quantum phase space It is shown that the quantum mechanical uncertainty principle is a special case of an inequality from J-holomorphic map theory, that is, J

Symplectic Geometry and its Applications

geometry clears up and systematizes the relations between the quantities entering into the theory Symplectic geometry simplifies and makes perceptible the frightening formal apparatus of Hamiltonian dynamics and the calculus of variations in the same way that the ordinary geometry …

Topology, geometry and quantum interference in condensed …

Topology, geometry and quantum interference in condensed matter physics Alexander G Abanov Department of Physics and Astronomy and Simons Center for Geometry and Physics, Hamiltonian the smaller is the mass of \Goldstone" particles One can proceed with the derivation

Differential Geometry, Analysis and Physics

differential geometry, topology and global analysis is even more pronounced in the newer quantum theories such as gauge field theory and string theory The amount of mathematical sophistication required for a good understanding of modern physics is astounding On the other hand, the philosophy of …

Symplectic Topology and Floer Homology

5 Hofer’s geometry of Ham(M,ω) 130 51 Normalization of Hamiltonians 130 52 Invariant norms on C∞(M) and the Hofer length 135 53 The Hofer topology of Ham(M,ω) 137 54 Nondegeneracy and symplectic displacement energy 139 55 Hofer’s geodesics on Ham(M,ω) 143 6 C0-Symplectic topology and Hamiltonian dynamics 146 61 C0 symplectic

FIRST STEPS IN SYMPLECTIC AND SPECTRAL THEORY OF …

geometry, and topology of the system The picture shows a singular foliation near a singular leaf Λ 0 of an integrable system (H 1, H 2): R4 → R2 given by two Hamil-tonians H 1: R4 → R and H 2: R4 → R The point m is a singularity of so called focus-focus type The point A denotes a …

Quantitative symplectic geometry

Contact geometry originated in geometrical optics A con-tact manifold P;¸/ is a 2n 1/-dimensional manifoldP endowed with a 1-form¸ such that ¸^d¸/n 1 is a volume form on P The vector field X on P defined by d¸X; /D0and ¸X/D1generates the so-called Reeb flow The restriction of a time-independent Hamiltonian system to anenergy

Homotopy properties of Hamiltonian group actions

Geometry & Topology Volume 9 (2005) 121–162 Published: 28 December 2004 Homotopy properties of Hamiltonian group actions Jarek Ke¸dra Dusa

McDuff Institute of Mathematics US, Wielkopolska 15, 70-451 Szczecin, Poland and Mathematical Institute Polish Academy of Sciences Sniadeckich 8, 00-950 Warszawa, Poland´ and

Deformation quantisation of Poisson manifolds

on the Hilbert space The dynamics is defined in terms of a Hamiltonian H, which is a self-adjoint operator, and the time evolution of an observable At is governed by the equation dAt dt D i — „H;At“: Geometry & Topology Monographs, Volume 17 (2011)

Symplectic Topology as the Geometry of Action Functional ...

submanifolds and Hamiltonian systems Hence our Floer theory can be considered as "geometry of action functional" while Floer's original (global) theory in the literature as "topology of action functional" This optimal cal- culation has been crucial for applications to problems in symplectic topology,

Applications of Poisson geometry to physical problems

Geometry & Topology Monographs 17 (2011) 221–384 221 Applications of Poisson geometry to physical problems DARRYL D HOLM These being lecture notes for a summer school, one should not seek original material in them Rather, the most one could hope to find would be the insight arising from

Symplectic Topology, Geometry and Gauge Theory Lisa Jeffrey

Symplectic geometry has its roots in classical mechanics A prototype for a symplectic manifold is the phase space which parametrizes the position q and momentum p of a classical particle If the Hamiltonian (kinetic + potential en-ergy) is H = p2 2 +V(q) then the motion of the particle is described by Hamilton’s equations dq dt = ∂H ∂p

Symplectic Topology and Floer Homology

202 Hamiltonian fibrations with prescribed monodromy 289 203 The PSS map and its isomorphism property 299 204 Frobenius pairing and duality 312 21 Spectral invariants: construction 314 211 Energy estimates and Hofer’s geometry 315 212 The boundary depth of the Hamiltonian H 322 213 Definition of spectral invariants and their axioms 324

Lectures on Symplectic Geometry

plectic geometry at MIT, I was lucky enough to experience as a graduate student I am very thankful to him! That course also borrowed from the 1997 Park City summer courses on symplec-tic geometry and topology, and from many talks and discussions of the symplectic geometry group at MIT Among the regular participants in the MIT informal sym-