Notes On De Sitter Space

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General Theory of Relativity 12.1 - De Sitter and Anti- de Sitter*de Sitter's Observations - Intro to Physics The Holographic Universe Explained* Anti-de Sitter space from finite spin networks AdS/CFT Correspondence, Part 1 - Juan Maldacena *The Biggest Questions of Cosmology: Pondering the Imponderables* A Philosophical Tour of de Sitter Spacetime | Gordon Belot ~~Sean Carroll, \"Fluctuations in de Sitter Space\" FQXi conference 2014 in Vieques~~ ~~Spacetime Continuum DOCUMENTARY The Secret Structure That Controls Our Universe~~ **Aspect of De Sitter Space (Lecture - 01) by Dionysios Anninos** Leonard Susskind - Eternal Inflation \u0026 De Sitter Space*Gary Horowitz: Cosmic Censorship in anti-de Sitter Spacetime* **5 Theories About The Universe That Will Blow Your Mind** 5 REAL Possibilities for Interstellar Travel Why is the universe flat? **Minkowski Space-Time: Spacetime in Special Relativity** *How Large is the Universe?* Quantum Gravity and the Hardest Problem in Physics | Space Time **What Is The Shape of Space? (ft. PhD Comics)** Classroom Aid - Space-Time Minkowski Space anti de Sitter space - RsM (original) **This thing is -270°C and is EVERYWHERE** *General Theory of Relativity 12.6 - Geometry of the Anti–de Sitter Space-Time Penrose Inequality in Anti de Sitter Space* de Sitter Space, Maulik Parikh | Lecture 1 of 1 *Aspect of De Sitter Space (Lecture - 02) by Dionysios Anninos* ~~de Sitter and anti de Sitter spacetimes~~ Episode 2: Carlo Rovelli on Quantum Mechanics, Spacetime, and Reality **General Theory of Relativity 12.3 - Metric of the de Sitter Space-Time General Theory of Relativity 12.2 - Geometry of the de Sitter Space-Time** ~~Notes On De Sitter Space~~
de Sitter spacetime is the maximally symmetric spacetime of constant positive curva- ture. It is a solution of the vacuum Einstein equations with a positive cosmological constant. It is directly relevant for observation, in two (as fas as we know unrelated!) ways.

~~Lecture Notes on Classical de Sitter Space~~
de Sitter space is the subset deS = fhx;xi= a2 jx 2M5g: There is an isometric copy H4 q of hyperbolic space with x 0 <0. The induced metric on hyperbolic space is Riemannian and on de Sitter space is Lorentzian. Thus de Sitter space is a space-time. It is a solution of Einstein's equations with positive cosmological constant = 3=a2 and no matter.

~~Notes on de Sitter space~~
In mathematical physics, n-dimensional de Sitter space is a maximally symmetric Lorentzian manifold with constant positive scalar curvature. It is the Lorentzian analogue of an n-sphere. The main application of de Sitter space is its use in general relativity, where it serves as one of the simplest mathematical models of the universe consistent with the observed accelerating expansion of the universe. More specifically, de Sitter space is the maximally symmetric vacuum solution of Einstein's fie

~~de Sitter space - Wikipedia~~
Notes on Euclidean de Sitter space - NASA/ADS Note that de Sitter space has an initial and ?nal conformal boundary. (Although the diagram also appears to have left and right boundaries, these are not really boundaries – at each value of ? space is a sphere, so those lines are just the north and south poles of the sphere SD1.)

~~Notes On De Sitter Space~~
can always "unwrap" the hyperboloid by going to the covering space. Note that in 1 + 1 dimensions we can always switch the meaning of timelike and spacelike. Then we obtain de Sitter space dS2, that has a closed space but no closed timelike curves. In general the topology of adSn is Rn?1 ?S1 and the topology of dSn is Sn?1 ?R, so that it is only in two dimensions that de 4

~~ANTI-DE SITTER SPACE~~
Note that de Sitter space has an initial and ?nal conformal boundary. (Although the diagram also appears to have left and right boundaries, these are not really boundaries – at each value of ? space is a sphere, so those lines are just the north and south poles of the sphere SD1.) Vacuum As usual, there is no unique vacuum.

~~7 Thermodynamics of de Sitter space - hartmanhep.net~~
There are ways to cast de Sitter space with static coordinates (see de Sitter space), so unlike other FLRW models, de Sitter space can be thought of as a static solution to Einstein's equations even though the geodesics followed by observers necessarily diverge as expected from the expansion of physical spatial dimensions.

~~de Sitter universe - Wikipedia~~
Acces PDF Notes On De Sitter Space Created by real editors, the category list is frequently updated. Notes On De Sitter Space de Sitter spacetime is the maximally symmetric spacetime of constant positive curva- ture. It is a solution of the vacuum Einstein equations with a positive cosmological constant. It is Page 5/29

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de Sitter space has a number of good properties. It has been shown to be stable [1], and to possess positive en-ergy representations [2] (see [3] for a review of further properties of anti-de Sitter space). Recently, anti-de Sit-ter space has appeared in a surprising new context. Mal-dacena [4] has conjectured that the large N limit of cer-

~~arXiv:hep-th/9805087v1 14 May 1998~~
Just for completeness, note that Anti de Sitter space is the maximally symmetric solution to Einstein's equations with negative cosmological constant. Finally a quick note: de Sitter (Anti de Sitter) space has constant positive (negative) scalar curvature and hence is non-hyperbolic (hyperbolic).

~~General Relativity: What is de Sitter space? Why does it ...~~
It was proved by K. Akutagawa [a1], Q.M. Cheng [a2] and K.G. Ramanathan that complete space-like submanifolds with parallel mean curvature vector in a de Sitter space $ S _ {p} ^ {n + p } (c) $ are totally umbilical (cf. also Differential geometry) if 1) $ H ^ {2} \leq c $, when $ n = 2 $;

~~De Sitter space - Encyclopedia of Mathematics~~
These lectures present an elementary discussion of some background material relevant to the problem of de Sitter quantum gravity. The first two lectures discuss the classical geometry of de Sitter space and properties of quantum field theory on de Sitter space, especially the temperature and entropy of de Sitter space. The final lecture contains a pedagogical discussion of the appearance of ...

~~[hep-th/0110007] Les Houches Lectures on De Sitter Space~~
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Notes on de Sitter space and holography 5657 Keeping the AdS/CFTcorrespondencein mind, we proceed to study the action for scalar ?elds in de Sitter space as a functional of boundary data. To extend this investigation to gravity, we display a family of solutions to three-dimensional (3D) gravity with a positive

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~~Notes On De Sitter Space - e-actredbridgefreeschool.org~~
However, when de Sitter entropy is computed in a `stretched horizon' picture, then we argue that the correct euclidean topology is a solid torus. The solid torus shrinks and degenerates into a three-hemisphere as one goes from the ``stretched horizon'' to the horizon, giving the euclidean continuation of the causal diamond.

~~Notes on Euclidean de Sitter space - NASA/ADS~~
The isometry group of de Sitter space is therefore the Lorentz g roup S O (4 , 1). The em b edding s pace co ordinates a re v ery useful for man y calc ulations. In

~~(PDF) De Sitter Space and Spatial Topology~~
In de Sitter space there is a non-zero probability to pair-produce charged black holes from the vacuum [7, 8, 9, 10, 11, 12, 13]. The two-dimensional FRW regions in the interior of each black hole are produced dynamically, and so black hole nucleation can be regarded as the dynamical compacti?cation of two extra dimensions.

Einstein's theory of general relativity is a theory of gravity and, as in the earlier Newtonian theory, much can be learnt about the character of gravitation and its effects by investigating particular idealised examples. This book describes the basic solutions of Einstein's equations with a particular emphasis on what they mean, both geometrically and physically. Concepts such as big bang and big crunch-types of singularities, different kinds of horizons and gravitational waves, are described in the context of the particular space-times in which they naturally arise. These notions are initially introduced using the most simple and symmetric cases. Various important coordinate forms of each solution are presented, thus enabling the global structure of the corresponding space-time and its other properties to be analysed. The book is an invaluable resource both for graduate students and academic researchers working in gravitational physics.

Providing a pedagogical introduction to the rapidly developing field of AdS/CFT correspondence, this is one of the first texts to provide an accessible introduction to all the necessary concepts needed to engage with the methods, tools and applications of AdS/CFT. Without assuming anything beyond an introductory course in quantum field theory, it begins by guiding the reader through the basic concepts of field theory and gauge theory, general relativity, supersymmetry, supergravity, string theory and conformal field theory, before moving on to give a clear and rigorous account of AdS/CFT correspondence. The final section discusses the more specialised applications, including QCD, quark-gluon plasma and condensed matter. This book is self-contained and learner-focused, featuring numerous exercises and examples. It is essential reading for both students and researchers across the fields of particle, nuclear and condensed matter physics.

The goal of this text is to introduce, in a very elementary way, the concept of anti-de Sitter/Conformal Field Theory (AdS/CFT) correspondence to condensed matter physicists. This theory relates a gravity theory in a (d+1)-dimensional anti-de Sitter space

This thesis focuses on the recent firewall controversy surrounding evaporating black holes, and shows that in the best understood example concerning electrically charged black holes with a flat event horizon in anti-de Sitter (AdS) spacetime, the firewall does not arise. The firewall, which surrounds a sufficiently old black hole, threatens to develop into a huge crisis since it could occur even when spacetime curvature is small, which contradicts general relativity. However, the end state for asymptotically flat black holes is ill-understood since their curvature becomes unbounded. This issue is avoided by working with flat charged black holes in AdS. The presence of electrical charge is crucial since black holes inevitably pick up charges throughout their long lifetime. These black holes always evolve toward extremal limit, and are then destroyed by quantum gravitational effects. This happens sooner than the time required to decode Hawking radiation so that the firewall never sets in, as conjectured by Harlow and Hayden. Motivated by the information loss paradox, the author also investigates the possibility that "monster" configurations might exist, with an arbitrarily large interior bounded by a finite surface area. Investigating such an object in AdS shows that in the best understood case, such an object -- much like a firewall -- cannot exist.

The Euclidean approach to Quantum Gravity was initiated almost 15 years ago in an attempt to understand the difficulties raised by the spacetime singularities of classical general relativity which arise in the gravitational collapse of stars to form black holes and the entire universe in the Big Bang. An important motivation was to develop an approach capable of dealing with the nonlinear, non-perturbative aspects of quantum gravity due to topologically non-trivial spacetimes. There are important links with a Riemannian geometry. Since its inception the theory has been applied to a number of important physical problems including the thermodynamic properties of black holes, quantum cosmology and the problem of the cosmological constant. It is currently at the centre of a great deal of interest.This is a collection of survey lectures and reprints of some important lectures on the Euclidean approach to quantum gravity in which one expresses the Feynman path integral as a sum over Riemannian metrics. As well as papers on the basic formalism there are sections on Black Holes, Quantum Cosmology, Wormholes and Gravitational Instantons.

Since its discovery in 1997 by Maldacena, AdS/CFT correspondence has become one of the prime subjects of interest in string theory, as well as one of the main meeting points between theoretical physics and mathematics. On the physical side, it provides a duality between a theory of quantum gravity and a field theory. The mathematical counterpart is the relation between Einstein metrics and their conformal boundaries. The correspondence has been intensively studied, and a lot of progress emerged from the confrontation of viewpoints between mathematics and physics. Written by leading experts and directed at research mathematicians and theoretical physicists as well as graduate students, this volume gives an overview of this important area both in theoretical physics and in mathematics. It contains survey articles giving a broad overview of the subject and of the main questions, as well as more specialized articles providing new insight both on the Riemannian side and on the Lorentzian side of the theory.

Einstein's General Theory of Relativity leads to two remarkable predictions: first, that the ultimate destiny of many massive stars is to undergo gravitational collapse and to disappear from view, leaving behind a 'black hole' in space; and secondly, that there will exist singularities in space-time itself. These singularities are places where space-time begins or ends, and the presently known laws of physics break down. They will occur inside black holes, and in the past are what might be construed as the beginning of the universe. To show how these predictions arise, the authors discuss the General Theory of Relativity in the large. Starting with a precise formulation of the theory and an account of the necessary background of differential geometry, the significance of space-time curvature is discussed and the global properties of a number of exact solutions of Einstein's field equations are examined. The theory of the causal structure of a general space-time is developed, and is used to study black holes and to prove a number of theorems establishing the inevitability of singualarities under certain conditions. A discussion of the Cauchy problem for General Relativity is also included in this 1973 book.

This book is a printed edition of the Special Issue "Higher Spin Gauge Theories" that was published in Universe

Einstein's Special Relativity (E-SR) is the cornerstone of physics. De Sitter invariant SR (dS/AdS-SR) is a natural extension of E-SR, hence it relates to the foundation of physics. This book provides a description to dS/AdS-SR in terms of Lagrangian-Hamiltonian formulation associated with spacetime metric of inertial reference frames. One of the outstanding features of the book is as follows: All discussions on SR are in the inertial reference frames. This is a requirement due to the first principle of SR theory. The descriptions on dS/AdS-SR in this book satisfy this principle. For the curved spacetime in dS/AdS-SR theory, it is highly non-trivial. Contents:General IntroductionOverview of Einstein's Special Relativity (E-SR)De Sitter Invariant Special RelativityDe Sitter Invariant General RelativityDynamics of Expansion of the Universe in General RelativityRelativistic Quantum Mechanics for de Sitter Invariant Special RelativityDistant Hydrogen Atom in CosmologyTemporal and Spatial Variation of the Fine Structure ConstantDe Sitter Invariance of Generally Covariant Dirac Equation Readership: Students and professionals who are interested in de Sitter and anti-de Sitter invariant Special Relativity. Key Features:This is the first book to describe dS/AdS-SR systematically and comprehensivelyThe crucial contributions to dS/AdS-SR due to Lu–Zou–Guo's work (1970's) are interpreted in detail in this book. The conceptions of dS/AdS-SR Mechanics, dS/AdS-SR Quantum Mechanics, dS/AdS-SR General Relativity, and effects of dS/AdS-SR Cosmology are introduced in the book. In the descriptions, many techniques are involvedThe author, Professor Mu-Lin Yan, is an expert in SR, GR, Black Hole Physics, and Particle Physics. He is one of the discoverers of Nieh–Yan topological identity (1982), High genus solution of Yang–Baxter equation of chiral Potts model (1987), and some unusual hadron's states (2005). He also has contributions to the calculations of entropies of black holes, and to the studies of non-perturbative QCDKeywords:De Sitter Invariant Special Relativity;Special Relativity;De Sitter Group