Lorentzian Wormholes From Einstein To Hawking Aip Series In Computational And Applied Mathematical Physics

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[Lorentzian Wormholes From Einstein To](#)

Lorentzian Wormholes Thermodynamics
Lorentzian Wormholes Thermodynamics (Einstein & Rosen, 1935) Nevertheless, the study of macroscopic wormholes in general relativity was left in some way behind when Fuller and Wheeler (Fuller & Wheeler, 1962) showed the instability of the Einstein-Rosen bridge

On the Construction and Traversability of Lorentzian Wormholes
D The Einstein Equations 4 III Introduction to Untraversable Wormholes 5 A The Schwarzschild metric and the Einstein-Rosen bridge 5 B The Kerr wormhole 7 IV The Morris and Thorne Construction of a Traversable Wormhole 7 A Criteria for traversability 7 B Calculating the Einstein tensor 8 C Analysing the energy-stress tensor 9

One Genuine Wormhole or Einstein-Rose Bridge
Lorentzian wormholes known as Schwarzschild Wormholes or Einstein–Rosen Bridge s are connections between areas of space that can be modeled as vacuum solutions to the Einstein field equations, and that are now understood to be intrinsic parts of the maximally extended version of the Schwarzschild metric describing an eternal black

Curvature Invariants for Lorentzian Traversable Wormholes

used Einstein's general relativistic field equations to explore the possibility of faster-than-light (FTL) interstellar spaceflight without violating special relativity [1,2] Earlier studies demonstrated the possibility of traversable wormholes in general relativity [3,4] A Lorentzian …

Cosmological lorentzian wormholes via noether symmetry …

static wormholes the fluid requires the violation of the null energy condition (NEC), while in Einstein gravity there exists non-static Lorentzian wormholes which do not require weak energy condition (WEC) violating matter to sustain them Such wormholes may exist for arbitrarily small or large intervals of time,23,24 or even satisfy the

The Einstein-Rosen Bridge

Lorentzian wormholes are essentially short cuts through space and time but they instantaneously close unless some form of negative energy can hold them open It is possible to produce small amounts of negative energy in the laboratory by a principle 9 The diagram was taken from Hyperspace by Michio Kaku 10 Wheeler re -christened as a

Thinshellwormholesinhigherdimensiaonal Einstein …

Einstein-Maxwelltheory FRahaman∗, MKalam‡ and SChakraborty† Abstract We construct thin shell Lorentzian wormholes in higher dimensional Einstein-Maxwell theory applying the ' Cut and Paste ' technique proposed by Visser The linearized stability is analyzed under radial perturbations around some assumed

Morris-Thorne wormholes with a cosmological constant

culminated with the publication of the book Lorentzian Wormholes: From Einstein to Hawking by Visser [2], where a review on the subject up to 1995, as well as new ideas are developed and hinted at It is our intention in this introduction to do a brief review on the subject of wormholes…

Two Open Universes Connected by a Wormhole: Exact Solutions

[7]) have shown that a Lorentzian wormhole can be transformed into a time machine (ie, a spacetime with closed timelike curves) Morris and Thorne [8] have also considered the possibility of using Lorentzian wormholes as tools for interstellar travel Applications of wormholes in cosmology have also been investigated [9, 10]

From Here to Eternity and Back: Are Traversable Wormholes …

Albert Einstein –general relativity ~ 1916 Karl Schwarzschild –first exact solution to field equations ~ 1916 Unique spherically symmetric vacuum solution Ludwig Flamm ~ 1916 White hole solution Historical Perspective Visser, Lorentzian Wormholes

Traversable Lorentzian Wormholes: An Overview

Euclidean wormholes are probably unphysical since the strong equivalence principle, which states that spacetime is everywhere a Lorentzian manifold, seems to hold [Visser, p 67] Morris and Thorne's 1988 paper considered traversable wormholes of the following type: 1 Spherically symmetric, static metric 2 Solutions of the Einstein field

Dynamical wormholes in Einstein-Gauss-Bonnet gravity

nation of the Lovelock terms will add to Einstein–Hilbert action [64,65] More recently, higher curvature gravity has been of interest in holography [66,67] and has been consid-ered in the context of cosmology [68,69] Bhawal and Kar studied N-dimensional Lorentzian wormholes in Einstein–Gauss–Bonnetgravity[70]Thesesolutionswithnormaland

Contents

Einstein-Rosen coordinate u is a bad coordinate at the horizon Attempting to cross the horizon, say from u = + to u = − , will force one off the u coordinate patch and into the curvature singularity So stay away from Einstein-Rosen bridges 3 Traversable Wormholes From the last section, we saw that nothing can go through the Einstein

VACUUM DECAY VIA LORENTZIAN WORMHOLES

2 Lorentzian wormholes Wormholes are handles in the spacetime topology linking widely separated regions of the Universe, or bridges joining two di erent spacetimes Thus, a Lorentzian wormhole consists on the union of two copies of identical asymptotically flat four dimensional regions Ω 1 and Ω 2 representing those regions Technically

Dynamical Wormholes in HigherDimensions and theEmergent ...

The Lorentzian wormholes are handles in the spacetime topologies linking widely separated regions of the universeIt was demonstrated that weak energy condition is violated at the throat of the wormholes Visser [6–9] elegantly constructed traversable wormhole based on surgical modified solution of the Einstein's field equations

Lorentzian wormholes generalize thermodynamics still further

Lorentzian wormholes generalize thermodynamics still further To cite this article: Prado Martín-Moruno and Pedro F González-Díaz 2009 Class Quantum Grav 26 215010 View the article online for updates and enhancements Related content Thermal radiation from lorentzian traversable wormholes Prado Martín-Moruno and Pedro F González-Díaz-

Towards realistic Lorentzian wormholes Sayan Kar

• Problem with wormholes in GR: A Lorentzian wormhole geometry acts like a defocusing lens for null geodesic congru-ences flowing from one flat asymptotic re-gion to another across the throat Hence, for wormhole existence, the con-vergence condition Rijuiuj≥ 0 must be vi-olated Since Gij= κTijin GR, the required matter,

Gravitational lensing by wormholes supported by ...

Abstract Wormholes are one of the most interesting topological features in spacetime, offering a rat run between two vastly separated regions of the universe In this paper, we study the deflection angle of light by wormholes, which are supported by electric charge, magnetic charge, and scalar fields in the weak field limit approximation

Revisiting a family of wormholes: geometry, matter, scalar ...

of static wormholes in GR need exotic matter for stability [40,41,85] This is a major drawback for wormholes and, as stated before, forbids their existence within the tenets of GR Let us first write down the energy momentum tensor for a general r() using the Einstein equations and the Einstein tensorTheenergy