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

Why should some essential properties of geometry (i.e., infinity, symmetry, and dimensionality) be both necessary and desirable in the way that they have been constructed—albeit with different modifications over time—since time immemorial? Contrary to the conventional wisdom in all history hitherto existing, the essential properties of geometry do not have to be both necessary and desirable. This is not to suggest, of course, that one has nothing to learn from geometry. On the contrary, geometry has contributed to the advancement of knowledge in many ways since its inception as a field of knowledge some millennia ago. The point in this book, however, is to show an alternative (better) way to understand the nature of geometry, which goes beyond human conception, intuition, and imagination, together with worldly experience of course, as its foundation, while learning from them all—with theoretical implications for time travel, hyperspace, and other important issues. If true, this seminal view will fundamentally change the way that the nature of abstraction in the thinking process is to be understood, with its enormous implications for the future advancement of knowledge, in a small sense, and what I originally called its “post-human” fate, in a large one.

Presents a detailed analysis of modified theories of gravity, discussing their development, cosmological and astrophysical implications and outstanding challenges.

Based on lectures given in honour of Stephen Hawking's sixtieth birthday, this book comprises contributions from some of the world's leading theoretical physicists. It begins with a section containing chapters by successful scientific popularisers, bringing to life both Hawking's work and other exciting developments in physics. The book then goes on to provide a critical evaluation of advanced subjects in modern cosmology and theoretical physics. Topics covered include the origin of the universe, warped spacetime, cosmological singularities, quantum gravity, black holes, string theory, quantum cosmology and inflation. As well as providing a fascinating overview of the wide variety of subject areas to which Stephen Hawking has contributed, this book represents an important assessment of prospects for the future of fundamental physics and cosmology.

Why should urban planning in our time be obsessed with the issue of sustainability? Or differently put, is sustainability really as desirable and possible as its proponents in urban planning (and other related fields like economics, political science, environmental studies, architecture, and so on) would like us to believe? Contrary to the conventional wisdom held by many since the modern era, the concern with sustainability has been much exaggerated and distorted, to the point that it is fast becoming a new intellectual fad, so that its dark sides have been unwarrantedly ignored or downgraded. This is not to say, however, that the literature on sustainability in urban planning (and other related fields) hitherto existing in history has been full of nonsense. Indeed, on the contrary, much can be learned from different theoretical approaches in the literature. The important point to remember here, however, is that this book provides an alternative (better) way to understand the nature of sustainability in urban planning (and other related fields), which learns from different sides of the debate but in the end transcends them all. The urgency of this inquiry should not be underestimated, as it concerns not only urban planning (as a case study here) but also other highly related yet very serious challenges in our time (e.g., ecological, economic, demographic, technological, moral, spiritual, political, and the like). Therefore, if true, this seminal view will fundamentally change the way that we think about the issue of sustainability, with its enormous implications not only for understanding the future of urban planning, in a small sense—but also for predicting the relevance of sustainability in relation to the entire domain of human knowledge for the human future and what I originally called its “post-human” fate, in a broad sense.

The Godel spacetime is an important cosmological solution of Einstein's field equations of gravitation. Although it does not offer a viable description of the physical universe, it illustrates the theoretical possibility of time travel. This work investigates world models similar to the Godel spacetime with particular emphasis on relations between kinematical properties (shear, vorticity, acceleration, expansion) and causality violation, i.e., the formation of closed timelike curves.

This is the first comprehensive book on the philosophy of time. Leading philosophers discuss the metaphysics of time, our experience and representation of time, the role of time in ethics and action, and philosophical issues in the sciences of time, especially quantum mechanics and relativity theory.

The General Theory of Relativity: A Mathematical Exposition will serve readers as a modern mathematical introduction to the general theory of relativity. Throughout the book, examples, worked-out problems, and exercises (with hints and solutions) are furnished. Topics in this book include, but are not limited to: tensor analysis the special theory of relativity the general theory of relativity and Einstein’s field equations spherically symmetric solutions and experimental confirmations static and stationary space-time domains black holes cosmological models algebraic classifications and the Newman-Penrose equations the coupled Einstein-Maxwell-Klein-Gordon equations appendices covering mathematical supplements and special topics Mathematical rigor, yet very clear presentation of the topics make this book a unique text for both university students and research scholars. Anadijiban Das has taught courses on Relativity Theory at The University College of Dublin, Ireland, Jadavpur University, India, Carnegie-Mellon University, USA, and Simon Fraser University, Canada. His major areas of research include, among diverse topics, the mathematical aspects of general relativity theory. Andrew DeBenedictis has taught courses in Theoretical Physics at Simon Fraser University, Canada, and is also a member of The Pacific Institute for the Mathematical Sciences. His research interests include quantum gravity, classical gravity, and semi-classical gravity.

Top researchers in the field of gravitation present the state-of-the-art topics outlined in this book, ranging from the stability of rotating wormholes solutions supported by ghost scalar fields, modified gravity applied to wormholes, the study of novel semi-classical and nonlinear energy conditions, to the applications of quantum effects and the superluminal version of the warp drive in modified spacetime. Based on Einstein's field equations, this cutting-edge research area explores the more far-fetched theoretical outcomes of General Relativity and relates them to quantum field theory. This includes quantum energy inequalities, flux energy conditions, and wormhole curvature, and sheds light on not just the theoretical physics but also on the possible applications to warp drives and time travel. This book extensively explores the physical properties and characteristics of these 'exotic spacetimes,' describing in detail the general relativistic geometries that generate closed timelike curves.

QFEXT is the leading international conference held every two years, highlighting progress in quantum vacuum energy phenomena, the Casimir effect, and related topics, both experimentally and theoretically. This proceedings volume, featuring contributions from many of the

key players in the field, serves as a definitive source of information on this field, which is playing an increasingly important role in nanotechnology and in understanding fundamental issues in physics such as renormalization and in the search for new physics such as fifth forces and dark energy.

A wormhole is a tube-like distortion of time and space connecting distant places in the universe. Wormholes have been featured in many movies, but can they really exist? Wormholes are a prediction of scientific theories, and the precision of mathematics allows them to be described, even before they have ever been seen. Untangling complex physics theories with accessible language and captivating imagery, this book explores the development and evaluation of scientific theories behind wormholes. Supporting the Next Generation Science Standards' emphasis on scientific collection and analysis of data and evidence-based theories, this book will help students grasp the importance of mathematical models of reality, laying the groundwork for a deeper understanding of the nature of science.

The Sixth International Symposium "Frontiers of Fundamental and Computational Physics", Udine, Italy, 26-29 September 2004, aimed at providing a platform for a wide range of physicists to meet and share thoughts on the latest trends in various, mainly cross-disciplinary research areas. This includes the exploration of frontier lines in High Energy Physics, Theoretical Physics, Gravitation and Cosmology, Astrophysics, Condensed Matter Physics, Fluid Mechanics. Such frontier lines were unified by the use of computers as an, often primary, research instruments, or dealing with issues related to information theory. The book contains contributions by Nobel Laureates Leon N. Cooper (1972) and Gerard ‘t Hooft (1999), and concludes with two interesting chapters on new approaches to Physics Teaching. Audience Graduate students, lecturers and researches in Physics

Adopting a proactive approach and focusing on emerging radiation-generating technologies, Health Physics in the 21st Century meets the growing need for a presentation of the relevant radiological characteristics and hazards. As such, this monograph discusses those technologies that will affect the health physics and radiation protection profession over the decades to come. After an introductory overview, the second part of this book looks at fission and fusion energy, followed by a section devoted to accelerators, while the final main section deals with radiation on manned space missions. Throughout, the author summarizes the relevant technology and scientific basis, while providing over 200 problems plus solutions to illustrate and amplify the text. Twelve appendices add further background material to support and enrich the topics addressed in the text, making this invaluable reading for students and lecturers in physics, biophysicists, clinical, nuclear and radiation physicists, as well as physicists in industry.

An accessible introduction to modern physics that focuses on wormholes and discusses among other topics their structure, stability, dynamics, operation as time machines, utility as portals to parallel universes, and their implications for the distant future of humanity. Read the wormhole FAQ and the bullet point "principles" scattered throughout to quickly absorb the basics of wormhole physics. Go back and read the interstitial material for greater depth. Written by a physicist with years of experience in gently introducing physics to the mathematically challenged, it also covers the history of wormhole physics and delineates the unsolved problems at the forefront of research.

Progress of thermodynamics has been stimulated by the findings of a variety of fields of science and technology. The principles of thermodynamics are so general that the application is widespread to such fields as solid state physics, chemistry, biology, astronomical science, materials science, and chemical engineering. The contents of this book should be of help to many scientists and engineers.

The Marcel Grossmann Meetings seek to further the development of the foundations and applications of Einstein's general relativity by promoting theoretical understanding in the relevant fields of physics, mathematics, astronomy and astrophysics and to direct future technological, observational, and experimental efforts. The meetings discuss recent developments in classical and quantum aspects of gravity, and in cosmology and relativistic astrophysics, with major emphasis on mathematical foundations and physical predictions, having the main objective of gathering scientists from diverse backgrounds for deepening our understanding of spacetime structure and reviewing the current state of the art in the theory, observations and experiments pertinent to relativistic gravitation. The range of topics is broad, going from the more abstract classical theory, quantum gravity, branes and strings, to more concrete relativistic astrophysics observations and modeling. The three volumes of the proceedings of MG13 give a broad view of all aspects of gravitational physics and astrophysics, from mathematical issues to recent observations and experiments. The scientific program of the meeting included 33 morning plenary talks during 6 days, and 75 parallel sessions over 4 afternoons. Volume A contains plenary and review talks ranging from the mathematical foundations of classical and quantum gravitational theories including recent developments in string/brane theories, to precision tests of general relativity including progress towards the detection of gravitational waves, and from supernova cosmology to relativistic astrophysics including such topics as gamma ray bursts, black hole physics both in our galaxy and in active galactic nuclei in other galaxies, and neutron star and pulsar astrophysics. Volumes B and C include parallel sessions which touch on dark matter, neutrinos, X-ray sources, astrophysical black holes, neutron stars, binary systems, radiative transfer, accretion disks, quasors, gamma ray bursts, supernovas, alternative gravitational theories, perturbations of collapsed objects, analog models, black hole thermodynamics, numerical relativity, gravitational lensing, large scale structure, observational cosmology, early universe models and cosmic microwave background anisotropies, inhomogeneous cosmology, inflation, global structure, singularities, chaos, Einstein–Maxwell systems, wormholes, exact solutions of Einstein's equations, gravitational waves, gravitational wave detectors and data analysis, precision gravitational measurements, quantum gravity and loop quantum gravity, quantum cosmology, strings and branes, self-gravitating systems, gamma ray astronomy, and cosmic rays and the history of general relativity. Contents:On the Cosmological Singularity (Vladimir A Belinski)GRB Afterglow Discovery with Bepposax: Its Story 15 Years Later (Filippo Frontera)Rotation, Convection, and Core Collapse (W David Arnett)Spacetime Singularities: Recent Developments (Claes Uggla)Hidden Symmetries: From BKL to Kac–Moody (Philipp Fleig & Hermann Nicolai)Recent Results in Mathematical GR (Sergiu Klainerman)Higher Dimensional Black Holes (Harvey S Reall)Causal Dynamical Triangulations and the Search for a Theory of Quantum Gravity (Jan Ambjorn, Andrzej Görlich, Jerzy Jurkiewicz & Renate Loll)On Quantum Gravity, Asymptotic Safety, and Paramagnetic Dominance (Andreas Nink & Martin Reuter)Perturbative Quantum Gravity as a Double Copy of Gauge Theory and Implications for UV Properties (Zvi Bern)Type Ia Supernova Cosmology: Past and Future (Ariel Goobar)The Energetic Universe: A Nobel Surprise (Robert P Kirshner)Strong, Weak, Electromagnetic and Gravitational Interactions in Neutron Stars (Jorge Rueda & Remo Ruffini)Gravitational-Wave Physics and Astronomy Using Ground-Based Interferometers (David H Reitze & David H Shoemaker)Gamma-Ray Burst Prompt Emission (Bing Zhang)Black Holes, Supernovae and Gamma Ray Bursts (Remo Ruffini)Precisions Tests of Theories of Gravity Using Pulsars (Michael Kramer)The Planck Mission: Recent Results, Cosmological and Fundamental Physics Perspectives (Nazzareno Mandolesi, Carlo Burigana, Alessandro Gruppuso & Paolo Natoli)Observation of a New Boson at a Mass of 125 GeV with the CMS Experiment at the LHC (Chiara Mariotti)Unavoidable CMB Spectral Features and Blackbody Photosphere of Our Universe (Rashid Sunyaev & Rishi Khatri)Search for the Standard Model Higgs Boson with the ATLAS Detector (Domizia Orestano) Readership: Graduate students in astronomy, astrophysics and cosmology, and scientists interested in general relativity, gravitation, astrophysics, quantum gravity, particle physics, cosmology and theoretical physics. Keywords:General Relativity;Gravitation;Astrophysics;Quantum Gravity;Particle Physics;Cosmology;Theoretical Physics

About the possibility of time traveling based on several specialized works, including those of Nicholas J. J. Smith ("Time Travel"), William Grey (”Troubles with Time Travel”), Ulrich Meyer (”Explaining causal loops”), Simon Keller and Michael Nelson (”Presentists should believe in time-travel”), Frank Arntzenius and Tim Maudlin ("Time Travel and Modern Physics"), and David Lewis (“The Paradoxes of Time Travel”). The article begins with an Introduction in which I make a short presentation of the time travel, and continues with a History of the concept of time travel, main physical aspects of time travel, including backward time travel in the past in general relativity and quantum physics, and time

travel in the future, then a presentation of the Grandfather paradox that is approached in almost all specialized works, followed by a section dedicated to the Philosophy of time travel, and a section in which I analyze Causal loops for time travel. I finish my work with Conclusions, in which I sustain my personal opinions on the time travel, and the Bibliography on which the work is based. Keywords: time travel, grandfather paradox, causal loops, temporal paradoxes, causality CONTENTS Abstract Introduction History of the concept of time travel Grandfather paradox The philosophy of time travel Causal loops Conclusions Bibliography Notes DOI: 10.13140/RG.2.2.17802.31680

Collection of articles examining some of the latest work in the understanding of physics.

This volume gives a unified picture of the multifaceted subject of superradiance, with a focus on recent developments in the field, ranging from fundamental physics to astrophysics. Superradiance is a radiation enhancement process that involves dissipative systems. With a 60 year-old history, superradiance has played a prominent role in optics, quantum mechanics and especially in relativity and astrophysics. In Einstein's General Relativity, black-hole superradiance is permitted by dissipation at the event horizon, which allows energy extraction from the vacuum, even at the classical level. When confined, this amplified radiation can give rise to strong instabilities known as "blackhole bombs", which have applications in searches for dark matter, in physics beyond the Standard Model and in analog models of gravity. This book discusses and draws together all these fascinating aspects of superradiance.

Since 1975, the Marcel Grossmann Meetings have been organized to provide opportunities for discussing recent advances in gravitation, general relativity and relativistic field theories, emphasizing mathematical foundations, physical predictions and experimental tests. The objective of these meetings is to facilitate exchange among scientists that may deepen our understanding of space-time structures and to review the status of ongoing experiments aimed at testing Einstein's theory of gravitation from either the ground or space.The Eighth Marcel Grossmann Meeting took place on 22-27 June, 1997, at the Hebrew University of Jerusalem, Israel. The scientific program included 25 plenary talks and 40 parallel sessions during which 400 papers were presented. The papers that appear in this book cover all aspects of gravitation, from mathematical issues to recent observations and experiments.

Drawing on pivotal work by Einstein, Wheeler, Thorne, Hawking, and others, Matt Visser charts the development and current state of Lorentzian wormhole physics. Dr. Visser shows that by pushing established physical theories to their limits, it is possible to deduce the true physics of such exotica as wormholes and time travel. The physical framework he uses is derived from one of the major research frontiers of modern theoretical physics: quantum gravity the intersection of classical Einstein gravity and quantum field theory. About the Author Matt Visser is Research Assistant Professor at Washington University, St. Louis. He has lectured in the United States and abroad on topics including wormhole physics, time travel, and the chronology protection conjecture. He has conducted postdoctoral research at both the University of Southern California and at Los Alamos National Laboratory.

Discusses what people understand about space and time and how science fiction is becoming less fictional as time goes on.

Discusses the general theory of relativity, Lie derivatives, rotating black holes, with a focus on basics of cosmology and astrophysics.

This book explores intersections of science and religion, spirituality and technology, engineering and science fiction, mind and matter, and outlines a new cosmic, transhumanist religion. Hacking religion, enlightening science, awakening technology.

Recent developments in the field of timing and time perception have not simply multiplied the number of relevant questions regarding psychological time, but they have also helped to provide more answers and open many fascinating avenues of thought. "Psychology of Time" brings together cutting-edge presentations of many of the main ideas, findings, hypotheses and theories that experimental psychology provides to the field of timing and psychological time.The contributors, selected for their ability to address various specific questions, were asked to discuss what is known in their field and what avenues remain to be explored. As a result, this book should point readers in the right direction and guide them to reflect on the various and most fundamental issues on psychological time. It offers a balanced integration of old and sometimes neglected findings and more recent empirical advances, all presented within the scope of the critical sub-fields of psychological time in experimental psychology.

Thanks to Einstein's relativity theories, our notions of space and time underwent profound revisions about a 100 years ago. The resulting interplay between geometry and physics has dominated all of fundamental physics since then. This volume contains contributions from leading researchers, worldwide, who have thought deeply about the nature and consequences of this interplay. The articles take a long-range view of the subject and distill the most important advances in broad terms, making them easily accessible to non-specialists. The first part is devoted to a summary of how relativity theories were born (J Stachel). The second part discusses the most dramatic ramifications of general relativity, such as black holes (P Chrusciel and R Price), space-time singularities (H Nicolai and A Rendall), gravitational waves (P Laguna and P Saulson), the large scale structure of the cosmos (T Padmanabhan); experimental status of this theory (C Will) as well as its practical application to the GPS system (N Ashby). The last part looks beyond Einstein and provides glimpses into what is in store for us in the 21st century. Contributions here include summaries of radical changes in the notions of space and time that are emerging from quantum field theory in curved space-times (Ford), string theory (T Banks), loop quantum gravity (A Ashtekar), quantum cosmology (M Bojowald), discrete approaches (Dowker, Gambini and Pullin) and twistor theory (R Penrose).

Do you know the basics of general relativity? Do you want to know something of what more there is? Do you wonder how the theory of relativity came into being? Then this book is for you! Partial contents: - Black holes and gravitational collapse - Cosmological solutions of Einstein's field equations - Gravitational waves - Space-time singularities - The problem of motion for massive particles - A collection of exact solutions of Einstein's field equations - A history of Einstein's creation of the theory of relativity in the years 1905-1915 - A short course for repetition of the basics of general relativity - Bibliography, references, and index The book, although not very advanced, covers a number of topics not often seen in text books. The selection, of course, refelects my own interests. The different chapters may to a large extent, though not completely, be read in any desired order. The author has a PhD in theoretical physics and is lecturer of mathematics. He has for many years taught physics and mathematics at senior high school as well as university level.

This article is dedicated to Claudio Bunster on the occasion of his 60th birthday. It is a great honor to take this opportunity to express my gratitude to him, who in my opinion has been the greatest national physicist ever, for his wise guidance and intrepid support through the years. As a Chilean, I can further tell that Claudio’s contributions have been well far beyond theoretical physics, helping our country to be ready to face future challenges through science. Gravity in diverse dimensions is a subject in which Claudio has done major c- tributions, encouraging in many ways the following work, that is being made along different fronts in collaboration with my colleagues Diego Correa, Gustavo Dotti, Julio Oliva and David Tempo. Thepursuitforwormholesolutions,whicharehandlesinthespacetimetopology, it is as old as General Relativity and it has appeared in theoretical physics within different subjects, ranging from the attempt of describing physics as pure geometry, as in the Einstein–Rosen bridge model of a particle [1], to the concept of “charge withoutcharge”[2],aswell asindifferentissuesconcerningthe Euclideanapproach to quantum gravity (see, e.g., [3]). More recently, the systematic study of this kind of objects was pushed forward by the works of Morris, Thorne and Yurtsever [4,5].

Manifolds fall naturally into two classes depending on whether they can be fitted with a distance measuring function or not. The former, metrisable manifolds, and especially compact manifolds, have been intensively studied by topologists for over a century, whereas the latter, non-metrisable manifolds, are much more abundant but have a more modest history, having become of increasing interest only over the past 40 years or so. The first book on this topic, this book ranges from criteria for metrisability, dynamics on non-metrisable manifolds, Nyikos’s Bagpipe Theorem and whether perfectly normal manifolds are metrisable to structures on manifolds, especially the abundance of exotic

differential structures and the dearth of foliations on the long plane. A rigid foliation of the Euclidean plane is described. This book is intended for graduate students and mathematicians who are curious about manifolds beyond the metrisability wall, and especially the use of Set Theory as a tool.

Relativity theory has become one of the icons of Twentieth Century science. It's reckoned to be a difficult subject, taught as a layered series of increasingly difficult mathematics and increasingly abstract concepts. We're told that relativity theory is supposed to be this complicated and counter-intuitive. But how much of this historical complexity is really necessary? Can we bypass the interpretations and paradoxes and pseudoparadoxes of Einstein's special theory and jump directly to a deeper and more intuitive description of reality? What if curvature is a fundamental part of physics, and a final theory of relativity shouldn't reduce to Einstein's "flat" 1905 theory //on principle//? "Relativity..." takes us on a whistlestop tour of Twentieth Century physics - from black holes, quantum mechanics, wormholes and the Big Bang to the workings of the human mind, and asks: what would physics look like without special relativity? 394 printed pages, 234156 mm, ~200 figures and illustrations, includes bibliography and index www.relativitybook.com

This volume sheds light on still unexplored issues and raises new questions in the main areas addressed by the philosophy of science. Bringing together selected papers from three main events, the book presents the most advanced scientific results in the field and suggests innovative lines for further investigation. It explores how discussions on several notions of the philosophy of science can help different scientific disciplines in learning from each other. Finally, it focuses on the relationship between Cambridge and Vienna in twentieth century philosophy of science. The areas examined in the book are: formal methods, the philosophy of the natural and life sciences, the cultural and social sciences, the physical sciences and the history of the philosophy of science.

Bringing the material up to date, Black Holes, Wormholes and Time Machines, Second Edition captures the new ideas and discoveries made in physics since the publication of the best-selling first edition. While retaining the popular format and style of its predecessor, this edition explores the latest developments in high-energy astroparticle physics and Big Bang cosmology. The book continues to make the ideas and theories of modern physics easily understood by anyone, from researchers to students to general science enthusiasts. Taking you on a journey through space and time, author Jim Al-Khalili covers some of the most fascinating topics in physics today, including: Black holes Space warps The Big Bang Time travel Wormholes Parallel universes Professor Al-Khalili explains often complex scientific concepts in simple, nontechnical terms and imparts an appreciation of the cosmos, helping you see how time traveling may not be so far-fetched after all.

An expansive and conceptually unifying textbook of fundamental and theoretical physics, describing elementary particles and their interactions.

Annotation "Design Methodologies for Space Transportation Systems is a sequel to the author's earlier text, "Space Transportation: A Systems Approach to Analysis and Design. Both texts represent the most comprehensive exposition of the existing knowledge and practice in the design and project management of space transportation systems, and they reflect a wealth of experience by the author with the design and management of space systems. The text discusses new conceptual changes in the design philosophy away from multistage expendable vehicles to winged, reusable launch vehicles and presents an overview of the systems engineering and vehicle design process as well as systems trades and analysis. Individual chapters are devoted to specific disciplines such as aerodynamics, aerothermal analysis, structures, materials, propulsion, flight mechanics and trajectories, avionics and computers, and control systems. The final chapters deal with human factors, payload, launch and mission operations, safety, and mission assurance. The two texts by the author provide a valuable source of information for the space transportation community of designers, operators, and managers. A companion CD-ROM succinctly packages some oversized figures and tables, resources for systems engineering and launch ranges, and a compendium of software programs. The computer programs include the USAF AIRPLANE AND MISSILE DATCOM CODES (with extensive documentation); COSTMODL for software costing; OPGUID launch vehicle trajectory generator; SUPERFLO-a series of 11 programs intended for solving compressible flow problems in ducts and pipes found in industrial facilities; and a wealth of Microsoft Excel spreadsheet programs covering thedisciplines of statistics, vehicle trajectories, propulsion performance, math utilities,

Almost weightless and able to pass through the densest materials with ease, neutrinos may offer answers to questions ranging from relativity and quantum mechanics to more radical theories about dark energy and supersymmetry. Heinrich Päs serves as our fluent guide to a particle world that tests the boundaries of space, time, and human knowledge.

Does ETI existence spell the death of Christianity? The increasingly popular answer is "yes". Marie George argues, to the contrary, that Christian belief is compatible with ETI existence, by examining Roman Catholic teaching and Scripture. She then makes a case that while Christian belief does not exclude ETI existence, it does render it improbable. George goes on to expose the faulty reasoning behind the common opinion that science indicates that the universe surely contains other intelligent life forms. She closes with speculations on what the Catholic Church might eventually say about ETIs. Central to her analysis is the cosmic role of Christ."I appreciate arguments like those in Christianity and Extraterrestrials?, laid out carefully and investigated thoroughly. If more writers proceeded with Dr. George's care and courtesy, there would be new hope for peace in the world."John L. Barger, Ph.D. Publisher, Sophia Institute Press"Although some of Dr. George's claims are controversial, she is clearly an author seeking the truth and open to opposing arguments. Moreover, she has sought out the best sources and used them wisely-in short, an admirable scholarly presentation."Michael J. Crowe Cavanaugh Professor Emeritus, University of Notre Dame and author of The Extraterrestrial Life Debate, 1750-1900

Hypothetical Spacecraft and Interstellar Travel collects information about the latest and greatest hypothetical spacecraft.