

Sean Carroll Spacetime And Geometry Solutions

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KINDLY SAY, THE SEAN CARROLL SPACETIME AND GEOMETRY SOLUTIONS IS UNIVERSALLY COMPATIBLE WITH ANY DEVICES TO READ

MODERN CLASSICAL PHYSICS KIP S. THORNE 2017-09-05 A GROUNDBREAKING TEXT AND REFERENCE BOOK ON TWENTY-FIRST-CENTURY CLASSICAL PHYSICS AND ITS APPLICATIONS THIS FIRST-YEAR GRADUATE-LEVEL TEXT AND REFERENCE BOOK COVERS THE FUNDAMENTAL CONCEPTS AND TWENTY-FIRST-CENTURY APPLICATIONS OF SIX MAJOR AREAS OF CLASSICAL PHYSICS THAT EVERY MASTERS- OR PHD-LEVEL PHYSICIST SHOULD BE EXPOSED TO, BUT OFTEN ISN'T: STATISTICAL PHYSICS, OPTICS (WAVES OF ALL SORTS), ELASTODYNAMICS, FLUID MECHANICS, PLASMA PHYSICS, AND SPECIAL AND GENERAL RELATIVITY AND COSMOLOGY. GROWING OUT OF A FULL-YEAR COURSE THAT THE EMINENT RESEARCHERS KIP THORNE AND ROGER BLANDFORD TAUGHT AT CALTECH FOR ALMOST THREE DECADES, THIS BOOK IS DESIGNED TO BROADEN THE TRAINING OF PHYSICISTS. ITS SIX MAIN TOPICAL SECTIONS ARE ALSO DESIGNED SO THEY CAN BE USED IN SEPARATE COURSES, AND THE BOOK PROVIDES AN INVALUABLE REFERENCE FOR RESEARCHERS. PRESENTS ALL THE MAJOR FIELDS OF CLASSICAL PHYSICS EXCEPT THREE PREREQUISITES: CLASSICAL MECHANICS, ELECTROMAGNETISM, AND ELEMENTARY THERMODYNAMICS ELUCIDATES THE INTERCONNECTIONS BETWEEN DIVERSE FIELDS AND EXPLAINS THEIR SHARED CONCEPTS AND TOOLS FOCUSES ON FUNDAMENTAL CONCEPTS AND MODERN, REAL-WORLD APPLICATIONS TAKES APPLICATIONS FROM FUNDAMENTAL, EXPERIMENTAL, AND APPLIED PHYSICS; ASTROPHYSICS AND COSMOLOGY; GEOPHYSICS, OCEANOGRAPHY, AND METEOROLOGY; BIOPHYSICS AND CHEMICAL PHYSICS; ENGINEERING AND OPTICAL SCIENCE AND TECHNOLOGY; AND INFORMATION SCIENCE AND TECHNOLOGY EMPHASIZES THE QUANTUM ROOTS OF CLASSICAL PHYSICS AND HOW TO USE QUANTUM TECHNIQUES TO ELUCIDATE CLASSICAL CONCEPTS OR SIMPLIFY CLASSICAL CALCULATIONS FEATURES HUNDREDS OF COLOR FIGURES, SOME FIVE HUNDRED EXERCISES, EXTENSIVE CROSS-REFERENCES, AND A DETAILED INDEX AN ONLINE ILLUSTRATION PACKAGE IS AVAILABLE

A GENERAL RELATIVITY WORKBOOK THOMAS A. MOORE 2015-03-06

A MATHEMATICAL INTRODUCTION TO GENERAL RELATIVITY AMOL SASANE 2021-08-10 THE BOOK AIMS TO GIVE A MATHEMATICAL PRESENTATION OF THE THEORY OF GENERAL RELATIVITY (THAT IS, SPACETIME-GEOMETRY-BASED GRAVITATION THEORY) TO ADVANCED UNDERGRADUATE MATHEMATICS STUDENTS. MATHEMATICIANS WILL FIND SPACETIME PHYSICS PRESENTED IN THE DEFINITION-THEOREM-PROOF FORMAT FAMILIAR TO THEM. THE GIVEN PRECISE MATHEMATICAL DEFINITIONS OF PHYSICAL NOTIONS HELP AVOIDING PITFALLS, ESPECIALLY IN THE CONTEXT OF SPACETIME PHYSICS DESCRIBING PHENOMENA THAT ARE COUNTER-INTUITIVE TO EVERYDAY EXPERIENCES. IN THE FIRST PART, THE DIFFERENTIAL GEOMETRY OF SMOOTH MANIFOLDS, WHICH IS NEEDED TO PRESENT THE SPACETIME-BASED GRAVITATION THEORY, IS DEVELOPED FROM SCRATCH. HERE, MANY OF THE ILLUSTRATING EXAMPLES ARE THE LORENTZIAN MANIFOLDS WHICH LATER SERVE AS SPACETIME MODELS. THIS HAS THE TWOFOLD PURPOSE OF MAKING THE PHYSICS FORTHCOMING IN THE SECOND PART RELATABLE, AND THE MATHEMATICS LEARNT IN THE FIRST PART LESS DRY. THE BOOK USES THE MODERN COORDINATE-FREE LANGUAGE OF SEMI-RIEMANNIAN GEOMETRY. NEVERTHELESS, TO FAMILIARISE THE READER WITH THE USEFUL TOOL OF COORDINATES FOR COMPUTATIONS, AND TO BRIDGE THE GAP WITH THE PHYSICS LITERATURE, THE LINK TO COORDINATES IS MADE THROUGH EXERCISES, AND VIA FREQUENT REMARKS ON HOW THE TWO LANGUAGES ARE RELATED. IN THE SECOND PART, THE FOCUS IS ON PHYSICS, COVERING ESSENTIAL MATERIAL OF THE 20TH CENTURY SPACETIME-BASED VIEW OF GRAVITY: ENERGY-MOMENTUM TENSOR FIELD OF MATTER, FIELD EQUATION, SPACETIME EXAMPLES, NEWTONIAN APPROXIMATION, GEODESICS, TESTS OF THE THEORY, BLACK HOLES, AND COSMOLOGICAL MODELS OF THE UNIVERSE. PRIOR KNOWLEDGE OF DIFFERENTIAL GEOMETRY OR PHYSICS IS NOT ASSUMED. THE BOOK IS INTENDED FOR SELF-STUDY, AND THE SOLUTIONS TO THE (OVER

200) EXERCISES ARE INCLUDED.

GENERAL RELATIVITY ROBERT M. WALD 2010-05-15 "WALD'S BOOK IS CLEARLY THE FIRST TEXTBOOK ON GENERAL RELATIVITY WITH A TOTALLY MODERN POINT OF VIEW; AND IT SUCCEEDS VERY WELL WHERE OTHERS ARE ONLY PARTIALLY SUCCESSFUL. THE BOOK INCLUDES FULL DISCUSSIONS OF MANY PROBLEMS OF CURRENT INTEREST WHICH ARE NOT TREATED IN ANY EXTANT BOOK, AND ALL THESE MATTERS ARE CONSIDERED WITH PERCEPTION AND UNDERSTANDING."—S. CHANDRASEKHAR "A TOUR DE FORCE: LUCID, STRAIGHTFORWARD, MATHEMATICALLY RIGOROUS, EXACTING IN THE ANALYSIS OF THE THEORY IN ITS PHYSICAL ASPECT."—L. P. HUGHSTON, TIMES HIGHER EDUCATION SUPPLEMENT "TRULY EXCELLENT. . . A SOPHISTICATED TEXT OF MANAGEABLE SIZE THAT WILL PROBABLY BE READ BY EVERY STUDENT OF RELATIVITY, ASTROPHYSICS, AND FIELD THEORY FOR YEARS TO COME."—JAMES W. YORK, PHYSICS TODAY

THE ROAD TO REALITY ROGER PENROSE 2021-06-09 **WINNER OF THE 2020 NOBEL PRIZE IN PHYSICS** THE ROAD TO REALITY IS THE MOST IMPORTANT AND AMBITIOUS WORK OF SCIENCE FOR A GENERATION. IT PROVIDES NOTHING LESS THAN A COMPREHENSIVE ACCOUNT OF THE PHYSICAL UNIVERSE AND THE ESSENTIALS OF ITS UNDERLYING MATHEMATICAL THEORY. IT ASSUMES NO PARTICULAR SPECIALIST KNOWLEDGE ON THE PART OF THE READER, SO THAT, FOR EXAMPLE, THE EARLY CHAPTERS GIVE US THE VITAL MATHEMATICAL BACKGROUND TO THE PHYSICAL THEORIES EXPLORED LATER IN THE BOOK. ROGER PENROSE'S PURPOSE IS TO DESCRIBE AS CLEARLY AS POSSIBLE OUR PRESENT UNDERSTANDING OF THE UNIVERSE AND TO CONVEY A FEELING FOR ITS DEEP BEAUTY AND PHILOSOPHICAL IMPLICATIONS, AS WELL AS ITS INTRICATE LOGICAL INTERCONNECTIONS. THE ROAD TO REALITY IS RARELY LESS THAN CHALLENGING, BUT THE BOOK IS LEAVENED BY VIVID DESCRIPTIVE PASSAGES, AS WELL AS HUNDREDS OF HAND-DRAWN DIAGRAMS. IN A SINGLE WORK OF COLOSSAL SCOPE ONE OF THE WORLD'S GREATEST SCIENTISTS HAS GIVEN US A COMPLETE AND UNRIVALLED GUIDE TO THE GLORIES OF THE UNIVERSE THAT WE ALL INHABIT. 'ROGER PENROSE IS THE MOST IMPORTANT PHYSICIST TO WORK IN RELATIVITY THEORY EXCEPT FOR EINSTEIN. HE IS ONE OF THE VERY FEW PEOPLE I'VE MET IN MY LIFE WHO, WITHOUT RESERVATION, I CALL A GENIUS' LEE SMOLIN

A FIRST COURSE IN GENERAL RELATIVITY BERNARD SCHUTZ 2009-05-14 SECOND EDITION OF A WIDELY-USED TEXTBOOK PROVIDING THE FIRST STEP INTO GENERAL RELATIVITY FOR UNDERGRADUATE STUDENTS WITH MINIMAL MATHEMATICAL BACKGROUND.

EINSTEIN GRAVITY IN A NUTSHELL A. ZEE 2013-05-05 AN IDEAL INTRODUCTION TO EINSTEIN'S GENERAL THEORY OF RELATIVITY THIS UNIQUE TEXTBOOK PROVIDES AN ACCESSIBLE INTRODUCTION TO EINSTEIN'S GENERAL THEORY OF RELATIVITY, A SUBJECT OF BREATHTAKING BEAUTY AND SUPREME IMPORTANCE IN PHYSICS. WITH HIS TRADEMARK BLEND OF WIT AND INCISIVENESS, A. ZEE GUIDES READERS FROM THE FUNDAMENTALS OF NEWTONIAN MECHANICS TO THE MOST EXCITING FRONTIERS OF RESEARCH TODAY, INCLUDING DE SITTER AND ANTI-DE SITTER SPACETIMES, KALUZA-KLEIN THEORY, AND BRANE WORLDS. UNLIKE OTHER BOOKS ON EINSTEIN GRAVITY, THIS BOOK EMPHASIZES THE ACTION PRINCIPLE AND GROUP THEORY AS GUIDES IN CONSTRUCTING PHYSICAL THEORIES. ZEE TREATS VARIOUS TOPICS IN A SPIRAL STYLE THAT IS EASY ON BEGINNERS, AND INCLUDES ANECDOTES FROM THE HISTORY OF PHYSICS THAT WILL APPEAL TO STUDENTS AND EXPERTS ALIKE. HE TAKES A FRIENDLY APPROACH TO THE REQUIRED MATHEMATICS, YET DOES NOT SHY AWAY FROM MORE ADVANCED MATHEMATICAL TOPICS SUCH AS DIFFERENTIAL FORMS. THE EXTENSIVE DISCUSSION OF BLACK HOLES INCLUDES ROTATING AND EXTREMAL BLACK HOLES AND HAWKING RADIATION. THE IDEAL TEXTBOOK FOR UNDERGRADUATE AND GRADUATE STUDENTS, EINSTEIN GRAVITY IN A NUTSHELL ALSO PROVIDES AN ESSENTIAL RESOURCE FOR PROFESSIONAL PHYSICISTS AND IS ACCESSIBLE TO ANYONE FAMILIAR WITH CLASSICAL MECHANICS AND ELECTROMAGNETISM. IT FEATURES NUMEROUS EXERCISES AS WELL AS DETAILED APPENDICES COVERING A MULTITUDE OF TOPICS NOT READILY FOUND ELSEWHERE. PROVIDES AN ACCESSIBLE INTRODUCTION TO EINSTEIN'S GENERAL THEORY OF RELATIVITY GUIDES READERS FROM NEWTONIAN MECHANICS TO THE FRONTIERS OF MODERN RESEARCH EMPHASIZES SYMMETRY AND THE EINSTEIN-HILBERT ACTION COVERS TOPICS NOT FOUND IN STANDARD TEXTBOOKS ON EINSTEIN GRAVITY INCLUDES INTERESTING HISTORICAL ASIDES FEATURES NUMEROUS EXERCISES AND DETAILED APPENDICES IDEAL FOR STUDENTS, PHYSICISTS, AND SCIENTIFICALLY MINDED LAY READERS SOLUTIONS MANUAL (AVAILABLE ONLY TO TEACHERS)

SPACETIME PHYSICS EDWIN F. TAYLOR 1992-03-15 COLLABORATION ON THE FIRST EDITION OF SPACETIME PHYSICS BEGAN IN THE MID-1960S WHEN EDWIN TAYLOR TOOK A JUNIOR FACULTY SABBATICAL AT PRINCETON UNIVERSITY WHERE JOHN WHEELER WAS A PROFESSOR. THE RESULTING TEXT EMPHASIZED THE UNITY OF SPACETIME AND THOSE QUANTITIES (SUCH AS PROPER TIME, PROPER DISTANCE, MASS) THAT ARE INVARIANT, THE SAME FOR ALL OBSERVERS, RATHER THAN THOSE QUANTITIES (SUCH AS SPACE AND TIME SEPARATIONS) THAT ARE RELATIVE, DIFFERENT FOR DIFFERENT OBSERVERS. THE BOOK HAS BECOME A STANDARD INTRODUCTION TO RELATIVITY. THE SECOND EDITION OF SPACETIME PHYSICS EMBODIES WHAT THE AUTHORS HAVE LEARNED DURING AN ADDITIONAL QUARTER CENTURY OF TEACHING AND RESEARCH. THEY HAVE UPDATED THE TEXT TO REFLECT THE IMMENSE STRIDES IN PHYSICS DURING THE SAME PERIOD AND MODERNIZED AND INCREASED THE NUMBER OF EXERCISES, FOR WHICH THE FIRST EDITION WAS FAMOUS. ENRICHMENT BOXES PROVIDE EXPANDED COVERAGE OF INTRIGUING TOPICS. AN ENLARGED FINAL CHAPTER ON GENERAL

RELATIVITY INCLUDES NEW MATERIAL ON GRAVITY WAVES, BLACK HOLES, AND COSMOLOGY. THE SECOND EDITION OF SPACETIME PHYSICS PROVIDES A NEW GENERATION OF READERS WITH A DEEP AND SIMPLE OVERVIEW OF THE PRINCIPLES OF RELATIVITY.

THE BIG PICTURE SEAN CARROLL 2016-05-10 THE INSTANT NEW YORK TIMES BESTSELLER ABOUT HUMANITY'S PLACE IN THE UNIVERSE—AND HOW WE UNDERSTAND IT. “VIVID...IMPRESSIVE...SPLENDIDLY INFORMATIVE.”—THE NEW YORK TIMES “SUCCEEDS SPECTACULARLY.”—SCIENCE “A TOUR DE FORCE.”—SALON ALREADY INTERNATIONALLY ACCLAIMED FOR HIS ELEGANT, LUCID WRITING ON THE MOST CHALLENGING NOTIONS IN MODERN PHYSICS, SEAN CARROLL IS EMERGING AS ONE OF THE GREATEST HUMANIST THINKERS OF HIS GENERATION AS HE BRINGS HIS EXTRAORDINARY INTELLECT TO BEAR NOT ONLY ON HIGGS BOSONS AND EXTRA DIMENSIONS BUT NOW ALSO ON OUR DEEPEST PERSONAL QUESTIONS: WHERE ARE WE? WHO ARE WE? ARE OUR EMOTIONS, OUR BELIEFS, AND OUR HOPES AND DREAMS ULTIMATELY MEANINGLESS OUT THERE IN THE VOID? DO HUMAN PURPOSE AND MEANING FIT INTO A SCIENTIFIC WORLDVIEW? IN SHORT CHAPTERS FILLED WITH INTRIGUING HISTORICAL ANECDOTES, PERSONAL ASIDES, AND RIGOROUS EXPOSITION, READERS LEARN THE DIFFERENCE BETWEEN HOW THE WORLD WORKS AT THE QUANTUM LEVEL, THE COSMIC LEVEL, AND THE HUMAN LEVEL—AND THEN HOW EACH CONNECTS TO THE OTHER. CARROLL'S PRESENTATION OF THE PRINCIPLES THAT HAVE GUIDED THE SCIENTIFIC REVOLUTION FROM DARWIN AND EINSTEIN TO THE ORIGINS OF LIFE, CONSCIOUSNESS, AND THE UNIVERSE IS DAZZLINGLY UNIQUE. CARROLL SHOWS HOW AN AVALANCHE OF DISCOVERIES IN THE PAST FEW HUNDRED YEARS HAS CHANGED OUR WORLD AND WHAT REALLY MATTERS TO US. OUR LIVES ARE DWARFED LIKE NEVER BEFORE BY THE IMMENSITY OF SPACE AND TIME, BUT THEY ARE REDEEMED BY OUR CAPACITY TO COMPREHEND IT AND GIVE IT MEANING. *THE BIG PICTURE* IS AN UNPRECEDENTED SCIENTIFIC WORLDVIEW, A TOUR DE FORCE THAT WILL SIT ON SHELVES ALONGSIDE THE WORKS OF STEPHEN HAWKING, CARL SAGAN, DANIEL DENNETT, AND E. O. WILSON FOR YEARS TO COME.

GRAVITATION CHARLES W. MISNER 2017-10-24 SPACETIME PHYSICS -- PHYSICS IN FLAT SPACETIME -- THE MATHEMATICS OF CURVED SPACETIME -- EINSTEIN'S GEOMETRIC THEORY OF GRAVITY -- RELATIVISTIC STARS -- THE UNIVERSE -- GRAVITATIONAL COLLAPSE AND BLACK HOLES -- GRAVITATIONAL WAVES -- EXPERIMENTAL TESTS OF GENERAL RELATIVITY -- FRONTIERS

INTRODUCTION TO COSMOLOGY BARBARA RYDEN 2017 A SUBSTANTIAL UPDATE OF THIS AWARD-WINNING AND HIGHLY REGARDED COSMOLOGY TEXTBOOK, FOR ADVANCED UNDERGRADUATES IN PHYSICS AND ASTRONOMY.

EXACT SPACE-TIMES IN EINSTEIN'S GENERAL RELATIVITY JERRY B. GRIFFITHS 2009-10-15 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.

GENERAL RELATIVITY MICHAEL PAUL HOBSON 2006 WRITTEN FOR ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS, THIS IS A CLEAR MATHEMATICAL INTRODUCTION TO EINSTEIN'S THEORY OF GENERAL RELATIVITY AND ITS PHYSICAL APPLICATIONS. CONCENTRATING ON THE THEORY'S PHYSICAL CONSEQUENCES, THIS APPROACHABLE TEXTBOOK CONTAINS OVER 300 EXERCISES TO ILLUMINATE AND EXTEND THE DISCUSSION.

GAUGE/GRAVITY DUALITY MARTIN AMMON 2015-04-09 THE FIRST TEXTBOOK ON THIS IMPORTANT TOPIC, FOR GRADUATE STUDENTS AND RESEARCHERS IN PARTICLE AND CONDENSED MATTER PHYSICS.

A STUDENT'S GUIDE TO GENERAL RELATIVITY NORMAN GRAY 2019-01-03 VECTORS, TENSORS AND FUNCTIONS -- MANIFOLDS, VECTORS AND DIFFERENTIATION -- ENERGY, MOMENTUM AND EINSTEIN'S EQUATIONS

PROBLEM BOOK IN RELATIVITY AND GRAVITATION ALAN P. LIGHTMAN 2017-09-29 AN ESSENTIAL RESOURCE FOR LEARNING ABOUT GENERAL RELATIVITY AND MUCH MORE, FROM FOUR LEADING EXPERTS IMPORTANT AND USEFUL TO EVERY STUDENT OF RELATIVITY, THIS BOOK IS A UNIQUE COLLECTION OF SOME 475 PROBLEMS--WITH SOLUTIONS--IN THE FIELDS OF SPECIAL AND GENERAL RELATIVITY, GRAVITATION, RELATIVISTIC ASTROPHYSICS, AND COSMOLOGY. THE PROBLEMS ARE EXPRESSED IN BROAD PHYSICAL TERMS TO ENHANCE THEIR PERTINENCE TO READERS WITH DIVERSE BACKGROUNDS. IN THEIR SOLUTIONS, THE AUTHORS HAVE ATTEMPTED TO CONVEY A MODE OF APPROACH TO THESE KINDS OF PROBLEMS, REVEALING PROCEDURES THAT CAN REDUCE THE

LABOR OF CALCULATIONS WHILE AVOIDING THE PITFALL OF TOO MUCH OR TOO POWERFUL FORMALISM. ALTHOUGH WELL SUITED FOR INDIVIDUAL USE, THE VOLUME MAY ALSO BE USED WITH ONE OF THE MODERN TEXTBOOKS IN GENERAL RELATIVITY.

RELATIVITY MADE RELATIVELY EASY ANDREW M. STEANE 2012-10-04 THIS BOOK UNFOLDS THE SUBJECT OF RELATIVITY FOR UNDERGRADUATE STUDENTS OF PHYSICS. IT FILLS A GAP BETWEEN INTRODUCTORY DESCRIPTIONS AND TEXTS FOR RESEARCHERS. ASSUMING ALMOST NO PRIOR KNOWLEDGE, IT ALLOWS THE STUDENT TO HANDLE ALL THE RELATIVITY NEEDED FOR A UNIVERSITY COURSE, WITH EXPLANATIONS AS SIMPLE, THOROUGH, AND ENGAGING AS POSSIBLE.

GRAVITY FROM THE GROUND UP BERNARD SCHUTZ 2003-12-04 THIS BOOK INVITES THE READER TO UNDERSTAND OUR UNIVERSE, NOT JUST MARVEL AT IT. FROM THE CLOCK-LIKE MOTIONS OF THE PLANETS TO THE CATASTROPHIC COLLAPSE OF A STAR INTO A BLACK HOLE, GRAVITY CONTROLS THE UNIVERSE. GRAVITY IS CENTRAL TO MODERN PHYSICS, HELPING TO ANSWER THE DEEPEST QUESTIONS ABOUT THE NATURE OF TIME, THE ORIGIN OF THE UNIVERSE AND THE UNIFICATION OF THE FORCES OF NATURE. LINKING KEY EXPERIMENTS AND OBSERVATIONS THROUGH CAREFUL PHYSICAL REASONING, THE AUTHOR BUILDS THE READER'S INSIGHT STEP-BY-STEP FROM SIMPLE BUT PROFOUND FACTS ABOUT GRAVITY ON EARTH TO THE FRONTIERS OF RESEARCH. TOPICS COVERED INCLUDE THE NATURE OF STARS AND GALAXIES, THE MYSTERIES OF DARK MATTER AND DARK ENERGY, BLACK HOLES, GRAVITATIONAL WAVES, INFLATION AND THE BIG BANG. SUITABLE FOR GENERAL READERS AND FOR UNDERGRADUATE COURSES, THE TREATMENT USES ONLY HIGH-SCHOOL LEVEL MATHEMATICS, SUPPLEMENTED BY OPTIONAL COMPUTER PROGRAMS, TO EXPLAIN THE LAWS OF PHYSICS GOVERNING GRAVITY.

A STUDENT'S GUIDE TO VECTORS AND TENSORS DANIEL A. FLEISCH 2011-09-22 VECTORS AND TENSORS ARE AMONG THE MOST POWERFUL PROBLEM-SOLVING TOOLS AVAILABLE, WITH APPLICATIONS RANGING FROM MECHANICS AND ELECTROMAGNETICS TO GENERAL RELATIVITY. UNDERSTANDING THE NATURE AND APPLICATION OF VECTORS AND TENSORS IS CRITICALLY IMPORTANT TO STUDENTS OF PHYSICS AND ENGINEERING. ADOPTING THE SAME APPROACH USED IN HIS HIGHLY POPULAR A STUDENT'S GUIDE TO MAXWELL'S EQUATIONS, FLEISCH EXPLAINS VECTORS AND TENSORS IN PLAIN LANGUAGE. WRITTEN FOR UNDERGRADUATE AND BEGINNING GRADUATE STUDENTS, THE BOOK PROVIDES A THOROUGH GROUNDING IN VECTORS AND VECTOR CALCULUS BEFORE TRANSITIONING THROUGH CONTRA AND COVARIANT COMPONENTS TO TENSORS AND THEIR APPLICATIONS. MATRICES AND THEIR ALGEBRA ARE REVIEWED ON THE BOOK'S SUPPORTING WEBSITE, WHICH ALSO FEATURES INTERACTIVE SOLUTIONS TO EVERY PROBLEM IN THE TEXT WHERE STUDENTS CAN WORK THROUGH A SERIES OF HINTS OR CHOOSE TO SEE THE ENTIRE SOLUTION AT ONCE. AUDIO PODCASTS GIVE STUDENTS THE OPPORTUNITY TO HEAR IMPORTANT CONCEPTS IN THE BOOK EXPLAINED BY THE AUTHOR.

PHYSICAL MATHEMATICS KEVIN CAHILL 2019-08-07 UNIQUE IN ITS CLARITY, EXAMPLES, AND RANGE, PHYSICAL MATHEMATICS EXPLAINS SIMPLY AND SUCCINCTLY THE MATHEMATICS THAT GRADUATE STUDENTS AND PROFESSIONAL PHYSICISTS NEED TO SUCCEED IN THEIR COURSES AND RESEARCH. THE BOOK ILLUSTRATES THE MATHEMATICS WITH NUMEROUS PHYSICAL EXAMPLES DRAWN FROM CONTEMPORARY RESEARCH. THIS SECOND EDITION HAS NEW CHAPTERS ON VECTOR CALCULUS, SPECIAL RELATIVITY AND ARTIFICIAL INTELLIGENCE AND MANY NEW SECTIONS AND EXAMPLES. IN ADDITION TO BASIC SUBJECTS SUCH AS LINEAR ALGEBRA, FOURIER ANALYSIS, COMPLEX VARIABLES, DIFFERENTIAL EQUATIONS, BESSEL FUNCTIONS, AND SPHERICAL HARMONICS, THE BOOK EXPLAINS TOPICS SUCH AS THE SINGULAR VALUE DECOMPOSITION, LIE ALGEBRAS AND GROUP THEORY, TENSORS AND GENERAL RELATIVITY, THE CENTRAL LIMIT THEOREM AND KOLMOGOROV'S THEOREMS, MONTE CARLO METHODS OF EXPERIMENTAL AND THEORETICAL PHYSICS, FEYNMAN'S PATH INTEGRALS, AND THE STANDARD MODEL OF COSMOLOGY.

A VISUAL INTRODUCTION TO DIFFERENTIAL FORMS AND CALCULUS ON MANIFOLDS JON PIERRE FORTNEY 2018-11-03 THIS BOOK EXPLAINS AND HELPS READERS TO DEVELOP GEOMETRIC INTUITION AS IT RELATES TO DIFFERENTIAL FORMS. IT INCLUDES OVER 250 FIGURES TO AID UNDERSTANDING AND ENABLE READERS TO VISUALIZE THE CONCEPTS BEING DISCUSSED. THE AUTHOR GRADUALLY BUILDS UP TO THE BASIC IDEAS AND CONCEPTS SO THAT DEFINITIONS, WHEN MADE, DO NOT APPEAR OUT OF NOWHERE, AND BOTH THE IMPORTANCE AND ROLE THAT THEOREMS PLAY IS EVIDENT AS OR BEFORE THEY ARE PRESENTED. WITH A CLEAR WRITING STYLE AND EASY-TO-UNDERSTAND MOTIVATIONS FOR EACH TOPIC, THIS BOOK IS PRIMARILY AIMED AT SECOND- OR THIRD-YEAR UNDERGRADUATE MATH AND PHYSICS STUDENTS WITH A BASIC KNOWLEDGE OF VECTOR CALCULUS AND LINEAR ALGEBRA.

RELATIVITY, GRAVITATION AND COSMOLOGY TA-PEI CHENG 2010 AN INTRODUCTION TO EINSTEIN'S GENERAL THEORY OF RELATIVITY, THIS WORK IS STRUCTURED SO THAT INTERESTING APPLICATIONS, SUCH AS GRAVITATIONAL LENSING, BLACK HOLES AND COSMOLOGY, CAN BE PRESENTED WITHOUT THE READERS HAVING TO FIRST LEARN THE DIFFICULT MATHEMATICS OF TENSOR CALCULUS.

CONSCIOUSNESS AND THE UNIVERSE: QUANTUM PHYSICS, EVOLUTION, BRAIN & MIND SIR ROGER PENROSE 2017-11-26 LIST PRICE: \$48.00 7" x 10" (17.78 x 25.4 cm) BLACK & WHITE ON WHITE PAPER 828 PAGES SCIENCE PUBLISHERS ISBN-13:

978-1938024511 ISBN-10: 1938024516 BISAC: SCIENCE / PHYSICS / QUANTUM THEORY IS CONSCIOUSNESS AN EPIPHENOMENAL HAPPENSTANCE OF THIS PARTICULAR UNIVERSE? OR DOES THE VERY CONCEPT OF A UNIVERSE DEPEND UPON ITS PRESENCE? DOES CONSCIOUSNESS MERELY PERCEIVE REALITY, OR DOES REALITY DEPEND UPON IT? DID CONSCIOUSNESS SIMPLY EMERGE AS AN EFFECT OF EVOLUTION? OR WAS IT, IN SOME SENSE, ALWAYS "OUT THERE" IN THE WORLD? THESE QUESTIONS AND MORE, ARE ADDRESSED IN THIS SPECIAL EDITION.

THE PARTICLE AT THE END OF THE UNIVERSE SEAN CARROLL 2013-08-27 EXAMINES THE EFFORT TO DISCOVER THE HIGGS BOSON PARTICLE BY TRACING THE DEVELOPMENT AND USE OF THE LARGE HADRON COLLIDER AND HOW ITS FINDINGS ARE DRAMATICALLY SHAPING SCIENTIFIC UNDERSTANDINGS WHILE ENABLING WORLD-CHANGING INNOVATIONS.

SPACETIME AND GEOMETRY SEAN M. CARROLL 2019-08-08 AN ACCESSIBLE INTRODUCTORY TEXTBOOK ON GENERAL RELATIVITY, COVERING THE THEORY'S FOUNDATIONS, MATHEMATICAL FORMALISM AND MAJOR APPLICATIONS.

GEOMETRICAL METHODS OF MATHEMATICAL PHYSICS BERNARD F. SCHUTZ 1980-01-28 IN RECENT YEARS THE METHODS OF MODERN DIFFERENTIAL GEOMETRY HAVE BECOME OF CONSIDERABLE IMPORTANCE IN THEORETICAL PHYSICS AND HAVE FOUND APPLICATION IN RELATIVITY AND COSMOLOGY, HIGH-ENERGY PHYSICS AND FIELD THEORY, THERMODYNAMICS, FLUID DYNAMICS AND MECHANICS. THIS TEXTBOOK PROVIDES AN INTRODUCTION TO THESE METHODS - IN PARTICULAR LIE DERIVATIVES, LIE GROUPS AND DIFFERENTIAL FORMS - AND COVERS THEIR EXTENSIVE APPLICATIONS TO THEORETICAL PHYSICS. THE READER IS ASSUMED TO HAVE SOME FAMILIARITY WITH ADVANCED CALCULUS, LINEAR ALGEBRA AND A LITTLE ELEMENTARY OPERATOR THEORY. THE ADVANCED PHYSICS UNDERGRADUATE SHOULD THEREFORE FIND THE PRESENTATION QUITE ACCESSIBLE. THIS ACCOUNT WILL PROVE VALUABLE FOR THOSE WITH BACKGROUNDS IN PHYSICS AND APPLIED MATHEMATICS WHO DESIRE AN INTRODUCTION TO THE SUBJECT. HAVING STUDIED THE BOOK, THE READER WILL BE ABLE TO COMPREHEND RESEARCH PAPERS THAT USE THIS MATHEMATICS AND FOLLOW MORE ADVANCED PURE-MATHEMATICAL EXPOSITIONS.

SPECIAL RELATIVITY MICHAEL TSAMPARLIS 2010-05-17 WRITING A NEW BOOK ON THE CLASSIC SUBJECT OF SPECIAL RELATIVITY, ON WHICH NUMEROUS IMPORTANT PHYSICISTS HAVE CONTRIBUTED AND MANY BOOKS HAVE ALREADY BEEN WRITTEN, CAN BE LIKE ADDING ANOTHER EPICYCLE TO THE PTOLEMAIC COSMOLOGY. FURTHERMORE, IT IS OUR BELIEF THAT IF A BOOK HAS NO NEW ELEMENTS, BUT SIMPLY REPEATS WHAT IS WRITTEN IN THE EXISTING LITERATURE, PERHAPS WITH A DIFFERENT STYLE, THEN THIS IS NOT ENOUGH TO JUSTIFY ITS PUBLICATION. HOWEVER, AFTER HAVING SPENT A NUMBER OF YEARS, BOTH IN CLASS AND RESEARCH WITH RELATIVITY, I HAVE COME TO THE CONCLUSION THAT THERE EXISTS A PLACE FOR A NEW BOOK. SINCE IT APPEARS THAT SOMEWHERE ALONG THE WAY, MATHEMATICS MAY HAVE OBSCURED AND PREVAILED TO THE DEGREE THAT WE TEND TO TEACH RELATIVITY (AND I BELIEVE, THEORETICAL PHYSICS) SIMPLY USING "HEAVIER" MATHEMATICS WITHOUT THE INSPIRATION AND THE MASTERY OF THE CLASSIC PHYSICISTS OF THE LAST CENTURY. MOREOVER CURRENT TRENDS ENCOURAGE THE APPLICATION OF TECHNIQUES IN PRODUCING QUICK RESULTS AND NOT TEDIOUS CONCEPTUAL APPROACHES RESULTING IN LONG-LASTING REASONING. ON THE OTHER HAND, PHYSICS CANNOT BE DONE A LA CARTE STRIPPED FROM PHILOSOPHY, OR, TO PUT IT IN A SIMPLE BUT DRAMATIC CONTEXT A BUILDING IS NOT AN ACCUMULATION OF STONES! AS A RESULT OF THE ABOVE, A MAJOR AIM IN THE WRITING OF THIS BOOK HAS BEEN THE DISTINCTION BETWEEN THE MATHEMATICS OF MINKOWSKI SPACE AND THE PHYSICS OF RELATIVITY.

RELATIVITY, GRAVITATION AND COSMOLOGY ROBERT J. LAMBOURNE 2010-06 THE TEXTBOOK INTRODUCES STUDENTS TO BASIC GEOMETRIC CONCEPTS, SUCH AS METRICS, CONNECTIONS AND CURVATURE, BEFORE EXAMINING GENERAL RELATIVITY IN MORE DETAIL. IT SHOWS THE OBSERVATIONAL EVIDENCE SUPPORTING THE THEORY, AND THE DESCRIPTION GENERAL RELATIVITY PROVIDES OF BLACK HOLES AND COSMOLOGICAL SPACETIMES. --

GRAVITATION T. PADMANABHAN 2010-01-28 COVERING ALL ASPECTS OF GRAVITATION IN A CONTEMPORARY STYLE, THIS ADVANCED TEXTBOOK IS IDEAL FOR GRADUATE STUDENTS AND RESEARCHERS IN ALL AREAS OF THEORETICAL PHYSICS. THE 'FOUNDATION' SECTION DEVELOPS THE FORMALISM IN SIX CHAPTERS, AND USES IT IN THE NEXT FOUR CHAPTERS TO DISCUSS FOUR KEY APPLICATIONS - SPHERICAL SPACETIMES, BLACK HOLES, GRAVITATIONAL WAVES AND COSMOLOGY. THE SIX CHAPTERS IN THE 'FRONTIER' SECTION DESCRIBE COSMOLOGICAL PERTURBATION THEORY, QUANTUM FIELDS IN CURVED SPACETIME, AND THE HAMILTONIAN STRUCTURE OF GENERAL RELATIVITY, AMONG SEVERAL OTHER ADVANCED TOPICS, SOME OF WHICH ARE COVERED IN-DEPTH FOR THE FIRST TIME IN A TEXTBOOK. THE MODULAR STRUCTURE OF THE BOOK ALLOWS DIFFERENT SECTIONS TO BE COMBINED TO SUIT A VARIETY OF COURSES. OVER 200 EXERCISES ARE INCLUDED TO TEST AND DEVELOP THE READER'S UNDERSTANDING. THERE ARE ALSO OVER 30 PROJECTS, WHICH HELP READERS MAKE THE TRANSITION FROM THE BOOK TO THEIR OWN ORIGINAL RESEARCH.

FROM ETERNITY TO HERE SEAN CARROLL 2010-10-26 "AN ACCESSIBLE AND ENGAGING EXPLORATION OF THE MYSTERIES OF

TIME." -BRIAN GREENE, AUTHOR OF THE ELEGANT UNIVERSE TWENTY YEARS AGO, STEPHEN HAWKING TRIED TO EXPLAIN TIME BY UNDERSTANDING THE BIG BANG. NOW, SEAN CARROLL SAYS WE NEED TO BE MORE AMBITIOUS. ONE OF THE LEADING THEORETICAL PHYSICISTS OF HIS GENERATION, CARROLL DELIVERS A DAZZLING AND PARADIGM-SHIFTING THEORY OF TIME'S ARROW THAT EMBRACES SUBJECTS FROM ENTROPY TO QUANTUM MECHANICS TO TIME TRAVEL TO INFORMATION THEORY AND THE MEANING OF LIFE. FROM ETERNITY TO HERE IS NO LESS THAN THE NEXT STEP TOWARD UNDERSTANDING HOW WE CAME TO EXIST, AND A FANTASTICALLY APPROACHABLE READ THAT WILL APPEAL TO A BROAD AUDIENCE OF ARMCHAIR PHYSICISTS, AND ANYONE WHO PONDERES THE NATURE OF OUR WORLD.

MODERN GENERAL RELATIVITY MIKE GUIDRY 2019-01-03 EINSTEIN'S GENERAL THEORY OF RELATIVITY IS WIDELY CONSIDERED TO BE ONE OF THE MOST ELEGANT AND SUCCESSFUL SCIENTIFIC THEORIES EVER DEVELOPED, AND IT IS INCREASINGLY BEING TAUGHT IN A SIMPLIFIED FORM AT ADVANCED UNDERGRADUATE LEVEL WITHIN BOTH PHYSICS AND MATHEMATICS DEPARTMENTS. DUE TO THE INCREASING INTEREST IN GRAVITATIONAL PHYSICS, IN BOTH THE ACADEMIC AND THE PUBLIC SPHERE, DRIVEN LARGELY BY WIDELY-PUBLICISED DEVELOPMENTS SUCH AS THE RECENT OBSERVATIONS OF GRAVITATIONAL WAVES, GENERAL RELATIVITY IS ALSO ONE OF THE MOST POPULAR SCIENTIFIC TOPICS PURSUED THROUGH SELF-STUDY. MODERN GENERAL RELATIVITY INTRODUCES THE READER TO THE GENERAL THEORY OF RELATIVITY USING AN EXAMPLE-BASED APPROACH, BEFORE DESCRIBING SOME OF ITS MOST IMPORTANT APPLICATIONS IN COSMOLOGY AND ASTROPHYSICS, SUCH AS GAMMA-RAY BURSTS, NEUTRON STARS, BLACK HOLES, AND GRAVITATIONAL WAVES. WITH HUNDREDS OF WORKED EXAMPLES, EXPLANATORY BOXES, AND END-OF-CHAPTER PROBLEMS, THIS TEXTBOOK PROVIDES A SOLID FOUNDATION FOR UNDERSTANDING ONE OF THE TOWERING ACHIEVEMENTS OF TWENTIETH-CENTURY PHYSICS.

A RELATIVIST'S TOOLKIT ERIC POISSON 2004-05-06 THIS 2004 TEXTBOOK FILLS A GAP IN THE LITERATURE ON GENERAL RELATIVITY BY PROVIDING THE ADVANCED STUDENT WITH PRACTICAL TOOLS FOR THE COMPUTATION OF MANY PHYSICALLY INTERESTING QUANTITIES. THE CONTEXT IS PROVIDED BY THE MATHEMATICAL THEORY OF BLACK HOLES, ONE OF THE MOST ELEGANT, SUCCESSFUL, AND RELEVANT APPLICATIONS OF GENERAL RELATIVITY. AMONG THE TOPICS DISCUSSED ARE CONGRUENCIES OF TIMELIKE AND NULL GEODESICS, THE EMBEDDING OF SPACELIKE, TIMELIKE AND NULL HYPERSURFACES IN SPACETIME, AND THE LAGRANGIAN AND HAMILTONIAN FORMULATIONS OF GENERAL RELATIVITY. ALTHOUGH THE BOOK IS SELF-CONTAINED, IT IS NOT MEANT TO SERVE AS AN INTRODUCTION TO GENERAL RELATIVITY. INSTEAD, IT IS MEANT TO HELP THE READER ACQUIRE ADVANCED SKILLS AND BECOME A COMPETENT RESEARCHER IN RELATIVITY AND GRAVITATIONAL PHYSICS. THE PRIMARY READERSHIP CONSISTS OF GRADUATE STUDENTS IN GRAVITATIONAL PHYSICS. IT WILL ALSO BE A USEFUL REFERENCE FOR MORE SEASONED RESEARCHERS WORKING IN THIS FIELD.

A STUDENT'S MANUAL FOR A FIRST COURSE IN GENERAL RELATIVITY ROBERT B. SCOTT 2016 THIS COMPREHENSIVE STUDENT MANUAL HAS BEEN DESIGNED TO ACCOMPANY THE LEADING TEXTBOOK BY BERNARD SCHUTZ, A FIRST COURSE IN GENERAL RELATIVITY, AND USES DETAILED SOLUTIONS, CROSS-REFERENCED TO SEVERAL INTRODUCTORY AND MORE ADVANCED TEXTBOOKS, TO ENABLE SELF-LEARNERS, UNDERGRADUATES AND POSTGRADUATES TO MASTER GENERAL RELATIVITY THROUGH PROBLEM SOLVING. THE PERFECT ACCOMPANIMENT TO SCHUTZ'S TEXTBOOK, THIS MANUAL GUIDES THE READER STEP-BY-STEP THROUGH OVER 200 EXERCISES, WITH CLEAR EASY-TO-FOLLOW DERIVATIONS. IT PROVIDES DETAILED SOLUTIONS TO ALMOST HALF OF SCHUTZ'S EXERCISES, AND INCLUDES 125 BRAND NEW SUPPLEMENTARY PROBLEMS THAT ADDRESS THE SUBTLE POINTS OF EACH CHAPTER. IT INCLUDES A COMPREHENSIVE INDEX AND COLLECTS USEFUL MATHEMATICAL RESULTS, SUCH AS TRANSFORMATION MATRICES AND CHRISTOFFEL SYMBOLS FOR COMMONLY STUDIED SPACETIMES, IN AN APPENDIX. SUPPORTED BY AN ONLINE TABLE CATEGORISING EXERCISES, A MAPLE WORKSHEET AND AN INSTRUCTORS' MANUAL, THIS TEXT PROVIDES AN INVALUABLE RESOURCE FOR ALL STUDENTS AND INSTRUCTORS USING SCHUTZ'S TEXTBOOK.

GENERAL RELATIVITY AND GRAVITATION ABHAY ASHTEKAR 2015-06 EXPLORE SPECTACULAR ADVANCES IN CONTEMPORARY PHYSICS WITH THIS UNIQUE CELEBRATION OF THE CENTENNIAL OF EINSTEIN'S DISCOVERY OF GENERAL RELATIVITY.

INTRODUCING EINSTEIN'S RELATIVITY RAY D'INVERNO 1995

GRAVITY JAMES B. HARTLE 2021-06-24 EINSTEIN'S THEORY OF GENERAL RELATIVITY IS A CORNERSTONE OF MODERN PHYSICS. IT ALSO TOUCHES UPON A WEALTH OF TOPICS THAT STUDENTS FIND FASCINATING - BLACK HOLES, WARPED SPACETIME, GRAVITATIONAL WAVES, AND COSMOLOGY. NOW REISSUED BY CAMBRIDGE UNIVERSITY PRESS, THIS GROUND-BREAKING TEXT HELPED TO BRING GENERAL RELATIVITY INTO THE UNDERGRADUATE CURRICULUM, MAKING IT ACCESSIBLE TO VIRTUALLY ALL PHYSICS MAJORS. ONE OF THE PIONEERS OF THE 'PHYSICS-FIRST' APPROACH TO THE SUBJECT, RENOWNED RELATIVIST JAMES B. HARTLE, RECOGNIZED THAT THERE IS TYPICALLY NOT ENOUGH TIME IN A SHORT INTRODUCTORY COURSE FOR THE TRADITIONAL, MATHEMATICS-FIRST, APPROACH. IN THIS TEXT, HE PROVIDES A FLUENT AND ACCESSIBLE PHYSICS-FIRST INTRODUCTION TO GENERAL

RELATIVITY THAT BEGINS WITH THE ESSENTIAL PHYSICAL APPLICATIONS AND USES A MINIMUM OF NEW MATHEMATICS. THIS MARKET-LEADING TEXT IS IDEAL FOR A ONE-SEMESTER COURSE FOR UNDERGRADUATES, WITH ONLY INTRODUCTORY MECHANICS AS A PREREQUISITE.

SOMETHING DEEPLY HIDDEN SEAN CARROLL 2020-09-01 INSTANT NEW YORK TIMES BESTSELLER A SCIENCE NEWS FAVORITE SCIENCE BOOK OF 2019 AS YOU READ THESE WORDS, COPIES OF YOU ARE BEING CREATED. SEAN CARROLL, THEORETICAL PHYSICIST AND ONE OF THIS WORLD'S MOST CELEBRATED WRITERS ON SCIENCE, REWRITES THE HISTORY OF TWENTIETH-CENTURY PHYSICS. ALREADY HAILED AS A MASTERPIECE, SOMETHING DEEPLY HIDDEN SHOWS FOR THE FIRST TIME THAT FACING UP TO THE ESSENTIAL PUZZLE OF QUANTUM MECHANICS UTTERLY TRANSFORMS HOW WE THINK ABOUT SPACE AND TIME. HIS RECONCILING OF QUANTUM MECHANICS WITH EINSTEIN'S THEORY OF RELATIVITY CHANGES, WELL, EVERYTHING. MOST PHYSICISTS HAVEN'T EVEN RECOGNIZED THE UNCOMFORTABLE TRUTH: PHYSICS HAS BEEN IN CRISIS SINCE 1927. QUANTUM MECHANICS HAS ALWAYS HAD OBVIOUS GAPS—WHICH HAVE COME TO BE SIMPLY IGNORED. SCIENCE POPULARIZERS KEEP TELLING US HOW WEIRD IT IS, HOW IMPOSSIBLE IT IS TO UNDERSTAND. ACADEMICS DISCOURAGE STUDENTS FROM WORKING ON THE "DEAD END" OF QUANTUM FOUNDATIONS. PUTTING HIS PROFESSIONAL REPUTATION ON THE LINE WITH THIS AUDACIOUS YET ENTIRELY REASONABLE BOOK, CARROLL SAYS THAT THE CRISIS CAN NOW COME TO AN END. WE JUST HAVE TO ACCEPT THAT THERE IS MORE THAN ONE OF US IN THE UNIVERSE. THERE ARE MANY, MANY SEAN CARROLLS. MANY OF EVERY ONE OF US. COPIES OF YOU ARE GENERATED THOUSANDS OF TIMES PER SECOND. THE MANY-WORLDS THEORY OF QUANTUM BEHAVIOR SAYS THAT EVERY TIME THERE IS A QUANTUM EVENT, A WORLD SPLITS OFF WITH EVERYTHING IN IT THE SAME, EXCEPT IN THAT OTHER WORLD THE QUANTUM EVENT DIDN'T HAPPEN. STEP-BY-STEP IN CARROLL'S UNIQUELY LUCID WAY, HE TACKLES THE MAJOR OBJECTIONS TO THIS OTHERWORLDLY REVELATION UNTIL HIS CASE IS INESCAPABLY ESTABLISHED. RARELY DOES A BOOK SO FULLY REORGANIZE HOW WE THINK ABOUT OUR PLACE IN THE UNIVERSE. WE ARE ON THE THRESHOLD OF A NEW UNDERSTANDING—OF WHERE WE ARE IN THE COSMOS, AND WHAT WE ARE MADE OF.

PROBLEM BOOK IN RELATIVITY AND GRAVITATION ALAN P. LIGHTMAN 2017-09-01 AN ESSENTIAL RESOURCE FOR LEARNING ABOUT GENERAL RELATIVITY AND MUCH MORE, FROM FOUR LEADING EXPERTS IMPORTANT AND USEFUL TO EVERY STUDENT OF RELATIVITY, THIS BOOK IS A UNIQUE COLLECTION OF SOME 475 PROBLEMS--WITH SOLUTIONS--IN THE FIELDS OF SPECIAL AND GENERAL RELATIVITY, GRAVITATION, RELATIVISTIC ASTROPHYSICS, AND COSMOLOGY. THE PROBLEMS ARE EXPRESSED IN BROAD PHYSICAL TERMS TO ENHANCE THEIR PERTINENCE TO READERS WITH DIVERSE BACKGROUNDS. IN THEIR SOLUTIONS, THE AUTHORS HAVE ATTEMPTED TO CONVEY A MODE OF APPROACH TO THESE KINDS OF PROBLEMS, REVEALING PROCEDURES THAT CAN REDUCE THE LABOR OF CALCULATIONS WHILE AVOIDING THE PITFALL OF TOO MUCH OR TOO POWERFUL FORMALISM. ALTHOUGH WELL SUITED FOR INDIVIDUAL USE, THE VOLUME MAY ALSO BE USED WITH ONE OF THE MODERN TEXTBOOKS IN GENERAL RELATIVITY.

INTRODUCTION TO GENERAL RELATIVITY AND COSMOLOGY CHRISTIAN G BOEHMER 2016-10-06 INTRODUCTION TO GENERAL RELATIVITY AND COSMOLOGY GIVES UNDERGRADUATE STUDENTS AN OVERVIEW OF THE FUNDAMENTAL IDEAS BEHIND THE GEOMETRIC THEORY OF GRAVITATION AND SPACETIME. THROUGH POINTERS ON HOW TO MODIFY AND GENERALISE EINSTEIN'S THEORY TO ENHANCE UNDERSTANDING, IT PROVIDES A LINK BETWEEN STANDARD TEXTBOOK CONTENT AND CURRENT RESEARCH IN THE FIELD. CHAPTERS PRESENT COMPLICATED MATERIAL PRACTICALLY AND CONCISELY, INITIALLY DEALING WITH THE MATHEMATICAL FOUNDATIONS OF THE THEORY OF RELATIVITY, IN PARTICULAR DIFFERENTIAL GEOMETRY. THIS IS FOLLOWED BY A DISCUSSION OF THE EINSTEIN FIELD EQUATIONS AND THEIR VARIOUS PROPERTIES. ALSO GIVEN IS ANALYSIS OF THE IMPORTANT SCHWARZSCHILD SOLUTIONS, FOLLOWED BY APPLICATION OF GENERAL RELATIVITY TO COSMOLOGY. QUESTIONS WITH FULLY WORKED ANSWERS ARE PROVIDED AT THE END OF EACH CHAPTER TO AID COMPREHENSION AND GUIDE LEARNING. THIS PARED DOWN TEXTBOOK IS SPECIFICALLY DESIGNED FOR NEW STUDENTS LOOKING FOR A WORKABLE, SIMPLE PRESENTATION OF SOME OF THE KEY THEORIES IN MODERN PHYSICS AND MATHEMATICS.

THE GEOMETRY OF SPACETIME JAMES J. CALLAHAN 2013-03-09 HERMANN MINKOWSKI RECAST SPECIAL RELATIVITY AS ESSENTIALLY A NEW GEOMETRIC STRUCTURE FOR SPACETIME. THIS BOOK LOOKS AT THE IDEAS OF BOTH EINSTEIN AND MINKOWSKI, AND THEN INTRODUCES THE THEORY OF FRAMES, SURFACES AND INTRINSIC GEOMETRY, DEVELOPING THE MAIN IMPLICATIONS OF EINSTEIN'S GENERAL RELATIVITY THEORY.