

1. Record Nr.	UNISA996495170703316
Titolo	Developments in Lorentzian geometry : GeLoCor 2021, Cordoba, Spain, February 1-5 // edited by Alma L. Albujaer [and four others]
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2022] ©2022
ISBN	3-031-05379-6
Descrizione fisica	1 online resource (323 pages)
Collana	Springer Proceedings in Mathematics and Statistics ; ; v.389
Disciplina	516
Soggetti	Geometry, Differential General relativity (Physics) Geometria diferencial Relativitat general (Física) Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Intro -- Organization -- Preface -- Contents -- Semi-Riemannian Cones with Parallel Null Planes -- 1 Introduction -- 2 The Induced Structure on the Base -- 3 Consequences of the Fundamental Equations -- 4 The Local Form of the Metric on the Base -- References -- Nilpotent Structures of Neutral 4-Manifolds and Light-Like Surfaces -- 1 Introduction -- 2 Complex Structures and Paracomplex Structures of 4-Dimensional Neutral Vector Spaces -- 3 Nilpotent Structures of 4-Dimensional Neutral Vector Spaces -- 4 Almost Complex Structures and Almost Paracomplex Structures of Neutral 4-Manifolds -- 5 Almost Nilpotent Structures of Neutral 4-Manifolds -- 6 Light-Like Surfaces in Neutral 4-Manifolds -- References -- Positive Energy Theorems in Fourth-Order Gravity -- 1 Introduction -- 2 Preliminaries -- 3 Conservation Principles and Fourth Order Energy -- 4 Positive Energy Theorem for Einstein Metrics -- 5 Positive Energy Theorem for Stationary Solutions -- 6 The Q-Curvature Positive Mass Theorem -- References -- Curvature and Killing Vector Fields on Lorentzian 3-Manifolds -- 1 Introduction -- 2 The Newman-Penrose Formalism for Lorentzian 3-Manifolds -- 3 The Newman-Penrose Formalism and

Global Obstructions -- 3.1 Evolution Equations for Divergence, Twist, and Shear -- 4 The Newman-Penrose Formalism and Local Classifications -- 4.1 The Riemannian Case -- 4.2 Local Coordinates -- 4.3 The Local Classification -- 4.4 The Lorentzian Setting -- References -- Bochner-Flat Para-Kähler Surfaces -- 1 Introduction -- 2 Walker Structures -- 2.1 Self-Dual Walker Manifolds -- 3 Bochner-Flat Para-Kähler Surfaces -- 3.1 Bochner-Flat Para-Kähler Surfaces of Constant Scalar Curvature -- 3.2 Some Examples of Bochner-Flat Para-Kähler Structures of Non-constant Scalar Curvature -- References -- Remarks on the Existence of CMC Cauchy Surfaces -- 1 Introduction. 2 Some CMC Existence Results -- 2.1 CMC Existence Result from a Spacetime Curvature Condition -- 2.2 CMC Existence Result Related to a Conjecture of Dilts and Holst -- 3 Remarks on the Conformal Structure of Cosmological Spacetimes -- References -- Lorentzian Area and Volume Estimates for Integral Mean Curvature Bounds -- 1 Introduction -- 2 Background -- 2.1 Our Setting -- 2.2 Comparison Spaces -- 2.3 The Cosmological Time Function and Its Properties -- 3 Area and Volume Estimates -- 3.1 Basic Area and Volume Estimates Using Integral Mean Curvature Bounds -- 3.2 Proof of Theorem 2 -- 4 Generalized Area Estimates for MathID486t -- 5 Extending Theorem 2 to Subsets and Non-compact MathID519 with Finite Area -- 6 Example: For $p < n$, Bounds on the upper L^p -Norm of upper H are Insufficient for the Estimates (47), (48) -- References -- Null Hypersurfaces and the Rigged Metric -- 1 Introduction -- 2 Characterization of a Null Cone -- 3 Codimension Two Spacelike Submanifolds Through a Null Hypersurface -- References -- Spacelike Causal Boundary at Finite Distance and Continuous Extension of the Metric: A Preliminary Report -- 1 Introduction -- 2 Spacelike Causal Boundary at Finite Distance -- 3 C^0 Extension of the Metric to the Causal Boundary -- References -- Lightlike Hypersurfaces and Time-Minimizing Geodesics in Cone Structures -- 1 Introduction -- 2 Preliminary Notions on Cone Structures -- 3 Lightlike Hypersurfaces -- 4 Smoothness of Achronal Boundaries -- 5 Minimization Properties of Cone Geodesics -- References -- Anisotropic Connections and Parallel Transport in Finsler Spacetimes -- 1 Introduction -- 2 General Background -- 2.1 Pseudo-Finsler Metrics -- 2.2 Finsler Spacetimes and Its Restspace -- 3 Anisotropic Connections -- 3.1 Anisotropic Tensor Fields and Their Vertical Derivatives. 3.2 Basic Notion of Anisotropic Connection -- 3.3 Extension to a Covariant Derivative of Anisotropic Tensors -- 4 Anisotropic Versus Nonlinear Connections -- 4.1 Setting for Nonlinear Connections -- 4.2 Interplay Between Anisotropic Connections and Nonlinear Ones -- 5 Anisotropic Versus Linear Connections -- 5.1 Linear Connections on $V \rightarrow A$ -- 5.2 Anisotropic Connections as Vertically Trivial Linear Connections -- 6 Anisotropic Versus Finsler Connections -- 6.1 The Metric Spray -- 6.2 The Finslerian Linear Connections -- 7 Parallel Transport and Anisotropic Connections -- 7.1 Observers and Parallel Transport -- 7.2 Recovering the Anisotropic Connection from the Transport -- 7.3 Levi-Civita-Chern Connection of a Finsler Spacetime -- References -- Stability of Pseudo-Kähler Manifolds and Cohomological Decomposition -- 1 Introduction -- 2 Bott-Chern Cohomology and Pseudo-Kähler Stability -- 3 Cohomological Decomposition and Stability -- 4 Cohomologically Pseudo-Kähler Solvmanifolds -- References -- Singularity Scattering Laws for Bouncing Cosmologies: A Brief Overview -- 1 Introduction -- 2 Global Nonlinear Stability of Einstein Spacetimes -- 2.1 Background -- 2.2 Self-gravitating Massive Matter Field -- 3 Spacetimes with Singularity

Hypersurfaces -- 3.1 Our Standpoint -- 3.2 Formulation of the Problem -- 4 Fundamental Notions and Local Existence Theory -- 4.1 A Construction Scheme -- 4.2 Singularity Data and Asymptotic Profiles -- 4.3 Cyclic Spacetimes -- 4.4 Existence and Asymptotic Properties of Cyclic Spacetimes -- 5 Classification of Scattering Maps -- 5.1 Terminology -- 5.2 Main Classification Results -- 5.3 The Three Universal Laws of Quiescent Bouncing Cosmology -- 5.4 Role of the Small-Scale Physics -- References -- -Contact Structures and Six-Dimensional Supergravity -- 1 Introduction -- 2 -Contact Metric Structures.

3 Null Contact Metric Structures -- 3.1 Sasakian and K-Contact Null Contact Structures -- 4 -Einstein Structures and Six-Dimensional Supergravity -- References -- Geometry of Null Hypersurfaces in Lorentzian Space Forms -- 1 Introduction -- 2 The General Framework -- 3 Conformality: Definition, Examples and Related Results -- 4 Null Screen Isoparametric Hypersurfaces -- 5 Null Einstein Hypersurfaces -- References -- Dynamics of Relativistic Particles with Torsion in Certain Non-flat Spacetimes -- 1 Introduction -- 2 Generalities -- 2.1 Calculus of Variations -- 2.2 Equations of Motion -- 3 Set up -- 4 Trajectories in Generalized Robertson-Walker Spacetimes -- 4.1 Frenet Frame -- 4.2 The Curvature Functional -- 4.3 The Torsion Functional -- 5 Trajectories in Standard Static Spacetimes -- 5.1 Frenet Frame -- 5.2 The Curvature Functional -- 5.3 The Torsion Functional -- 6 Discussion -- References -- The Half-Space Model of Pseudo-hyperbolic Space -- 1 Introduction -- 2 First Definitions and Properties -- 2.1 The Half-Space Model -- 2.2 An Isometric Embedding -- 2.3 Symmetries -- 3 Totally Geodesic Submanifolds -- 3.1 The Geodesic Equations -- 3.2 Totally Geodesic Hypersurfaces -- 3.3 The General Classification -- 4 Geodesics -- 4.1 Lightlike Geodesics -- 4.2 A Preliminary Computation -- 4.3 Timelike Geodesics -- 4.4 Spacelike Geodesics -- 5 The Boundary at Infinity -- 5.1 The Extended Embedding -- 5.2 The Full Boundary in the Half-Space Model -- 5.3 Examples -- 5.4 Geodesics Revisited -- 6 Horospheres -- 7 Isometries -- 7.1 The Isometry Group $\text{Isom}(\mathbb{H}^p, q)$ -- 7.2 Inversions -- 7.3 Action of $\text{Isom}(\mathbb{H}^p, q)$ -- References -- Author Index.
