

Contents

Introduction	ix
CHAPTER 1 CONFORMAL AND PSEUDOCONFORMAL SPACES	1
1.1 Conformal transformations and conformal spaces	1
1.2 Moving frames in a conformal space	8
1.3 Pseudoconformal spaces	14
1.4 Examples of pseudoconformal spaces	19
Notes	28
CHAPTER 2 HYPERSURFACES IN CONFORMAL SPACES	31
2.1 Fundamental objects and tensors of a hypersurface	31
2.2 Invariant normalization of hypersurfaces	40
2.3 The rigidity theorem and the fundamental theorem	45
2.4 Curvature lines of a hypersurface	52
2.5 Geometric problems connected with the tensor c_{ij}	61
Notes	70
CHAPTER 3 SUBMANIFOLDS IN CONFORMAL AND PSEUDOCONFORMAL SPACES	73
3.1 Geometry of a submanifold in a conformal space	73
3.2 Submanifolds carrying a net of curvature lines	89
3.3 Submanifolds in a pseudoconformal space	100
3.4 Line submanifolds of a three-dimensional projective space	108
Notes	115

CHAPTER 4	CONFORMAL STRUCTURES ON A DIFFERENTIABLE MANIFOLD	119
4.1	A manifold with a conformal structure	119
4.2	Weyl connections and Riemannian metrics compatible with a conformal structure	132
4.3	A conformal structure on submanifolds of a conformal space	141
4.4	A conformal structure on a hypersurface of a projective space	150
	Notes	160
CHAPTER 5	THE FOUR-DIMENSIONAL CONFORMAL STRUCTURES	163
5.1	Structure equations of the $CO(2, 2)$ -structure	163
5.2	The $CO(1, 3)$ -structure and the $CO(4, 0)$ -structure	169
5.3	The Hodge operator	176
5.4	Completely isotropic submanifolds of four-dimensional conformal structures	183
5.5	Four-dimensional webs and $CO(2, 2)$ -structures	193
5.6	Conformal structures of some metrics in general relativity	202
5.7	Conformal structures on a four-dimensional hypersurface	208
	Notes	217
CHAPTER 6	GEOMETRY OF THE GRASSMANN MANIFOLD	221
6.1	Analytic geometry of the Grassmannian and the Grassmann mapping	222
6.2	Geometry of the Grassmannian $G(1, 4)$	232
6.3	Differential geometry of the Grassmannian	236
6.4	Submanifolds of the Grassmannian $G(m, n)$	244
6.5	Normalization of the Grassmann manifold	252
6.6	Homogeneous normalization of the Grassmann manifold	260
	Notes	265

CHAPTER 7	MANIFOLDS ENDOWED WITH ALMOST GRASSMANN STRUCTURES	267
7.1	Almost Grassmann structures on a differentiable manifold	267
7.2	Structure equations and torsion tensor of an almost Grassmann manifold	274
7.3	The complete structure object of an almost Grassmann manifold	281
7.4	Manifolds endowed with semiintegrable almost Grassmann structures	292
7.5	Multidimensional $(p + 1)$ -webs and almost Grassmann structures associated with them	301
7.6	Grassmann $(p + 1)$ -webs	305
7.7	Transversally geodesic and isoclinic $(p + 1)$ -webs	309
7.8	Grassmannizable d -webs	314
	Notes	319
	Bibliography	323
	Symbols Frequently Used	355
	Author Index	359
	Subject Index	363