

Contents

Preface	vii
Part 1. Background	1
Chapter 1. Cartan geometries	3
1.1. Prologue — a few examples of homogeneous spaces	4
1.2. Some background from differential geometry	15
1.3. A survey on connections	35
1.4. Geometry of homogeneous spaces	49
1.5. Cartan connections	70
1.6. Conformal Riemannian structures	112
Chapter 2. Semisimple Lie algebras and Lie groups	141
2.1. Basic structure theory of Lie algebras	141
2.2. Complex semisimple Lie algebras and their representations	160
2.3. Real semisimple Lie algebras and their representations	199
Part 2. General theory	231
Chapter 3. Parabolic geometries	233
3.1. Underlying structures and normalization	234
3.2. Structure theory and classification	290
3.3. Kostant's version of the Bott–Borel–Weil theorem	339
Historical remarks and references for Chapter 3	360
Chapter 4. A panorama of examples	363
4.1. Structures corresponding to $ 1 $ -gradings	363
4.2. Parabolic contact structures	402
4.3. Examples of general parabolic geometries	426
4.4. Correspondence spaces and twistor spaces	455
4.5. Analogs of the Fefferman construction	478
Chapter 5. Distinguished connections and curves	497
5.1. Weyl structures and scales	498
5.2. Characterization of Weyl structures	517
5.3. Canonical curves	558

Appendix A. Other prolongation procedures	599
Appendix B. Tables	607
Bibliography	617
Index	623

Copyright © 2009 by the American Mathematical Society. Reverts to public domain 2030.

This page is intentionally left blank.

Copyright © 2009 by the American Mathematical Society. Reverts to public domain 2030.

This page is intentionally left blank.

Copyright © 2009 by the American Mathematical Society. Reverts to public domain 2030.

This page is intentionally left blank.

Copyright © 2009 by the American Mathematical Society. Reverts to public domain 2030.

This page is intentionally left blank.

Copyright © 2009 by the American Mathematical Society. Reverts to public domain 2030.

This page is intentionally left blank.

Copyright © 2009 by the American Mathematical Society. Reverts to public domain 2030.

This page is intentionally left blank.

Copyright © 2009 by the American Mathematical Society. Reverts to public domain 2030.

This page is intentionally left blank.

Copyright © 2009 by the American Mathematical Society. Reverts to public domain 2030.

This page is intentionally left blank.

Copyright © 2009 by the American Mathematical Society. Reverts to public domain 2030.

This page is intentionally left blank.

Copyright © 2009 by the American Mathematical Society. Reverts to public domain 2030.

This page is intentionally left blank.

Copyright © 2009 by the American Mathematical Society. Reverts to public domain 2030.

This page is intentionally left blank.

Copyright © 2009 by the American Mathematical Society. Reverts to public domain 2030.

This page is intentionally left blank.

Copyright © 2009 by the American Mathematical Society. Reverts to public domain 2030.

This page is intentionally left blank.