

CONTENTS

FOREWORD	VII
1 INTRODUCTION AND MOTIVATIONS.	1
2 MATHEMATICAL PRELIMINARIES.	28
2.1 Elements of Geometry.	28
2.2 The Nonsymmetric Tensor on a Lie Group.	34
2.3 The Nonsymmetric Metrication of a Bundle P.	47
3. THE NONSYMMETRIC KALUZA-KLEIN (JORDAN-THIRY)	
THEORY IN AN ELECTROMAGNETIC CASE.	57
3.1 Introduction.	57
3.2 Formulation of the Nonsymmetric Kaluza-Klein (Jordan-Thiry) Theory.	65
3.3 Geodetic Equations.	69
3.4 Geometry on the Manifold P.	72
3.5 Conformal Transformation of $g_{\mu\nu}$. Transformation of the Scalar Field ρ	77
3.6 The Variational Principle and Field Equations - Interpretations and Conclusions.	78
3.7 Equations of Motion for a Test Particle. Additional Conclusions.	92
3.8 Material Sources. Palatini Variational Principle and Field Equations (Kaluza-Klein Case).	109
3.9 Spin Sources.	114
3.10 Geodetic Equations in the Case of Non-zero Sources.	118
3.11 Numerical Predictions of the Theory.	124
3.12 Spin Sources. Weak Field Approximation of Generalized Cartan Equation	130
3.13 Linearization of the Nonsymmetric Kaluza-Klein Theory in an Electromagnetic Case.	133
3.14 Equations of Motion for a Test Particle in a Linear Approximation.	138
3.15 The Geodetic Equations in a General Case and	

Geodetic Deviation Equations.	139
3.16 Field Equations for the Nonsymmetric Kaluza-Klein Theory (Case with p-1).	148
3.17 Spherically-Symmetric Fields in the Nonsymmetric Kaluza-Klein Theory.	150
3.18 Static, Spherically-Symmetric Solution.	156
3.19 The Test Particle Motion in the Exact Solution in NK^2T	172
3.20 Summary of the Properties of the Solution and Some Prospects for Further Research.	179
4 THE NONSYMMETRIC KALUZA-KLEIN (JORDAN-THIRY) THEORY IN A GENERAL, NONABELIAN CASE.	185
4.1 Introduction.	185
4.2 Formulation of the Nonsymmetric. Nonabelian Jordan-Thiry Theory.	191
4.3 Geodetic Equations.	195
4.4 Geometry of the Manifold P.	204
4.5 Connection $\tilde{\omega}_b^a$, Cosmological Constant.	215
4.6 Conformal Transformation of $g_{\mu\nu}$. Transformation of the Scalar Field p.	225
4.7 Gauge Invariance of the Lagrangian.	227
4.8 Variational Principle. Equations of Fields. Interpretations and Conclusions.	230
4.9 Special Cases.	245
4.10 Linearization of the Nonsymmetric-Nonabelian Kaluza-Klein Theory (General Case).	247
4.11 Geodetic Equations in a Linear Approximation.	261
4.12 Equation of Motion for a Test Particle and Geodetic Deviation Equations.	262
4.13 Conclusions and Prospects.	282
5 SPONTANEOUS SYMMETRY BREAKING AND HIGGS¹ MECHANISM IN THE NONSYMMETRIC JORDAN-THIRY THEORY.	296
5.1 Introduction.	297

5.2 Preliminary Remarks.	30	5
5.3 The Nonsymmetric Jordan-Thiry Theory over $V = E \times G_0$.	324	
5.4 IDimensional Reduction Procedure.	33	6
5.5 (Conformal Transformation of $g_{\mu\nu}$. Transformation of the Scalar Field ρ .)	35	3
5.6 Symmetry Breaking. Mass Generation. Cosmological Constant.	35	5
5.7 Variational Principle. Equations of Fields. Interpretation of the Scalar Field Ψ .)	38	2
5.8 Properties of the Scalar Field Ψ . Cosmological Irifting.of the Mass Scale.	39	1
5.9 Fermion Number, R, and U(1). Invariance.)	39	4
5.10 FFermion Number as the Second Gravitational Charge. \tilde{W}_μ and \tilde{A}^μ Potentials.)	40	1
5.11 Equations of Motion for a Test Particle in the Nonsymmetric Jordan-Thiry Theory.	41	5
5.12 On a Cosmological Origin of the Mass of the Scalar Field Ψ (or ρ).)	41	9
5.13 Geodetic Equation on the Manifold P.	42	5
5.14 A Tower of Scalar Fields in the Nonsymmetric- Nonabelian Jordan-Thiry Theory.	43	1
5.15 The Approximation Procedure for the Lagrangian of the Higgs' Field in the Nonsymmetric Jordan-Thiry Theory.	45	0
6. SOME PROSPECTS FOR FURTHER RESEARCH AND CONCLUSIONS]	47	3
7. APPENDIX A]	48	0
8 APPENDIX B]	48	4
9 APPENDIX C.	49	5
10. ACKNOWLEDGMENTS.	50	4
11. REFERENCES.	50	5