

CONTENTS

Volume I

From the Editors	v
<i>M. Shifman, A. Vainshtein and J. Wheeler</i>	
List of Contributors	vii
Part 1: Personal Notes	1
Ian's Universe	3
<i>Bella Kogan</i>	
This is How It Was ...	5
<i>Ilya Kogan</i>	
Ian Kogan	62
<i>M. Shifman</i>	
My Recollections of Ian Kogan	66
<i>B.L. Ioffe</i>	
Ian in Balliol	68
<i>J. Hodby</i>	
Ian in the Department	70
<i>J.F. Wheeler</i>	
Part 2: From Fields to Strings	73
1. QCD and Field Theory	75
Diquarks as Inspiration and as Objects	77
<i>F. Wilczek</i>	
The Influence of Baryons on the Chiral Phase Transition in QCD	94
<i>M.N. Chernodub and B.L. Ioffe</i>	

x

QCD Functional Integrals for Systems with Nonzero Chemical Potential <i>T.D. Cohen</i>	101
Variational Techniques in Non-perturbative QCD <i>A. Kovner and J.G. Milhano</i>	121
3D Georgi–Glashow Model and Confining Strings at Zero and Finite Temperatures <i>D. Antonov and M.C. Diamantini</i>	188
Integrability in QCD and Beyond <i>A.V. Belitsky, V.M. Braun, A.S. Gorsky and G.P. Korchemsky</i>	266
From Super–Yang–Mills Theory to QCD: Planar Equivalence and its Implications <i>A. Armoni, M. Shifman and G. Veneziano</i>	353
Heisenberg–Euler Effective Lagrangians : Basics and Extensions <i>G.V. Dunne</i>	445
Low-dimensional Sisters of Seiberg–Witten Effective Theory <i>A.V. Smilga</i>	523
Non-analyticities in Three-dimensional Gauge Theories <i>M. Asorey, D. Garcia-Alvarez and J.L. Lopez</i>	559
Small Instantons, Little Strings and Free Fermions <i>A. Losev, A. Marshakov and N. Nekrasov</i>	581
Gauge Theory Amplitudes, Scalar Graphs and Twistor Space <i>V.V. Khoze</i>	622
2. Condensed Matter	659
Aspects of Confinement in Low Dimensions <i>M.J. Bhaseen and A.M. Tsvetik</i>	661
Application of Massive Integrable QFTs to Problems in Condensed Matter Physics <i>F.H.L. Essler and R.M. Konik</i>	684
Fuzzy Spaces, the M(atric) Model and the Quantum Hall Effect <i>D. Karabali, V.P. Nair and S. Randjbar-Daemi</i>	831

Volume II

3. Unification, Extra Dimensions, Cosmology	877
The Quest for Unification	879
<i>G.G. Ross</i>	
Chaos, Symmetry and String Cosmology	923
<i>T. Damour</i>	
Extra Dimensions and Branes	967
<i>C. Csáki</i>	
Looking At The Cosmological Constant from Infinite-Volume Bulk	1061
<i>G. Gabadadze</i>	
New Old Inflation	1131
<i>G. Dvali and S. Kachru</i>	
4. Conformal Theories	1157
Conformal Fixed Points of Unidentified Gauge Theories	1159
<i>A.M. Polyakov</i>	
SL(2,Z) Action on Three-Dimensional Conformal Field Theories with Abelian Symmetry	1173
<i>E. Witten</i>	
Logarithmic Conformal Field Theory or How to Compute a Torus Amplitude on the Sphere	1201
<i>M. Flohr</i>	
Logarithmic Conformal Field Theories and Strings in Changing Backgrounds	1257
<i>N.E. Mavromatos</i>	
Finite Density States in Integrable Conformal Field Theories	1365
<i>N. Mann and J. Polchinski</i>	
Conformal Field Theory at Central Charge $c = 0$ and Two-Dimensional Critical Systems with Quenched Disorder	1384
<i>V. Gurarie and A. W. W. Ludwig</i>	
Boundary States and Broken Bulk Symmetries in WA_r Minimal Models	1441
<i>A.F. Caldeira and J.F. Wheeler</i>	

xii

5. AdS/CFT Correspondence	1471
Lectures on AdS/CFT	1473
<i>J. Maldacena</i>	
The Search for a Holographic Dual to $AdS_3 \times S^3 \times S^3 \times S^1$	1519
<i>S. Gukov, E. Martinec, G. Moore and A. Strominger</i>	
Chern-Simons Gauge Theory and the AdS_3/CFT_2 Correspondence	1606
<i>S. Gukov, E. Martinec, G. Moore and A. Strominger</i>	
Spinning Strings and AdS/CFT Duality	1648
<i>A.A. Tseytlin</i>	
R-symmetries, Algebraic Geometry, and AdS/CFT	1708
<i>A. Ritz</i>	

Volume III

6. Strings	1729
The Three-String Vertex for a Plane-Wave Background	1731
<i>J.H. Schwarz</i>	
Supersymmetry Breaking in the Anthropic Landscape	1745
<i>L. Susskind</i>	
The Sirens of Eleven Dimensions	1750
<i>P. Ramond</i>	
A New Hat for the $c = 1$ Matrix Model	1758
<i>M.R. Douglas, I.R. Klebanov, D. Kutasov, J. Maldacena, E. Martinec and N. Seiberg</i>	
Mirror Symmetry and Closed String Tachyon Condensation	1828
<i>C. Vafa</i>	
AdS and dS Entropy from String Junctions or The Function of Junction Conjunctions	1848
<i>E. Silverstein</i>	
Instantons in Non-Critical Strings from the Two-Matrix Model	1864
<i>V.A. Kazakov and I.K. Kostov</i>	
Fluid Dynamics of NSR Strings	1895
<i>D. Polyakov</i>	

	xiii
Strings, Gauge Fields and Membranes <i>R.J. Szabo</i>	1920
Touring the Hagedorn Ridge <i>J.L.F. Barbon and E. Rabinovici</i>	1973
Black Holes and Thermodynamic States of Matrix Models <i>G.W. Semenoff</i>	2009
Tachyons in String Theory <i>A. Sen</i>	2035
Anomaly Cancellations on Lower-Dimensional Hypersurfaces by Inflow from the Bulk <i>A. Bilal</i>	2051
7. Other Aspects	2093
A Larger than Naive Cut-off in a Simple Model <i>P. Creminelli, H. Georgi and N. Arkani-Hamed</i>	2095
Quartic Anharmonic Many-body Oscillator <i>A. Turbiner</i>	2108
A Super-Flag Landau Model <i>E. Ivanov, L. Mezincescu, and P.K. Townsend</i>	2123
Through the Looking-Glass: Alice's Adventures in Mirror World <i>Z. Berezhiani</i>	2147
Part 3: Selected Papers by Ian Kogan	2197
Once More on Weak Radiative Decays <i>I.I. Kogan and M.A. Shifman</i>	2199
Vortices on the World Sheet of a String: Critical Dynamics <i>I.I. Kogan</i>	2218
Logarithmic Operators and Hidden Continuous Symmetry in Critical Disordered Models <i>J.-S. Caux, I.I. Kogan and A.M. Tsvetlik</i>	2223
Single-Brane Cosmological Solutions with a Stable Compact Extra Dimension <i>P. Kanti, I.I. Kogan, K.A. Olive and M. Pospelov</i>	2246

xiv

Brane Universe and Multigravity: Modification of Gravity at Large and Small Distances	2274
<i>I.I. Kogan and G.G. Ross</i>	
High Energy QCD: Stringy Picture from Hidden Integrability	2286
<i>A. Gorsky, I.I. Kogan and G. Korchemsky</i>	
List of the Publications of Ian Kogan	2335