Contents

Preface	V
Photograph Collection of Akira Tonomura	xi
My Dream of Ultimate Holography Electron Microscope Akira Tonomura	1
Biography of Akira Tonomura (April 1942 – May 2012) Nobuyuki Osakabe	7
Tonomura FIRST International Symposium on "Electron Microscopy and Gauge Fields" Yoshimasa A. Ono	17
Recollections of Akira Tonomura	
Thank You and Farewell to Tonomura-kun Hidetoshi Fukuyama	25
Remembering Akira Tonomura Michael Berry	30
Akira Tonomura: An Experimental Visionary Anton Zeilinger	33
Dr. Akira Tonomura: Master of Experimental Physics Kazuo Fujikawa	36
Gauge Theory and Aharonov-Bohm Effect	
Topology and Gauge Theory in Physics Chen Ning Yang	41

V	1	1	1	

On the Aharonov-Bohm Effect and Why Heisenberg Captures Nonlocality Better Than Schrödinger Yakir Aharonov	50	"The Picture is My Life" Shuji Hasegawa	156
How the Test of Aharonov-Bohm Effect Was Initiated at Hitachi Laboratory	(2)	Direct Observation of Electronically Phase-Separated Charge Density Waves in Lu ₂ Ir ₃ Si ₅ by Transmission Electron Microscopy <i>Cheng-Hsuan Chen</i>	164
Nobuyuki Osakabe Some Reflections Concerning Geometrical Phases	62	Basic Discoveries in Electromagnetic Field Visualization Daisuke Shindo	172
Anthony J. Leggett and Yiruo Lin Mesoscopic Aharonov-Bohm Interferometers: Decoherence and	74	Nanomagnetism Visualized by Electron Holography Hyun Soon Park	180
Thermoelectric Transport Ora Entin-Wohlman, Amnon Aharony, and Yoseph Imry	86		100
Spin Textures and Gauge Fields in Frustrated Magnets		Quantum Physics	
Naoto Nagaosa and Yoshinori Tokura	102	Probing the Proton with Electron Microscopy Jerome I. Friedman	192
Gauge Theory and Artificial Spin Ices: Imaging Emergent Monopoles with Electron Microscopy		Hanbury Brown–Twiss Interferometry with Electrons:	
Shawn D. Pollard and Yimei Zhu	110	Coulomb vs. Quantum Statistics Gordon Baym and Kan Shen	201
Do Dispersionless Forces Exist? Herman Batelaan and Scot McGregor	122	Vortex Molecules in Thin Films of Layered Superconductors Alexander I. Buzdin	211
Aharonov-Bohm Effect and Geometric Phases — Exact and Approximate Topology <i>Kazuo Fujikawa</i>	130	Coherent Quantum Phase Slip Jaw-Shen Tsai	221
A Brief Overview and Topological Aspects of Gaseous Bose-Einstein Condensates		Coherency of Spin Precession in Metallic Lateral Spin Valves YoshiChika Otani, Hiroshi Idzuchi, and Yasuhiro Fukuma	227
Masahito Ueda	136	Transverse Relativistic Effects in Paraxial Wave Interference Konstantin Y. Bliokh, Yana V. Izdebskaya, and Franco Nori	237
Application of Electron Microscopy to Quantum Mechanics and Materials Sciences		Reprints of Akira Tonomura's Most Important Publications	247
Mapping Electric Fields with Inelastic Electrons in a Transmission		Akira Tonomura's Books and Major Publications	305
Electron Microscope Christian Colliex	144	Video Clips of Tonomura's Experiments	313

ix

Contents