Advances in Solid State Physics

Volume 48

Advances in Solid State Physics

Advances in Solid State Physics is a book series with a history of about 50 years. It contains the invited lectures presented at the Spring Meetings of the “Arbeitskreis Festkörperphysik” of the “Deutsche Physikalische Gesellschaft”, held in March of each year. The invited talks are intended to reflect the most recent achievements of researchers working in the field both in Germany and worldwide. Thus the volume of the series represents a continuous documentation of most recent developments in what can be considered as one of the most important and active fields of modern physics. Since the majority of invited talks are usually given by young researchers at the start of their career, the articles can also be considered as indicating important future developments.

The speakers of the invited lectures and of the symposia are asked to contribute to the yearly volumes with the written version of their lecture at the forthcoming Spring Meeting of the Deutsche Physikalische Gesellschaft by the Series Editor. Colored figures are available in the online version for some of the articles.

Advances in Solid State Physics is addressed to all scientists at universities and in industry who wish to obtain an overview and to keep informed on the latest developments in solid state physics. The language of publication is English.

Series Editor

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48

With 182 Figures and 13 Tables

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Preface

The 2008 spring meeting of the *Arbeitskreis Festkörperphysik* was held in Berlin between February 24 and 29, 2008 in conjunction with the 72. Annual Meeting of the *Deutsche Physikalische Gesellschaft*. It was the last spring meeting of the *Arbeitskreis Festkörperphysik* because in the meantime it changed its name to *Sektion kondensierte Materie* which better shows that it also includes soft materials and biological systems. Therefore, the next spring meeting in Dresden will be organized by the *Sektion kondensierte Materie* of the *Deutsche Physikalische Gesellschaft*. The number of participants of this year's meeting in Berlin exceeded 5600 and there were more than 4600 scientific contributions. With these numbers this meeting was the largest physics meeting in Europe and among the largest physics meetings in the world in 2008.

The present volume, 48 of the *Advances in Solid State Physics* contains the written version of a large number of the invited talks in Berlin and gives a nice overview of the present status of condensed matter physics. Low-dimensional systems are dominating the field and especially nanowires and quantum dots. In recent years one learned how to produce nanowires directly during a growth process. Therefore, a number of articles is related to such nanowires. In nanoparticles and quantum dots the dimensionality is further reduced and we learn more and more how to produce such systems and what effects result from the confinement in all three dimensions. Spin effects and magnetism is another important field of present day research in solid state physics. The third chapter covers this physics including an article about *graphene*. The growing interest into organic materials and biological systems is reflected in a large chapter of this book with the title *Organic Materials and Water*. The last chapters of this book cover aspects which range from dynamical effects to device physics and characterization tools.

Contents

Part I Nanowires

From Ordered Arrays of Nanowires to Controlled Solid State Reactions

<i>Margit Zacharias and Hong Jin Fan</i>	3
1 Introduction	3
2 Methods for nano-patterning	6
3 Selected results – stimulated emission	7
4 Nanotubes based on Kirkendall diffusion and solid state reactions . .	8
5 Summary	11
6 Acknowledgement	12
References	12

Growth Methods and Properties of High Purity III-V Nanowires by Molecular Beam Epitaxy

<i>D. Spirkoska, C. Colombo, M. Heiß, M. Heigoldt, G. Abstreiter, and A. Fontcuberta i Morral</i>	13
1 Introduction	13
2 Experimental	14
3 Selective area epitaxy	14
4 Conditions leading to group III assisted growth of nanowires	17
5 Structural and optical properties	19
6 Potential for future structures and devices	21
7 Conclusions	23
8 Acknowledgements	23
References	23

Simple Ways to Complex Nanowires and Their Application

<i>Mady Elbahri, Seid Jebril, Sebastian Wille, and Rainer Adelung</i>	27
1 Introduction	27
2 Experimental	28

3	Results and discussion	31
4	Conclusion	35
5	Acknowledgement	37
	References	37

ZnO Nanostructures: Optical Resonators and Lasing

*Klaus Thonke, Anton Reiser, Martin Schirra, Martin Feneberg,
Günther M. Prinz, Tobias Röder, Rolf Sauer, Johannes Fallert,
Felix Stelzl, Heinz Kalt, Stefan Gsell, Matthias Schreck, and*

	<i>Bernd Stritzker</i>	39
1	Introduction	39
2	Lasing in nanostructures	40
3	Single ZnO pillars as nano-resonators	44
4	Laser-activity of single ZnO pillars	51
5	Summary and outlook	54
6	Acknowledgements	55
	References	55

Waveguiding and Optical Coupling in ZnO Nanowires and Tapered Silica Fibers

	<i>Tobias Voss</i>	57
1	Introduction	57
2	Experiment	58
3	Results and discussion	58
4	Conclusions	63
5	Acknowledgements	63
	References	64

Part II Quantum Dots and Nanoparticles

Electrically Driven Single Quantum Dot Emitter Operating at Room Temperature

*Tilmar Kimmell, Robert Arians, Arne Gust, Carsten Kruse, Sergey
Zaitsev, Detlef Hommel, and Gerd Bacher*

	<i>Zaitsev, Detlef Hommel, and Gerd Bacher</i>	67
1	Introduction	67
2	Quantum dots optimized for RT emission	68
3	Electrically driven single quantum dot emitter	73
4	Summary	76
5	Acknowledgements	77
	References	77

Silicon Nanoparticles: Excitonic Fine Structure and Oscillator Strength

<i>Cedrik Meier, Stephan Lüttjohann, Matthias Offer, Hartmut Wiggers, and Axel Lorke</i>	79
1 Introduction	79
2 Experimental details	80
3 Results and discussion	80
4 Conclusion	89
5 Acknowledgments	89
References	89

Intrinsic Non-Exponential Decay of Time-Resolved Photoluminescence from Semiconductor Quantum Dots

<i>Jan Wiersig, Christopher Gies, Norman Baer, and Frank Jahnke</i>	91
1 Introduction	91
2 Time-resolved photoluminescence	92
3 Correlations	95
4 Cluster expansion method	96
5 Numerical results: non-exponential PL decay	97
6 Numerical results: excitation-intensity dependence	99
7 Conclusion	99
8 Acknowledgments	101
References	101

Electrical Spin Injection into Single InGaAs Quantum Dots

<i>Michael Hetterich, Wolfgang Löffler, Pablo Aßhoff, Thorsten Passow, Dimitri Litvinov, Dagmar Gerthsen, and Heinz Kalt</i>	103
1 Introduction	103
2 Initialization and readout of spins in single dots	105
3 Spin loss mechanisms and device optimization	107
4 Time-resolved measurements	112
5 Conclusions	112
6 Acknowledgements	113
References	113

Part III Spin and Magnetism

Spintronic and Electro-Mechanical Effects in Single-Molecule Transistors

<i>Maarten R. Wegewijs, Felix Reckermann, Martin Leijnse, and Herbert Schoeller</i>	117
1 Introduction	117
2 Mixed-valence dimer transistor	119
3 Transport spectroscopy	122
4 Acknowledgement	128
References	128

Transport in 2DEGs and Graphene: Electron Spin vs. Sublattice Spin

<i>Maxim Trushin and John Schliemann</i>	129
1 Introduction	129
2 Derivation of the kinetic equation	130
3 2DEG with spin-orbit coupling	131
4 Transport in graphene	136
5 Conclusion remarks	139
References	140

Spin Dynamics in High-Mobility Two-Dimensional Electron Systems

<i>Tobias Korn, Dominik Stich, Robert Schulz, Dieter Schuh, Werner Wegscheider, and Christian Schüller</i>	143
1 Introduction	143
2 Theory	144
3 Sample structure and preparation	147
4 Measurement techniques	147
5 Experimental results	148
6 Summary	154
7 Acknowledgements	154
References	154

Magnetization Dynamics of Coupled Ferromagnetic-Antiferromagnetic Thin Films

<i>Jeffrey McCord</i>	157
1 Introduction	157
2 Magnetization dynamics	158
3 Statics and dynamics of exchange biased F/AF films	160
4 F/AF/F structures below the onset of exchange bias	163
5 Conclusions	168
6 Acknowledgements	168
References	168

Magnetic and Electronic Properties of Heusler Alloy Films Investigated by X-Ray Magnetic Circular Dichroism

<i>Hans-Joachim Elmers, Andres Conca, Tobias Eichhorn, Andrei Gloskovskii, Kerstin Hild, Gerhard Jakob, Martin Jourdan, and Michael Kallmayer</i>	171
1 Introduction	172
2 Experimental	173
3 Martensitic phase transition in Ni_2MnGa films	173
4 Interface properties of Heusler compound films	177
5 Summary	181
6 Acknowledgements	181
References	181

Coherent Spin Dynamics in Nanostructured Semiconductor-Ferromagnet Hybrids

<i>Patric Hohage, Jörg Nannen, Simon Halm, and Gerd Bacher</i>	183
1 Introduction	183
2 Samples and experiment	184
3 Free vs. localized spin precession in a semiconductor	185
4 Spin dynamics in ferromagnet-semiconductor hybrids	187
5 Summary	193
6 Acknowledgements	194
References	194

Part IV Organic Materials and Water

Coupling of Paramagnetic Biomolecules to Ferromagnetic Surfaces

<i>Heiko Wende</i>	199
1 Introduction	199
2 Experimental details	200
3 Results and discussion	200
4 Summary	205
5 Acknowledgements	206
References	206

Band Alignment in Organic Materials

<i>F. Flores, J. Ortega¹ and H. Vázquez</i>	207
1 Introduction	207
2 The CNL in the IDIS model	210
3 The IDIS model at MO interfaces	212
4 IDIS model for OO interfaces	214
5 Results and discussion	214
6 Conclusions	217
7 Acknowledgements	217
References	217

Organometallic Nanojunctions Probed by Different Chemistries: Thermo-, Photo-, and Mechano-Chemistry

<i>Martin Konôpka, Robert Turanský, Nikos L. Doltsinis, Dominik Marx, and Ivan Štich</i>	219
1 Introduction	219
2 Thermo- and Mechano-chemistry of copper-ethylthiolate junctions ..	220
3 Mechanically and opto-mechanically controlled azobenzene (AB) switch based on AB-gold break-junction.	225
4 Conclusions	231
5 Acknowledgements	232
References	233

When It Helps to Be Purely Hamiltonian: Acceleration of Rare Events and Enhanced Escape Dynamics

Dirk Hennig, Simon Fugmann, Lutz Schimansky-Geier, and

<i>Peter Hänggi</i>	237
1 Introduction	237
2 The oscillator chain model	239
3 Spontaneous energy localization	239
4 Escape dynamics	242
5 Conclusions	246
6 Acknowledgments	247
References	247

Liquid Polyamorphism and the Anomalous Behavior of Water

H. E. Stanley, S. V. Buldyrev, S.-H. Chen, G. Franzese, S. Han,

<i>P. Kumar, F. Mallamace, M. G. Mazza, L. Xu, and Z. Yan</i>	249
1 Background	250
2 Understanding “static heterogeneities”	252
3 Understanding “dynamic heterogeneities”	257
4 Hamiltonian model of water	260
5 Outlook	261
References	262

Part V Dynamical Effects, Rectification and Nonlinearities

Terahertz Detection of Many-Body Signatures in Semiconductor Heterostructures

Sangam Chatterjee, Torben Grunwald, Stephan W. Koch, Galina

<i>Khitrova, Hyatt M. Gibbs, and Rudolf Hey</i>	269
1 Introduction	269
2 Experimental detail	270
3 Data analysis	272
4 Intra-excitonic 1s-2p transition in GaAs/(AlGa)As quantum wells ..	274
5 Intra-excitonic 1s-2p transition in (GaIn)As/GaAs quantum wells ..	276
6 Acknowledgements	278
References	278

Theory of Ultrafast Dynamics of Electron-Phonon Interactions in Two Dimensional Electron Gases: Semiconductor Quantum Wells, Surfaces and Graphene

Marten Richter, Stefan Butscher, Norbert Bücking, Frank Milde,

<i>Carsten Weber, Peter Kratzer, Matthias Scheffler, and Andreas Knorr</i> ..	281
1 Introduction	281
2 Theoretical framework	282
3 Phonon-induced relaxation dynamics at the silicon (001) 2×1 surface	284

4	Scattering response and spatiotemporal wavepackets in quantum cascade lasers	286
5	Non-equilibrium phonon dynamics in graphene	287
6	Terahertz light emission	288
7	Summary	290
8	Acknowledgement	290
	References	290

**Optical Microcavities as Quantum-Chaotic Model Systems:
Openness Makes the Difference!**

	<i>Martina Hentschel</i>	293
1	Introduction	293
2	Deviations from ray-wave correspondence	297
3	Correcting ray optics by wave effects: Goos-Hänchen shift and Fresnel filtering	300
4	Outlook: non-Hamiltonian dynamics in quantum-chaotic model systems	303
5	Acknowledgements	304
	References	304

**Nonlinear Transport Properties of Electron Y-Branch
Switches**

	<i>Lukas Worschech, David Hartmann, Stefan Lang, D. Spanheimer, Christian R. Müller, and Alfred Forchel</i>	305
1	Introduction	305
2	Fabrication techniques	306
3	Quantum capacitance and self-gating	307
4	Self-gating in a Y-branch switch at room temperature	308
5	The Y-branch as logic device	312
6	Acknowledgements	315
	References	315

Rectification through Entropic Barriers

	<i>Gerhard Schmid, P. Sekhar Burada, Peter Talkner, and Peter Hänggi</i> ..	317
1	Introduction	317
2	Diffusion in confined systems	319
3	Transport in periodic channels with broken symmetry	320
4	Conclusions	325
5	Acknowledgements	326
	References	326

Part VI Characterization of Materials and Devices

Microstructure Tomography – An Essential Tool to Understand 3D Microstructures and Degradation Effects

Alexandra Velichko and Frank Mücklich 331

1 Introduction 331

2 Basic characteristics of the microstructure 332

3 Determination of the 3D grain size distribution from 2D micrographs 333

4 Analysis of the 3D tomographical images 335

5 Conclusions 341

References 342

Profiling of Fiber Texture Gradients by Anomalous X-ray Diffraction

M. Birkholz, N. Darowski and I. Zizak 343

1 Why are texture profiles of interest? 343

2 Conceptual approach 346

3 Experiments and results 348

4 Conclusions 350

5 Acknowledgements 351

References 351

Film Production Methods in Precision Optics

Hans K. Pulker 353

1 Introduction 353

2 PVD-methods 354

3 Thin film properties 364

4 Conclusions 368

References 369

Advanced Metrology for Next Generation Transistors

Alain C. Diebold 371

1 Introduction 371

2 Optical models for high K 372

3 Optical model for metal films 377

4 Charge pumping based capacitance – voltage measurements 377

5 Optical measurement of charge trapped in high k and interface 378

6 Measurement of ultra-thin SOI and observation of quantum confinement 380

7 Conclusions 381

8 Acknowledgements 381

References 381

Index 385