## **Table of Contents**

Preface

Opening Address	3
Remote Plasma-Enhanced Chemical Vapor Deposition of Homoepitaxial Silicon AT 150C S. Banerjee, A. Tasch, B. Anthony, T. Hsu, L. Breaux and R. Qian	7
Strained Layer Epitaxy for Material Quality Improvement H. Beneking	21
<b>Growth Instabilities in LPE Processes: The Initial Steps of Heteroepitaxy</b> Y.B. Bolkhovityanov	37
<b>Epitaxial Heterostructures of Semiconductor Multicomponent Solid Solutions</b> L.M. Dolginov and M.G. Mil'vidskii	54
MOVPE of GaInAs/AlGaInAs Heterostructures and Quantum Wells for Optoelectronic	
Devices M. Druminski	71
Impurity Diffusion in InGaAs-InP Heterojunction Bipolar Transistors Grown by MOCVD R.D. Dupuis, N.D. Gerrard, C.J. Pinzone, N.T. Ha, H.S. Luftman and C.M. Cotell	73
On the Pecularities of the Short-Time (T <sub>g</sub> D.Z. Garbuzov, E.V. Zhuravkevich, A.I. Zhmakin, Y. Makarov and A.V. Ovchinnikov	75
Interfacial Ordering in Si/Ge Strained-Layer Superlattices E. Müller, H.U. Nissen, M. Ospelt and H. von Känel	85
<b>Epitaxial Lateral Overgrowth of III-V Compounds for Obtaining Dislocation Free Layers</b> T. Nishinaga	92
Growth of GaAs on Si: A Solution for the Site Allocation Problem M. Pessa, H. Asonen and J. Varrio	100
Fabrication of Custom-Designed Semiconductor Microstructures by Molecular Beam Epitaxy	111
High Resolution X-Ray Diffraction Analysis of Epitaxial Structures T.W. Ryan and S. Bates	124
Substrates for Oxide Superconductors: Present Status and Future Needs H.J. Scheel	134
Thin Films of YBaCuO, BiSrCaCuO and TiBaCaCuO Deposited by Chemical Methods M. Schieber	135
HTSC Thin Films Growth: From MBE to Atomic Layer Epitaxy A. Schuhl, R. Cabanel, B. Ghyselen, J.P. Hirtz and G. Creuzet	152
Controlling the Physical Properties of Epitaxy Semiconductor Films by Isovalent Impurity	
<b>Doping</b> Y.V. Shmartsev	156
Problems of Growth and Defect Formation During MBE of Modulated Structures Based on Elemental and III-V Compound Semiconductors	
S.I. Stenin	175
Kinetics of MBE-A Theoretical Approach and Confrontation with the Experiment S. Stoyanov	197
Mechanistic Study of Organometallic Vapor Phase Epitaxy G.B. Stringfellow	207
Recent Progress in Chemical Beam Epitaxy W.T. Tsang	230
Morphological Instability During MBE and VPE A. Zangwill	233
<b>Process Conditions for Uniform Selective Epitaxial Growth</b>	236
Surface Structure Analysis during Silicon Growth on Si(111)7x7	239
Role of Interface for Solid Phase Epitaxial Growth of Amorphous Silicon Film Deposited on Reconstructed Surface of Silicon (111)	245
Solid Phase Epitaxial Growth of Amorphous Silicon Induced by X-Ray Irradiation Using Synchrotron Radiation	251

Applications of Silicon LPCVD-Epilayers	257
Initial Stages of Epitaxial Growth of Si, Ge and Au on Si(111) Studied by In Situ UHV REM	263
Properties of Sb Delta-Layers Obtained by Si-MBE	266
New Possibilities of the Si Condensation in Vacuum	271
Numerical Calculation of Thermal Processes in Laser Processing of Semiconductor Materials	281
A Model of Dopant Redistribution under Laser Recrystallization	287
Autodoping Effects during Thin Epitaxial Layeas Growth on Heavy Doped Substrates in a Conventional Reactor	292
Structure of Epitaxial Interfaces with Real Interatomic Forces	298
Theoretical Physical-Chemical Analysis of the Epitaxial Deposition of Silicon Layers from Silicon-Containing Components Mixture	306
Heteroepitaxial Growth of Silicon on YTTRIA Stabilized Zirconia (YSZ) and Oxidation of the Si-YSZ Interface	310
Laser-Induced Epitaxial Growth of Silicon Layers on Insulating Substrates	315
Microelectronic Structures in Laser-Induced Epitaxial Silicon Layeas on Insulator	321
Thin Epitaxial Layer Growth in a "Pancake" Reactor with SiCl <sub>4</sub> , SiH <sub>2</sub> Cl <sub>2</sub> and SiH <sub>4</sub>	325
Silicon Liquid Phase Lateral Epitaxy and Stresses in SOI Structure with Seeding Window by Pulse Heating	331
Ion-Molecular Beam Heteroepitaxy of the Silicon on Sapphire: Initial Growth Stages	336
Germanium-Silicon Strained-Layer Superlattices	341
Heteroepitaxy of Ge at Weak Interaction with Substrate	343
Migrational Coalescence under Electron Irradiation of Discontinuous Germanium Films on KCI (100)	346
Epitaxial Growth of KTa <sub>1-X</sub> Nb <sub>x</sub> O <sub>3</sub> on Cubic KTaO <sub>3</sub>	349
LPE of Highly Bi-Substituted Garnets for Magnetoopics	355
Electron Microscopy of YBa <sub>2</sub> Cu <sub>3</sub> O <sub>7-δ</sub> Films	361
On Epitaxial Growth Centre of LiNb <sub>3</sub> O <sub>8</sub> on (0001) Surface of LiNbO <sub>3</sub>	364
Study on Flux LPE KTP Film	367
Influence of Deposition Parameter on the Properties of Epitaxial Silicon-Carbide Films	373
Influence of Deposition Parameter on the Properties of Epitaxial Silicon-Carbide Films	375
Strain Effects in Epitaxial Layers on Si-Substrates	380
Growth and Properties of Single Crystalline GaN Films by Hydride Vapor Phase Epitaxy	386
<b>Epitaxial Growth of Aluminum Nitride on Different Substrates</b>	390
<b>Epitaxy and Growth Mechanisms in Metallic Multilayers</b>	397
Heteroepitaxial Growth of $CoSi_2/Si$ Multilayers and Buried $Co_xNi_{1-x}Si_2$ Layeas by Ion Beam Synthesis	401
Crystal Growth Phenomena during the Epitaxial Formation of NiSi <sub>2</sub> Islands on Si(111)	411
MBE of TiSi <sub>2</sub> on (111) Si	417
Production of Highly Pure Articles for MBE and CBE of A <sup>3</sup> B <sup>5</sup> and CaF <sub>2</sub>	419
Effect of Mechanical Stress on Magnetic Parameters of Epitaxial Garnets	420
Thickness Dependence of Magnetic Parametes in Epitaxial Garnets	426
In Situ Monitoring of Step Arrays on Vicinal Silicon (100) Surfaces for Heteroepitaxy	432
Influence of GaAs Buffer Layer Growth and Annealing Conditions on the Quality of Gaas/AlAs Superlattices Grown on (100) Si by Molecular Beam Epitaxy	438
Antiphase Domain Studies in GaAs Layeas	444
Peculiarities of Epitaxial Growth of GaAs and GaP on Si and Ge from Liquid Phase	449
Epitaxial Growth of GaAs on Si by MBE	455
Heteroepitaxial Growth of GaP on Si-Substrates	459
Heteroepitaxial IV-Vi and II-VI Compound Semiconductors on Silicon with Intermediate IIA-Fluoride Buffers: Properties and Applications	462
Interface Structure of CaF <sub>2</sub> /GaAs Epitaxial System	467

Liquid-Phase Epitaxy of Si-Si <sub>1-X</sub> , Si-St <sub>1-X</sub> Ge <sub>x</sub> -GaAs (0	470
Epitaxial Growth of Silicon Carbide on Silicon Substrates	475
Testing of GaAs:Si Layers and Substrates by the Pointcontact Voltage Measurement	483
Molecular-Beam Epitaxial Growth of Aluminium and Copper Films on a Silicon Substrate as Electromigration Probe Structures	488
Molecular-Beam Epitaxial Growth of Aluminium Films on Silicon Substrates	489
Critical Thickness Determination of (001) CdTe/Cd <sub>x</sub> Zn <sub>1-X</sub> Te Heterostructures Grown by Molecular Beam Epitaxy on (001) GaAs	492
The Investigation of the Epitaxial Growth of CdTe(001) on GaAs(001) by RHEED	497
Experimental Test of a Theoretical Model for Atomic Layer Epitaxy of CdTe	502
Characterization of MBE Grown ZnSe Epilayers Doped with Arsenic	508
Growth and Properties of ZnS Epitaxial Layers on Yttrium - Aluminium Granates	514
Si, Ge-ZnSe, CdSe Heterostructures Epitaxialy Grown by HWT and their Properties	520
Behaviour of Impurities in (Hg,Cd)Te Layers Grown by LPE	526
The Epitaxial Layer Growth Investigation in Cd <sub>x</sub> Hg <sub>1-x</sub> Te-NH <sub>4</sub> Cl(Br,J) Systems	530
Near-Surface Transition Layer in MBE of PbTe: A Thermodynamic Analysis	533
On the Existence of a Pseudomorphic Layer in Epitaxial TiBiSe <sub>2</sub> Thin Films	539
The Pecularities of Crystallization of PbTe - Layers	545
Influence of Mass Transfer Velocity on Layer Parameters in Cd <sub>x</sub> Hg <sub>1-X</sub> Te-Nh <sub>4</sub> Cl(Br,J) Systems	551
Atomic Layer Epitaxy Versus Phase-Locked Epitaxy, Migration Enhanced Epitaxy and Molecular Layer Epitaxy: A Critical Comparison	554
Computer Simulation of Rheed Intensity Oscillation by Poly-Nuclear Growth Model	560
Analysis of the Mechanism of Epitaxial Growth from Rheed Intensity Oscillations	563
Arsenic-Gallium Flux Ratio Dependence of Rheed Intensity Oscillations during MBE Growth on Vicinal GaAs(001) Surfaces	564
Growth Oscillations in VCE Detected by Reflectance	570
Nondestructive Methods to Control In Situ Characteristics of Thin Films during MBE	575
Getter Epitaxy of the Thin Film Structures and their Optical Properties at the Conditions of Nonequilibrium Electron-Hole Plasma Excitation	580
Investigation of InAs Layers Grown by MBE on (100)Inp Substrates	582
Ultra-High Purity Arsenic for MBE	583
Characterization of Crystal Perfection of III-V Compound Epitaxial Layers	590
Application of Reflection Mass-Spectrometry for In Situ Growth Control in MBE	595
Deep-Level Defects in MBE-Grown AlGaAs Structures	596
UV Photolysis of Transition-Metal Carbonyls and Thin Metal Films Formation	602
Interface Symmetry and Crystallochemical Regularities of Heteroepitaxy	604
The Effect of Endotaxy on Lamellar Eutectoid Growth	610
The Growth of Large-Area Heterostructures for Optoelectronic Applications by Atmospheric Pressure and Low Pressure Metalorganic Vapour Phase Epitaxy	615
Stability Analysis for III-V Reciprocal Quaternary Solid Solutions	616
LPE of Semiconductors under γ-Radiation	618
Application of EF-LCP Method to the Calculation of Epitaxial Crystal Growth Processes in A <sup>3</sup> B <sup>5</sup> Semiconductor Systems: In-Ga-As-Sb, In-As-Sb-P, Al-Ga-As-Sb	619
The Influence of Solutal Convection on the Transport Phenomena during LPE Growth from Multicomponent Solutions	624
Superhigh Cooling Rates in LPE	629
Conformal Vapour Phase Growth of Semiconductor Materials	635
Analysis of Equilibrium Characteristics of Ga-H-Cl Systems	641
651	651
Close-Spaced Vapor Transport Epitaxy of GaAs	656

Planar and Selective Regrowth of Semi-Insulating InP:Fe by Hydride VPE in Nitrogen Ambient	661
Dependence of the Defect Structure of $\text{In}_x\text{Ga}_{1\text{-}x}\text{As}/\text{InP}$ Epilayers on the In/Ga Ratio in the Vapour Phase	666
On the Origin of the Mobility Lowering in Epitaxial GaAs	672
Modeling of the Vapour Phase Epitaxial Growth of $Ga_x In_{1-X}As$ from a Ga-In-As-H-Cl System	679
Kinetics Study of Chemical Reactions in the VPE InGaAsP System by Optical Spectroscopy Techniques	682
The Mechanism of the "Out-Diffusion" during VPE Growth of GaAs	685
Some Remarks on the Studies of the (Homogeneous) Growth of GaAs VPE Layers	691
Electron States in the Superlattice Structures on the Base of Multinary Semiconductor Compound Alloys	697
Bragg Confinement of Carriers in a Quantum Barrier	701
Germanium-Silicon Strained-Layer Superlattices	704
Electrical and Optical Properties of Delta-Doped MBE-Grown Superlattices	707
Metalorganic Vapor Phase Epitaxial Growth and Annealing Experiments of InP Doping Superlattices	710
LPE Structures AllnAs-InGaAs with 2DEG	713
Investigation of Transition Layer between InP-InGaAs Epilayers in Modulation-Doped Heterostructures	715
Gas Source Molecular Beam Epitaxy Growth of High Optical Quality GalnP and GalnP/AllnP Multiple Quantum Wells	717
Observation of Photoluminescence of Type II Quantum Wells of InP/GaAs/InP Grown by MOCVD	724
A New Rotational Vertical LPE System for GaAs-AlGaAs Superlattice Production	727
Liquid Phase Epitaxial Growth of GaAs/GaAlAs Multiquantum-Well Dislocation Barriers	729
GaAs/GaAsP Superlattices Grown by the Chloride VPE Using a Single Flat Temperature Zone	735
Movpe Reactor with Flow Mixer for Sharp GaAs/GaAlAs Interfaces with Uniform Layer Thicknesses	740
Improved Deposition Uniformity in the Inverted MOCVD Reactor Geometry	746
Growth of GaP Doping Superlattices by Isothermal Vapor Phase Epitaxy	752
Metalorganic Vapour Phase Epitaxy of GaAs Layers for Electronic Devices	758
Investigation of the Effect of Various Factors upon the Lattice Period in Homoepitaxial GaAs Layers	763
Liquid Phase Epitaxy of GaAs from a Bismuth Melt	769
High Purity p-GaAs Grown from the Bi Melt Doped by Yb	774
Gallium Arsenide Refining with Bismuth	777
Deep Levels in Undoped GaAs Grown by LPE	778
Experimental Comparison of Low Frequency Noise Generated in Different GaAs Epitaxial Layers	781
The Epitaxial Layer Homogeneity Investigation by the Parameter Mapping Method	787
Relaxation Liquid Phase Epitaxy under Conditions of Inversed Mass Transfer and its Possibilities in Growing Thin Layers of III-V Compounds	794
The Problems of Homogeneity of GaAs/AiGaAs Heterostructures Grown by MOVPE	799
Liquid Phase Epitaxy of Graded-Hetero GaAs <sub>1-X</sub> P <sub>x</sub> /GaP Structures	805
Multilayers as Defect Barriers	808
Preparation of High Quality Abrupt GaAs/GaAiAs Heterojunctions by Advanced Liquid Phase Epitaxy	814
The Peculiarities of the Al-Ga-Bi-As System in Connection with LPE of Al <sub>x</sub> Ga <sub>1-x</sub> As on GaAs Substrates	823
Separated Growth of Monocrystalline Films in the System Sn-Ga-Al-As	826
Epitaxy of GaAs and Al <sub>x</sub> Ga <sub>1-x</sub> As in Ga-In and Bl-Ga Solvents - A Perspective of LPE	832

Growth and Properties of the n-Type ln <sub>0.53</sub> Ga <sub>0.47</sub> As LPE Layers Using Rare-Earth Element	0.20
Oxide	839
Flat Layers by LPE on Structured Substrates	845
Growth and Characterization of 2" LnP Single Crystals	850
Defects in LnP (100)	851
Lattice Mismatched MOVPE Growth of lnP and GaAs on Masked Substrates	856
Controlled Epitaxial Growth of GalnAsP/InP from the Liquid Phase	862
Thin InGaAsP-Layers by LPE-Step Cooling Techniques	867
Investigation of Mismatch Behaviour between Epitaxial Layer and the Substrate in LPE LnGaAsP:lnP System	872
Features of Liquid Phase Epitaxy and Electrical Properties of In <sub>0.53</sub> Ga <sub>0.47</sub> As:Sb Epitaxial Layers	881
IPE InP-InGaAs Structures with 2DEG Mobilities up to 10 <sup>5</sup> cm <sup>2</sup> /Vs	889
Epitaxial Growth of lnGaAsSb and AlGaAsSb from Sb-Enriched Solutions	891
The Dependence of Surface Morphology on Lattice Mismatch in LPE Growth of lnAsPSb on lnAs	896
Concentration Measurements near Homo and Heterojunctions in Electrochemical Profiling, Model Calculation	901
Detection of Hydrogen, Carbon and Oxygen in GaAs Epitaxial Layeas by Sims	907
Silicon Planar Epitaxial Pressure Sensors	913
Narrow Mesa Substrate Inner Stripe Laser	917
Growth Mechanism of InGaAsP/LnP Laser Heterostructures Prepared by LPE	923
Localized Dry Etching and Epitaxial Regrowth of Multilayer Heterostructures on lnP for Optoelectronics and Quantum Devices	929
A Proposal for an Improved SCH-QW Laser Using Short Period Strained-Layer Superlattice as Active Layer	935
Defect Formation and Photoelectric Devices of Ga-As-Sb Grown by LPE	941
GaxAl1.xAs/GaAs Heterostructures for Heterojunction Bipolar Transistors (HBT) by MOCVD	943
Performance of AiGaAs/GaAs Heterostructure Bipolar Transistors Made with Metalorganic Vapor Phase Epitaxy	945
The Planar Doped Barrier Diodes	950
12 GHz GaAs on Si Power MESFETs	955
In Disproportionation in Aqueous Solution as a Method of Indium Film Growth	961
Enitaxial Growth Mechanism and Structure of Organic Thin Films	963