

# Table of Contents

## Preface

### The Generalisation of Orthodox Crystallography

A.L. Mackay 1

### The Structure of Quasicrystals

W. Steurer 15

### Physical Properties of Quasicrystals - An Experimental Review

S. Takeuchi 35

### Crystallography of Fullerites and Related Graphene Textures

J. Van Landuyt, G. Van Tendeloo, S. Amelinckx, X.F. Zhang, X.B. Zhang and W. Luyten 53

### Connection between Fibonacci-Chains and Average Structure of Faulted ZnS Polytypes

M. Farkas-Jahnke 65

### Incommensurate Modulated Structure Determination by Combining High Resolution Electron Microscopy and Electron Diffraction

Z.Q. Fu, D.X. Huang, F.H. Li, J.Q. Li, Z.X. Zhao, T.Z. Cheng and H.F. Fan 77

### A TEM and X-Ray Diffraction Study of some Imperfectly Ordered, "Infinitely Adaptive" Crystal Structures and the Principles Underlying their Structural Flexibility

R.L. Withers, T.R. Welberry and S. Schmid 85

### Multiple Twinning of Fe<sub>4</sub>Al<sub>13</sub> Showing Pentagonal Pseudosymmetry

M. Ellner and U. Burkhardt 97

### Phase Transformations in Sigma Phases by Mechanical Milling

H. Yang and H. Bakker 109

### Mechanically Induced Atomic Disorder in B8-Structure Intermetallics

G.F. Zhou and H. Bakker 119

### Different Stages of Structure from Regular to Quasicrystalline in Bi-Mn Double Layer Thin Films

K. Yoshida 129

### Modulated Quasicrystals

T. Janssen 139

### Closeness Condition and Acceptance Domains in Chemically Ordered Quasilattices

R. Lück 145

### Atomic Surface Wobbling in Decagonal Quasi-Crystals

K. Niizeki 155

### Pseudo-Octagonal Quasilattice II

Y. Watanabe 167

### A 3D Quasiperiodic Tiling by Projection from 10D Space

T. Soma and Y. Watanabe 175

### A Polymorphism and its Statistics in Fibonacci Lattice

M. Goda and H. Kubo 179

### Structural Relationships between Crystalline Approximant Phases and the Decagonal Mn-Al Phase

C.B. Shoemaker 191

### Dodecahedral Local Ordering in Quasicrystals and in Approximants

V.E. Dmitrienko 199

### An Ideal Structure of Icosahedral Al-Pd-Mn Quasicrystals

A. Yamamoto, A. Sato, K. Kato, A.P. Tsai and T. Masumoto 211

### Superlattice Structure in Al-Ni-Co Decagonal Quasicrystal

K. Edagawa, H. Sawa, M. Ichihara, K. Suzuki and S. Takeuchi 223

### Cluster Description of the Al-Mn Decagonal Phase and Related Crystalline Approximants

J.J. Hu and P.L. Ryder 235

### A HREM Study of the 1/1,2/1 and 2/1,1/1 Orthorhombic Approximants in an AlCoNiTb Alloy

K.H. Kuo, R.C. Yu, X.Z. Li and Z. Zhang 247

<b>Convergent-Beam Electron Diffraction and Electron Microscope Studies on Decagonal Quasicrystals of Al-Ni-Fe and Al-Cu-Co Alloys</b>	255
K. Tsuda, M. Saito, K. Saitoh, M. Terauchi, M. Tanaka, A.P. Tsai, A. Inoue and T. Masumoto	
<b>Decagonal Quasicrystalline and Microcrystalline Structures: Al-Cu-Co (-Si)</b>	267
M. Fettweis, P. Launois, F. Dénoyer and M. Lambert	
<b>Glass to Icosahedral Glass: Transitions in Structure and Physical Properties</b>	275
A.P. Tsai, A. Inoue and T. Masumoto	
<b>Model Structures of Decagonal Quasicrystals and Comparison with Experiments</b>	287
T. Tei-Ohkawa, K. Edagawa and S. Takeuchi	
<b>Stability Calculation of Icosahedral Quasicrystalline Structure and New Type of Approximant Phase in Semiconducting Boron-Rich Solids</b>	297
M. Takeda, K. Kimura, A. Hori, H. Yamashita and H. Ino	
<b>Growth of Al-Cu-Co-Ge Single Quasicrystal by Directional Solidification</b>	307
L.F. Chen, X.X. Chen, W. Liu and F.H. Li	
<b>Dislocations and Plasticity of Quasicrystals</b>	315
K. Urban and M. Wollgarten	
<b>Convergent-Beam Electron Diffraction Determination of the Burgers Vectors of Dislocations in Quasicrystals</b>	323
R. Wang, J. Feng, Y. Yan and M. Dai	
<b>Determination of Burgers Vectors of Dislocations in Decagonal Quasicrystals by HREM and CBED</b>	335
Z. Zhang, Y.F. Yan, H. Zhang and R. Wang	
<b>Linear Elasticity Theory of Quasicrystals and Defects in Quasicrystals</b>	345
D. Ding, W. Yang, C. Hu and R. Wang	
<b>Growth-Induced Phason Disorder in Quasicrystals</b>	355
Y. Ishii	
<b>Ammann Line Jags and Phasons in an Octagonal Quasicrystal</b>	367
J.C. Jiang and K.H. Kuo	
<b>Phason Elasticity and Ising Models</b>	375
T. Dotera	
<b>Electronic Structure and Electron Transport in Quasicrystals</b>	387
T. Fujiwara, G. Trambly de Laissardière and S. Yamamoto	
<b>Al 3P Partial Densities of States in Crystals and Quasicrystals versus Topological Arrangement</b>	395
E. Belin, Z. Dankhazi, D. Mayou and G. Trambly de Laissardière	
<b>Hume-Rothery Phases with Constant e/a Value and their Related Electronic Properties in Al-Cu-Fe(-Cr) Quasicrystalline Systems</b>	403
C. Dong, A. Perrot, J.M. Dubois and E. Belin	
<b>Electronic Structure in Approximants of Stable Quasicrystals</b>	417
G. Trambly de Laissardière and T. Fujiwara	
<b>Band Structure of Aperiodic Systems</b>	427
X.H. Yan, J.R. Yan and Y.P. Mei	
<b>Electronic Density of States for Penrose Tilings and Vicsek Fractal</b>	435
J.Q. You, F. Nori and C.-. Lam	
<b>Transport Properties of the Decagonal Single Quasicrystals</b>	445
D.L. Zhang and Y.P. Wang	
<b>Electronic Transport of 2-D Penrose Lattice with Random Phason Strain</b>	457
S. Yamamoto and T. Fujiwara	
<b>Formation of Al-Pd-Re Icosahedral Quasicrystals and their Electrical Properties</b>	465
Y. Honda, K. Edagawa, A. Yoshioka, H. Akiyama, T. Hashimoto and S. Takeuchi	
<b>Third Sound of Superfluid <math>^4\text{He}</math> Films in the Penrose Lattice</b>	473
K. Kono, T. Komuro and K. Shirahama	
<b>Problems in Crystallography of Quasicrystals and Imperfectly Ordered Crystals</b>	481
T. Janssen	
<b>Quasicrystal Structure, Approximants and Defects</b>	487
F.H. Li	
<b>Physical Properties in Quasicrystals: Past, Present and Future</b>	491
T. Fujiwara	