

# Table of Contents

## Preface

### Development of the Disclination Concept

F. Kroupa and L. Lejček 1

### Crystal Disclinations Versus Continuum Theory

K. Anthony 15

### Fundamentals of Disclination Theory: Development of Disclination-Dislocation Structures in Deformed Materials

A.E. Romanov 47

### TEM Identification of Disclinations in Plastically Deformed Crystals

V. Klemm, P. Klimanek and M. Motylenko 57

### Formation of Disorientations in Dislocation Structures during Plastic Deformation

W. Pantleon 73

### Modelling of Plastic Deformation by Means of Dislocation-Disclination Dynamics

M. Seefeldt and P. Klimanek 93

### Disclination Models for Misorientation Band Generation and Development

M.Y. Gutkin, A.E. Romanov and P. Klimanek 113

### Plastic Instabilities and Misoriented Crystal Lattice

R. Sedláček, J. Kratochvíl and W. Blum 121

### Local Material Rotation and Lattice Reorientation in Interaction of Differently Deformed Structural Elements

A.A. Zisman and V.V. Rybin 137

### Disclination Mode in Shear Microband Formation in Plastically Deformed Crystals

A.A. Zisman and V.V. Rybin 147

### Influence of Local Lattice Orientation on Grain Subdivision in 40% Cold-Rolled Aluminium

L. Delannay and P. van Houtte 157

### Modelling Microstructure-Based Anisotropy in BCC Polycrystals during Changing Strain Paths

B. Peeters, S.R. Kalidindi, C. Teodosiu, P. van Houtte and E. Aernoudt 163

### On Fluctuating Dislocation Entities of Grain Boundaries as Fields of Ambiguity

C. Solenthaler 169

### Modelling of Grain Boundary Structures by Means of Dislocations

A.A. Nazarov 193

### Atomistic Simulation of Grain Boundaries, Triple Junctions and Related Disclinations

O.A. Shenderova and D.W. Brenner 205

### On the Interaction of Grain Boundaries and Triple Junctions with a Free Surface

P. Müllner 215

### Disclination Patterning under Steady-State Creep at Intermediate Temperatures

M. Seefeldt and E.C. Aifantis 221

### Disclination Models for Deformation Twinning

P. Müllner 227

### Modeling Internal Twinning with Disclinations and Somigliana Dislocations

P. Müllner and A.E. Romanov 239

### Peculiarities of Domain Patterns in Epitaxially Grown Ferroelectric Thin Films

A. Ullrich, W. Pompe, J.S. Speck and A.E. Romanov 245

### The Disclination Approach to Nanostructured SPD Materials

R. Valiev, R.K. Islamgaliev and A.N. Tumentsev 255

### Misfit Disclination Structures in Nanocrystalline and Polycrystalline Films

A.L. Kolesnikova, I.A. Ovidko and A.E. Romanov 265

### Characteristics of a Zener Crack Wedged Open by a Disclination Dipole

M.S. Wu 277

### Disclination Mode of Intergrain Fracture in LiF Bicrystals under Single Slip Deformation

B.I. Smirnov 301