

Cambridge University Press

978-1-107-41335-1 - Materials Research Society Symposium Proceedings: Volume 589:

Advances in Materials Problem Solving with the Electron Microscope

Editors: Jim Bentley, Charles Allen, Uli Dahmen and Ivan Petrov

Index

[More information](#)

## AUTHOR INDEX

- Abelson, J.R., 155  
 Akita, T., 253  
 Anderson, Ian M., 123, 329  
 Appel, F., 105  
 Appleton, R.S., 27  
 Arai, S., 117  
 Arslan, I., 311  
  
 Bache, I.C., 211  
 Belak, James, 347  
 Bentley, J., 383, 395  
 Bharadwaj, Mridula D., 389  
 Bisschop, J., 141  
 Boxall, Deborah L., 265  
 Brill, G., 197  
 Browning, N.D., 69, 311  
 Busby, J.T., 295  
  
 Calderon, H.A., 99  
 Calzado, L., 99  
 Camatini, Marina, 147  
 Campbell, Geoffrey H., 301, 347  
 Chang, L-S., 307  
 Cheng, J-Y., 247  
 Cho, K.G., 203  
 Citrin, P.H., 173  
 Corbetta, Gaia M., 147  
 Cosandey, F., 235  
 Crosta, Giovanni F., 147  
 Crozier, P.A., 197  
 Cullis, A.G., 167  
  
 Dahmen, U., 273  
 de Heer, W.A., 217  
 De Hosson, J.Th.M., 81  
 Deymier, P.A., 353  
 Dickey, E.C., 323  
 Dolukhanyan, Tigran, 147  
 Donald, A.M., 211  
 Dunin-Borkowski, R.E., 13  
 Durfee, C.S., 27  
 Duscher, G., 203  
  
 Erwin, M., 229  
 Evans, N.D., 383, 395  
  
 Fan, X.D., 203, 323  
 Flynn, C.P., 27  
 Foiles, Stephen M., 301, 347  
 Freitag, B., 289  
 Freund, L.B., 51  
  
 Gao, H-J., 203  
 Gao, R.P., 217  
  
 Gazda, J., 365, 371  
 Gibson, J. Murray, 155, 247, 389  
 Giuliani, Giampaolo, 147  
 Goehner, R.P., 39  
 Gossmann, H.J., 173  
 Grasby, T.J., 167  
 Gupta, Anu, 389  
 Gust, W., 307  
  
 Habermeier, Claus, 3  
 Haruta, M., 253  
 Hetherington, C.J.D., 359  
 Hilton, Gene, 75  
 Hofmeister, W.H., 123  
 Holloway, P.H., 203  
  
 Imamura, P.H., 383  
 Inoue, J., 51  
 Irwin, Kent, 75  
 Ito, Y., 69  
  
 Jacobson, D.C., 247  
 James, E.M., 311  
 Jiang, N., 377  
 Jin, H-C., 155  
  
 Kadavanich, A.V., 229  
 Kardynal, B., 13  
 Keenan, Michael R., 329  
 Kelm, K., 289  
 Kenik, Edward A., 265, 295  
 Kikuchi, Y., 185  
 Kilaas, R., 99, 273  
 King, A.H., 111  
 King, Wayne E., 301, 347  
 Kinoshita, C., 129  
 Kippeny, T., 229  
 Kishida, K., 311  
 Kisielowski, C., 99  
 Klie, R.F., 69  
 Kohyama, M., 341  
 Kotaka, Y., 185  
 Kotula, Paul G., 329  
 Kumar, D., 203  
  
 Leicht, M., 93  
 Liu, Jingyue, 259  
 Lorenz, U., 105  
 Lukehart, Charles M., 265  
 Luzzi, D.E., 223  
  
 Ma, Kai, 3  
 Mader, W., 289, 335  
 Marek, T., 93

Cambridge University Press

978-1-107-41335-1 - Materials Research Society Symposium Proceedings: Volume 589:

Advances in Materials Problem Solving with the Electron Microscope

Editors: Jim Bentley, Charles Allen, Uli Dahmen and Ivan Petrov

Index

[More information](#)

- Martinis, John, 75  
 Matsumura, S., 129  
 Mayer, J., 279  
 Mazanec, T.J., 69  
 McCarthy, J.M., 179  
 McCartney, M.R., 13  
 Mecartney, M.L., 383  
 Michael, J.R., 39  
 Miller, T.M., 123  
 Miyai, H., 117  
 Moriarty, John A., 347  
 Muller, D.A., 173  
 Mundscha, M., 27  
 Muto, S., 117  
  
 Naedele, Dirk, 135  
 Newbury, Dale, 75  
 Nicholls, A.W., 311  
 Norris, D.J., 167  
 Nouet, G., 191  
  
 Oehring, M., 105  
 Ondrejcek, M., 27  
  
 Palasantzas, G., 81  
 Pantelides, Sokrates T., 241  
 Papworth, Adam J., 87  
 Park, Dong-Won, 3  
 Parker, E.H.C., 167  
 Pennycook, Stephen J., 203, 229, 241, 323  
 Plitzko, Jürgen M., 279, 301  
 Poncharal, P., 217  
 Pond, R.C., 191  
 Potin, V., 191  
  
 Radmilovic, V., 273  
 Radulescu, F., 179  
 Rangarajan, S., 111  
 Redjaïmia, A., 161  
 Robertson, I.M., 57  
 Rosenthal, S.J., 229  
 Rühle, M., 307  
 Rujirawat, S., 197  
 Ruterana, P., 161, 191  
  
 Saka, H., 117  
 Sane, A., 69  
 Scheinfein, M.R., 13  
 Schmalzried, C., 289  
 Schuer, C., 93  
 Schwartzman, A.F., 51  
 Schweda, Eberhard, 135  
 Shamsuzzoha, M., 353  
 Sharma, Renu, 135  
 Sigle, W., 307  
  
 Silcox, J., 173, 377  
 Sinclair, Robert, 3  
 Singh, R.K., 203  
 Sinnott, S.B., 323  
 Sivananthan, S., 197  
 Smith, B.W., 223  
 Smith, David J., 13, 197, 353  
 Smith, P.L., 365, 371  
 Soeda, T., 129  
 Sohlberg, Karl, 241  
 Stach, E.A., 179  
 Stadelmann, P., 235  
 Steinecker, A., 335  
 Stelmashenko, N., 211  
 Stemmer, S., 69, 311  
 Stokes, D.J., 211  
 Strunk, H.P., 93  
 Sung, Changmo, 147  
 Swiech, W., 27  
  
 Tanaka, K., 253, 341  
 Telle, R., 289  
 Thiel, B.L., 211  
 Treacy, M.M.J., 155, 247  
 Tsen, S-C.Y., 197  
 Tsubota, S., 253  
 Tsukimoto, S., 117  
  
 van Agterveld, D.T.L., 81  
 Vanfleet, R., 173  
 van Mier, J.G.M., 141  
 Volkov, V.V., 19  
 Voyles, P.M., 155, 247  
  
 Walter, K.C., 395  
 Wang, C.Y., 99  
 Wang, L., 123  
 Wang, Z.L., 217  
 Was, G.S., 295  
 Watanabe, K., 185  
 Wessler, B., 335  
 White, R.A., 365  
 Williams, David B., 87  
 Wittig, J.E., 123  
 Wollman, David, 75  
  
 Xin, Y., 311  
  
 Yamazaki, T., 185  
 Yang, Judith C., 389  
 Yong, M., 323  
  
 Zaluzec, N.J., 129  
 Zhao, J., 365  
 Zhu, Yimei, 19

Cambridge University Press

978-1-107-41335-1 - Materials Research Society Symposium Proceedings: Volume 589:

Advances in Materials Problem Solving with the Electron Microscope

Editors: Jim Bentley, Charles Allen, Uli Dahmen and Ivan Petrov

Index

[More information](#)

## SUBJECT INDEX

- ablation, 203
- AEM (see analytical electron microscopy)
- AES (see Auger electron spectroscopy)
- AFM (see atomic force microscopy)
- aging, 161
- ALCHEMI (see atom location by channeling enhanced microanalysis)
- Al-Cu, 117, 161, 301, 365, 371
- Al<sub>2</sub>CuMg, 273
- Al<sub>7</sub>Cu<sub>3</sub>Zr<sub>2</sub>, 161
- AlN, 365
- α-Ge, 179
- Al-Si, 117
- alloy(s), 3, 81, 99, 105, 117, 161, 167, 273, 295, 329, 371
  - eutectic, 117
- alumina, 241, 329, 335
- aluminum, 51, 117, 301, 353
- amorphous semiconductors, 155, 247
- analytical electron microscopy, 147, 265, 295, 301, 383, 395
  - anion exchange, 135
- anisotropic elasticity calculations, 191
- annealing, 179, 223, 235, 301, 307, 353, 359
- annular dark-field imaging, 173, 185, 229, 253
- anti-reflection coatings, 365
- atom location by channeling enhanced microanalysis, 123, 129
- atomic
  - force microscopy, 81
  - resolution imaging, 311
  - scale defect chemistry, 69
- atomistic simulations, 347
- Auger electron microscopy/spectroscopy, 81
- austenite(-), 87
  - ferrites, 161
- Au/TiO<sub>2</sub>, 235, 253
- automobile tires, 147
- ballistic quantum conductance, 217
- bending modulus, 217
- β-SiC, 341
- bicrystal(s), 307, 353, 359
- bimetallics, 265
- bismuth, 307
- bonding states, 279, 395
- brazing, 329
- brownmillerite structure, 69
- C60, 223
- carbon,
  - amorphous, 279, 395
  - diamond-like, 395
  - nanotube, 217, 223
- catalysts, 235, 241, 253, 259, 265
- cathodoluminescence, 203
- CBED (see convergent beam electron diffraction)
- CdSe, 229
- CdTe, 197
- CdTe/ZnTe, 197
- cement-based materials, 141
- ceramic(s), 69, 111, 329
- chromium, 3, 123, 377
- climb velocities, 105
- clusters, 129, 241
- Co/Au/Ni, 13
- cobalt(-) 3, 13
  - chromium-X alloy, 3
- coherency strain fields, 99
- coincidence site lattice model, 191
- cold rolling, 353
- complex fluids, 211
- continuous random network, 247
- controlled environment, 57, 135
- convergent beam electron diffraction, 51, 93, 99
- copper(-), 301, 307, 359, 389
  - silver eutectic alloys, 329
- Cr, 3, 123, 377
- cracking, 111, 141
- creep, 105
- crystallography, 39
- Cu-Al, 371
- Cu-Bi, 81
- Cu-O, 389
- Cu<sub>2</sub>S, 81
- Cu-Sb, 81
- Darip, 99
- dark-field images, 197
- dead layer, 203
- defects, 69, 105, 129, 197, 295
- delamination, 111
- δ-doped layer, 173
- δ-phase, 161
- diamond(-), 279
  - like carbon, 395
- diffusion(-), 377
  - assisted dislocation processes, 105
  - bonding, 301, 347
  - zinc, 197
- direct methanol fuel cells, 265
- dislocation(s), 57, 105, 191
  - climb, 105
  - edge threading, 191
- disorder, 129, 155
- domain walls, 19
- EBSD (see electron backscatter diffraction)
- EDS (see energy dispersive x-ray spectrometry)
- EDX (see energy dispersive x-ray spectroscopy)
- EELS (see electron energy loss spectroscopy)

Cambridge University Press

978-1-107-41335-1 - Materials Research Society Symposium Proceedings: Volume 589:

Advances in Materials Problem Solving with the Electron Microscope

Editors: Jim Bentley, Charles Allen, Uli Dahmen and Ivan Petrov

Index

[More information](#)

- EFTEM (see energy-filtered transmission electron microscopy)
- electromagnetic levitation, 123
- electron
- backscatter diffraction, 39, 235
  - diffraction patterns, selected area, 147
  - energy-loss spectroscopy, 69, 135, 147, 167, 173, 253, 279, 311, 341, 377, 395
  - field emission, 217
  - holography, 13
  - spectroscopic imaging, 279, 289, 301
- ELNES (see energy-loss near-edge structure)
- embrittlement, 57, 307
- emulsions, 211
- energy
- dispersive x-ray spectrometry/spectroscopy, 75, 129, 147, 161, 197, 265, 301, 307, 329, 383,
  - filtered transmission electron microscopy, 167, 279, 289, 365, 371, 395
  - loss near-edge structure, 279, 395
- environmental scanning electron microscopy, 141, 211
- ESEM (see environmental scanning electron microscopy)
- ESI (see electron spectroscopic imaging)
- exit wave reconstruction, 301, 335
- extrusion, 161
- facets, 307, 359
- FIB (see focused ion beam)
- field emission transmission electron microscopy, 335, 341
- fluctuation microscopy, 155, 247
- fluorite structure, 323
- focal plane arrays, 197
- focused ion beam, 179, 365
- fullerenes, 223
- furnace cooling, 123
- GaAs, 179, 185
- low-temperature grown, 93
- $\gamma$ -alumina, 241
- GaN, 191
- Gatan imaging filter, 135, 347, 365, 371, 395
- Ge, 167
- gels, 211
- Generalized Pseudopotential Theory, 347
- glass, 377, 383
- gold, 359
- grain(s), 19
- boundaries, 19, 51, 81, 87, 191, 295, 301, 307, 323, 341, 347, 353, 371, 383
  - sizes, 3
- HAADF (see high angle annular dark-field)
- HARECXs (see high angular resolution electron channeling x-ray spectroscopy)
- heterophase molecular materials, 211
- high
- angle annular dark-field, 173, 185, 229, 253
  - angular resolution electron channeling x-ray spectroscopy, 129
  - resolution
    - electron microscopy, 99, 105, 117, 161, 191, 197, 235, 273, 341, 353, 359
    - energy-dispersive spectroscopy, 265
    - scanning electron microscopy, 259
    - transmission electron microscopy, 167, 235, 253, 273, 289, 301, 335, 347
    - x-ray diffraction, 93
    - z-contrast imaging, 69, 185, 203, 229, 241, 253, 323  - temperature structural materials, 123
- higher-order Laue zone, 39, 51
- holographic reconstruction, 301
- hollow-cone dark-field, 155
- HOLZ (see higher-order Laue zone)
- Hough transform, 51, 93
- HREM (see high resolution electron microscopy)
- HR-XRD (see high-resolution x-ray diffraction)
- hydrogen embrittlement, 57
- IASCC (see irradiation-assisted stress corrosion cracking)
- image
- processing, 191, 273
  - simulations, 191
- in situ*
- annealing, 179
  - deformation, 57
  - fracture, 81
  - microscopy, 117, 135, 389
- infrared, 197
- interatomic potentials, 347
- interconnects, 365, 371
- interface(s), 235, 253, 279, 301, 311, 329, 365, 371, 377
- broadening, 167
  - lattice misfit, 235
  - structure, 27, 197, 335, 353
- intergranular phases, 383
- ion implantation, 247, 395
- irradiation(-), 129, 223, 295
- assisted stress corrosion cracking, 295
- Kovar, 329
- $\text{LaAl}_{11}\text{O}_{18}$ , 335
- LACBED (see large angle convergent beam electron diffraction)
- lamellae, 105
- Landau-Lifshitz-Gilbert equation, 13
- large angle convergent beam electron diffraction, 129
- laser
- ablation, 203
  - vaporization, 223
- LEED (see low energy electron diffraction)
- LEEM (see low energy electron microscopy)

Cambridge University Press

978-1-107-41335-1 - Materials Research Society Symposium Proceedings: Volume 589:

Advances in Materials Problem Solving with the Electron Microscope

Editors: Jim Bentley, Charles Allen, Uli Dahmen and Ivan Petrov

Index

[More information](#)

- low energy electron
  - diffraction, 27
  - microscopy, 27
- magnesium aluminate spinel, 129
- magnetic
  - flux mapping, 19
  - materials, 3, 13, 19
  - properties, 3, 19
- magnetization reversal, 13, 19
- magnetoplumbite structure, 335
- medium-range order, 155, 247
- melting, 117
- microanalysis, 75, 123, 129, 147, 259
- microcalorimeter, 75
- microcracks, shrinkage, 141
- microdiffraction, 161
- microdomains, 69
- micromagnetic calculations, 13
- microscopy,
  - Foucault-Lorentz, 19
  - Fresnel, 19
- Mo, 27, 87, 347
- moisture, 389
- molybdenum, 27, 87, 347
- mortar, 141
- mosaic grain boundary dislocations, 191
- MOSFET, 167
- nanobalance, 217
- nanocomposites, 265
- nanofaceting, 27
- nanomeasurements, 217
- nanoparticles, 229, 259, 265
- nanoscale, 19, 75, 81, 167, 217, 223, 259, 377
- nanosstructure, 13
- nanotube, 217, 223
- Nb, 27, 123, 347
- Nd-Fe-B, 19
- Ni-Al, 99
- 3.5NiCrMo steels, 87
- nitridation, 135
- nucleation, 19, 27, 117, 241
- ohmic contacts, 179
- Ospray technique, 161
- oxidation, 389
- oxide glasses, 377
- oxygen(-)
  - deficient perovskite materials, 69
  - separation membrane, 69
- paracrystalline structures, 247
- parallel electron energy loss spectrometer, 377
- particle analysis, 39
- Pd, 179
- PdGe, 179
- PEELS (see parallel electron energy loss spectrometer)
- perovskite materials, 69
- phase
  - identification, 39, 161, 329
  - transformation, 105, 123, 273
- phosphorus, 87
- pinning centers, 19
- plasma sprayed coatings, 111
- polymer host, 229
- pores, 203, 307
- precipitates, 81, 99, 161, 271, 273, 289
- Pt, 241
- Pt<sub>3</sub>Mo, 265
- PtRu, 265
- PtSn, 265
- quantum mechanical calculation, 241
- radiation-induced disordering/segregation, 29, 295
- rare earth hexaaluminates, 335
- RBS (see Rutherford backscattering spectroscopy)
- reactive sponge property, 241
- resistivity, 371
- rubber, 147
- Rutherford backscattering spectroscopy, 371
- S-phase precipitate, 273
- Sb, 173
- scanning
  - Auger, 81
  - electron microscopy, 39, 75, 81, 111, 147, 259, 329
  - transmission electron microscopy, 69, 173, 185, 203, 229, 241, 295, 307, 311, 323
- secondary ion mass spectrometry/spectroscopy, 167, 371
- segregation, 81, 87, 167, 301, 307
- SEM (see scanning electron microscopy)
- SiC, 341
- SiGe, 167
- silicon, 173, 185
  - amorphous, 247
- SIMS (see secondary ion mass spectrometry)
- solidification, 117
  - rapid, 123
- specimen current imaging, 111
- spectrum imaging, 295, 329
- spinel(s), 129, 335
- splats, 111, 123
- SrCoO<sub>3-δ</sub>, 69
- stabilization, 135
- steels, 87
  - stainless, 161, 195
  - super-clean, 87
- STEM (see scanning transmission electron microscopy)
- step edge coalescence, 27
- STGB (see symmetric tilt grain boundary)
- strain
  - fields, 99
  - tensor, 51

Cambridge University Press

978-1-107-41335-1 - Materials Research Society Symposium Proceedings: Volume 589:

Advances in Materials Problem Solving with the Electron Microscope

Editors: Jim Bentley, Charles Allen, Uli Dahmen and Ivan Petrov

Index

[More information](#)

- structural relaxation, 247
- structure refinement, 273
- substrate,
  - germanium, 359
  - glass, 3
  - LaAlO<sub>3</sub>, 203
  - nickel-phosphorus plated aluminum, 3
  - sapphire, 27, 191, 335
  - silicon, 167, 197
  - Si<sub>3</sub>N<sub>4</sub>, 13
  - SiO<sub>2</sub>, 371
  - stainless steel, 111
- supported metal catalysts, 259, 265
- surface topography, 27
- symmetric tilt grain boundary(ies), 301, 323, 347
- Ta, 347
- τ-phase, 161
- TEM (see transmission electron microscopy)
- temper embrittlement, 87
- temperature-resolved transmission electron microscopy, 135
- tetragonal distortion, 93
- thermal cycling, 365
- thin film(s), 51, 93, 111, 191, 203, 235, 279, 335, 371, 377
- three-dimensional imaging, 229
- TiAl, 105, 123
- TiAlCr, 123
- TiAlNb, 123
- TiB<sub>2</sub>-WB<sub>2</sub>-CrB<sub>2</sub>, 289
- time-resolved transmission electron microscopy, 135
- tire(s), 147
  - dust, 147
- Ti/TiN, 365, 371
- transition edge sensor microcalorimeter, 75
- transmission electron microscopy, 3, 13, 19, 57, 105, 135, 167, 179, 217, 223, 279, 311, 359, 389
  - variable coherence, 155, 247
- tread, 147
- two-dimensional dopant sheets, 173
- ultra-high vacuum, 389
- vacancy(ies), 129, 197
  - supersaturation, 105
- variable coherence microscopy, 155, 247
- W<sub>0.5</sub>Ti<sub>0.5</sub>B, 289
- water vapor, 389
- wavelength dispersive spectrometry, 75
- XPS (see x-ray photoelectron spectroscopy)
- x-ray
  - diffraction, 371
  - elemental mapping, 87
  - microanalysis, 75, 123, 129, 147, 259, 265, 295, 307, 329
  - photoelectron spectroscopy, 365
- XRD (see x-ray diffraction)
- Y<sub>2</sub>O<sub>3</sub>:Eu, 203
- YSZ (see yttria-stabilized zirconia)
- yttria-stabilized zirconia, 111, 323, 383
- z-contrast imaging, 69, 185, 203, 229, 241, 253, 323
- zirconia, 135, 323
  - polycrystalline, 383
  - yttria-stabilized, 111, 323, 383
- ZnTe, 197