

Index

A

- Abbe, Ernst, 4, 11, 342
- acceleration voltage, choice
 - of, 176, 243
- achromatic lens, 14, 15
- adhesive tape, 140, 153, 154, 318, 347
- air drying, 106–107, 117
- Airy disc, 54, 55
- Airy, George Biddell, 54
- aldehyde, 108, 110, 116
- Al-Haitham, Ibn, 2
- alpha particles vs. photons, 38
- alpha (α) radiation, 38
- angular ridges, 336
- anode cylinder, 81
- aperture, choice of, 186–187
- aperture angle, 4, 11–14
- apochromat lens, 13, 15
- array tomography, 253, 318, 319, 324
- astigmatism, 16–17, 46, 92–93, 176,
 - 190, 192, 210, 227, 241–243, 259,
 - 280, 284, 299, 333, 334, 355
- atom
 - gallium atoms, 282–284, 290
 - primary electron with, 40
- atomic masses, 36
- atomic nuclei/nucleus, 36–37
- atomic theory, 36
- Autrata BSE detector, 100–101,
 - 181, 204
- Autrata detector, 101, 204, 206, 216

B

- backscattered electrons (BSE), 40,
 - 41, 168, 209
- detectors, 50, 101
 - Autrata BSE detector, 100–101
 - in-lens EsB detector, 101
 - QBSD, 101–102
- microscopy, 208
- signal
 - crystal orientation contrast, 52
 - material contrast, 250
 - material electrons contrast, 51
 - topography contrast, 49

- Bain, Alexander, 28
- Barley chromosome, 23, 79, 204, 215,
 - 255, 260, 263, 360
- Barrel distortions, 18, 93
- beam cathode electron, 81
 - anode and Wehnelt cylinder, 81–85
- beam size, 231
- beta (β) radiation, 38
- biological molecules, 5
- biological sample(s), 179
 - air drying, 106–107
 - chemical fixation, 108–121
 - critical point drying, 117–121
 - dehydration, 116–117
 - drop-cryo preparation, 122–123
 - epoxy resin, 126–127
 - FIB pins, 126–127
 - freeze fractures, 124–125
 - preparation, 127–129
- biological specimens, 33, 55, 114, 126,
 - 130, 142, 155, 176, 209, 231, 240,
 - 241, 243, 248, 250, 252, 270, 302,
 - 307, 310, 317
- examinations of, 176
- braking radiation, 102, 265
- Braun, Karl Ferdinand, 73
- Braunsche Röhre, 73
- Braun tube, 73, 86
- bright field (BF) microscopy, 19,
 - 20, 23, 171
- built-in ultramicrotome, 311

C

- cacodylate buffer, 111–113
- carbon coating, 33, 140, 142, 150–151,
 - 155, 163, 170, 173, 179, 209, 286,
 - 287, 297, 312, 318
- carbon evaporator, 150–151, 170
- carbon specimens, 24, 250
- cathode electron source, 72
 - beam generation, 81
 - cold field emission cathode, 77–78
 - hairpin cathode, 74–75
 - LaB₆ cathode, 75
 - Schöttky emitter, 76
 - SEM, 78
 - TEM and SEM, 84–85
 - tip cathode, 75
- cathode ray tube (CRT), 72, 73, 81, 96

- cathode sputtering, 142
 - cell division, 159
 - cell organelles, 32, 112, 152, 269, 315, 331, 334, 338
 - cell structures, 110, 174, 197, 207, 252, 260, 272, 293, 331, 334–336
 - chamber SE detector, 43, 44, 99, 180, 183, 185, 188, 198, 200, 202, 216, 234, 262, 284, 285
 - characteristic X-rays, 40, 41, 102, 264, 266
 - chemical fixation
 - critical point drying, 117–121
 - dehydration of samples, 116–117
 - formaldehyde, 108–109
 - glutaraldehyde, 110
 - osmium tetroxide, 112–113
 - specimen preparation, 114–115
 - washing process, 115–116
 - chromatic aberration, 14, 15, 28, 34, 90, 91, 95
 - chronology, 33–34
 - clamps, 140
 - classic red-green glasses, 368
 - CNT tape (conductive), 318, 321
 - cohesion of water, 106, 107
 - cold field emission cathode, 76, 77, 83, 84
 - collecting coil, 86
 - coma, 17–18, 91, 92
 - coma error, 17–18, 91
 - conductive carbon cement, 134
 - conductive coating, 134, 140, 142, 146, 147, 151, 312, 333
 - conductive mounting, 132, 286
 - conductive silver, 60, 123, 125, 131–133
 - conductive tabs (Leit-Tabs), 125, 136, 137, 141, 245, 347
 - continuous averaging
 - microscopy, 195
 - contrast electrons formation, 46
 - topography contrast, 46–49
 - converging lens, 9, 15, 90, 94, 95
 - cornea, 8
 - corpuscule, 38
 - correlative light and electron microscopy (CLEM), 8, 258
 - adapter for, 141
 - critical point drying, 160–161
 - cryo samples, 164–167
 - FIB/SEM, 156–157
 - guard cells, 164–165
 - larger slide pieces mounting, 170
 - semi-thin and thick
 - sections, 168–170
 - slides with coordinates, 159–160
 - stamp, 171
 - toluidine blue, 169
 - workflow for, 173–175
 - critical point drying (CPD) samples, 117–119, 125, 152, 153, 155, 160–162, 174, 205, 211, 250, 350
 - cryo-electron microscopy, 326
 - cryo-fixation, 33
 - cryo-fracture technique, 33, 124
 - cryo-microscopy, 333–339
 - cryo-SEM
 - conductive coating, 333
 - cryo-3D, 339–341
 - cryo-fixation, 326–328
 - attention, 327
 - cryo-fracture, 328–333
 - cryo-microscopy, 333–338
 - samples, 186
 - cryo-specimen, 332
 - crystal orientation contrast
 - BSE signal, 52–53
 - SE signal, 52–53
 - current density, 75, 306–308
 - curtaining, 300–304, 309
 - cushion distortion, 93
 - cyanobacterium
 - Synechocystis spec.* 337
 - Cystodytes dellechiaiei*, 125, 338
- D**
- Danilatos, Gerasimos, 342
 - darkfield microscopy (DF), 20
 - deep etching, 337, 338
 - dehydration of samples, 116–117
 - Democritus, 36
 - diaminobenzidine (DAB), 256–257
 - diamond knife, 24, 127, 297, 310–313, 318, 319, 335
 - diaphragm pump, 64, 68
 - differential interference contrast, 21
 - dimethyl sulfoxide (DMSO), 124

- distortions, 17, 18, 60, 91, 93, 186, 187, 195–197, 199, 200, 243–245, 357
- Divini, Eustachio, 14
- double-sided adhesive tape, 140, 153, 347
- drop-cryofixation, 160, 161
- drop-cryofixation, all stains (DAPI), 23, 160, 163, 164
- drop-cryo preparation, 79, 122–123, 209

- E**
- edge resolution, 55
- EDX detector, 102–103, 265, 269, 270
- electrical conductivity, 56–60, 135, 281
- electrical resistances, 56
- electromagnetic lenses, 86
 - helical path of electrons, 88–89
 - hysteresis curve, 89
 - lens errors, 90–93
 - pole piece, 87–88
 - principle, 87
- electromagnetic lenses vs. electrostatic lens, 95
- electromagnetic wave, 8, 38, 265
- electron(s)
 - charge neutrality, 57
 - charging effects, 56–61
 - contrast formation, 45–53
 - crystal orientation contrast, 52–53
 - energy distribution of SE, 42–45
 - helical path of, 88–89
 - interaction of, 38–39
 - material contrast, 50–51
 - mean free path length, 39
 - resolution, 55
 - secondary and backscattered electrons, 40–42
 - wavelengths and velocities, 80
- electron-dense inclusions, 299, 353
- electron microscopes (EM), 243
 - BSE detectors, 101
 - electromagnetic lenses, 85–93
 - electrostatic lens, 94–95
 - scan generator, 97
- SE detectors
 - Everhart–Thornley detector, 98–99
 - in-lens SE-detector, 101
 - vacuum, 62–63
 - X-rays, 102–103
- electron microscopy
 - fundamentals of, 24
 - light microscope, 26
 - scanning electron microscope, 28–35
 - scanning history, 28–29
 - transmission electron microscope, 24–28
- electrostatic lens, 83, 84, 94–95, 280
 - vs. electromagnetic lenses, 95
- elemental distribution, 264, 270, 274, 279
- energy dispersive X-ray analysis (EDX), 264
 - operation, 268–269
 - acceleration voltage, 270–271
 - area analysis/point analysis, 271–272
 - distribution analysis (Linescan), 271–274
 - distribution analysis (mapping), 274–277
 - EDX-mapping in, Cryo-SEM, 277–278
 - EDX-mapping, on ultrathin sections, 278–279
 - operating parameters, 269–270
 - X-ray analysis, 264–265
 - X-ray spectrum, 266–267
- energy selective backscattered electron detector, 208
- environmental scanning electron microscope (ESEM), 342
- epoxy resin block, 290, 363
- epoxy resins, 126, 166, 289, 290, 293
- epoxy resin sample, 126, 290, 292
- EsB detector, 101, 151, 165, 208–218, 257, 262, 284
- etching, 77, 92, 328, 329, 331, 332, 334, 336–338

- Everhart, Thomas Eugene, 98
 Everhart–Thornley (ET) detector, 43,
 57, 98–100, 198–199, 262
 eye, 8
 light source, 13–14
 resolving power of, 8–9
 eyepiece, 10, 11, 13, 14, 27
- F**
 Falcon™, 162, 164
 fibrillar structures, 338
 filamentous cyanobacterium,
 20–22, 167, 340
 fluorescence microscopy, 22, 23
 focused ion beam (FIB)
 mode microscopy, 202–203,
 216–219
 pins, 126–127
 focused ion beam (FIB)/SEM, 280
 ablation with, ion beam, 288–291
 beam profile and ablation pro-
 file, 291–292
 beam profiles,
 checking, 289–290
 ion current, checking, 289
 ion current, selection of, 288
 curtaining, 300–302
 design of, ion gun, 280
 dynamic focus, 298–299
 gallium, 280–281
 crystal orientation con-
 trast, 284–285
 detection of, ions, 284
 gallium emitter, 281–283
 mode of action, 284
 GIS, 304–305
 electron beam deposition, with
 platinum, 305–306
 ion beam deposition, with plati-
 num, 306–309
 milling on, vertical wall, 296–297
 operation, 286
 coating with carbon, 286–287
 conductive mounting, 286
 rippling, 302–303
 tilt compensation, 298
 track WD, 299
 trench milling, with ramp, 292–295
 geometry of, redeposi-
 tion, 295–296
 formaldehyde, 108–110, 122, 160
 frame averaging microscopy,
 60, 195, 245
 frame integration, 60, 140,
 196–197, 245
 frame integration micros-
 copy, 196–197
 free-standing structures, 366–367
 freeze fractures, 124–125
 freeze fracturing unit, 328, 332
 Fresnel, Jean Augustin, 4
- G**
 Gabor resolution, 54
 Gallium ($_{31}\text{Ga}$), 280–281
 gallium atoms, 282–284, 290
 gallium deposition, 276
 gallium liquid film, 283
 gamma (γ) radiation, 38–39
 gas injection system (GIS), 61,
 304–306, 313
 gas molecules, 62–63, 66–71, 75,
 77, 78, 345
 gas molecules, mean free
 path, 62–63
 Geißler tubes, 72
 giant chromosome, 181, 255
 glutaraldehyde, 25, 110–117, 119,
 122, 124, 163, 252–254, 256,
 259, 262, 323
 Grove, William Robert, 142
 guard cells, 22, 165, 227, 271
- H**
 hairpin cathodes, 74–83, 85
 Heisenberg's uncertainty
 principle, 77
 HeLa cells, 162, 170, 187,
 203, 218, 364
 Helmholtz, Hermann v. 38
 high optical quality, 18–19
 high-pressure cryofixation
 (HPF), 166, 172, 174, 327, 328
 Hittorf, J. W. 85, 86
 Hooke, Robert, 3, 10
 horizontal specimen, 361–364

- hot field emission cathode, 76
 Huygens, Christiaan, 3
 hysteresis curve, 89
- I**
- image acquisition, 60, 180, 185, 186, 189, 192–194, 196, 244, 245, 253, 261–262, 311, 314, 324, 333, 355
 image optimization microscopy
 brightness and
 contrast, 220–225
 direction of illumination, 224–225
 image esthetics, 227–229
 scales, 229
 scan rotation, 226
 image pixel size, 231, 232
 image quality
 astigmatism, 241–242
 distortions, 243–245
 moiré effect, 246–247
 immuno-gold labeled cells, 249
 immuno-gold labels, 147, 148, 151, 160, 173, 210–212, 214, 215, 245, 248, 249, 251, 258–260, 262, 263, 318, 372, 373
 immuno-labeling, 157, 214, 216, 245, 258, 261
 indexed images, 222
 inelastic scattering electrons, 40, 42–44, 52, 91
 in-lens EsB detector, 101
 in-lens SE detector, 101, 200
 intermediate image plane, 10, 27
 ion beam deposition, with platinum, 306–309
 ion bombardment, 71, 288
 ion getter pump, 69, 80
- K**
- Kapton ribbon, 319
 Kapton tape, 318–319
 Kepler, Johannes, 2
 killer T cells, 357
 kinetic energy, 40, 63, 88, 98, 142, 143
 K-line, 265–267, 277
 K-shell, 266, 267
- L**
- LaB₆ cathode, 75
 lanthanum hexaboride cathodes, 75
 laser markers, 174
 Lawrence, Thomas, 3
 Leeuwenhoek's microscopes, 3, 10
 Leidenfrost effect, 326–327
 Leit-C^{org}, 134
 Leit-C-Plast, 135
 lens errors, 90
 astigmatism, 16–17, 93
 barrel distortion, 94
 bright field microscopy, 19
 chromatic aberration, 15, 90–91
 coma, 17–18, 91
 cushion distortion, 93
 damage/contaminations, 18–19
 distortions, 18–19
 spherical aberration, 14–15, 90
 lenses, 9
 electromagnetic lenses, 85–93
 spherical optical lenses, 15, 90
 light microscope (LM), 3, 11, 14, 24, 26, 27, 88, 156, 159, 251
 TEM, 26–28
 light rays, 11–14, 17, 91
 limiting resolution, 238–240
 line averaging microscopy, 194
 lipid-rich structures, 338
 liquid propane, 327
 Lorentz force, 88, 144
 L-shell, 266, 267
- M**
- magnetic quadrupoles, 92
Magnetobacterium bavaricum, 141, 172, 205, 248, 277, 279, 336
Magnetospirillum gryphiswaldense, 172, 336
 magnifying glass(es)
 classical microscope, 10
 intermediate image, 10
 lenses, 9–10
 microscope, 10
 material contrast
 BSE signal, 250–251
 immuno-gold labels, 258–260
 metal impregnations, 252

SE signal, 248–249
 material electrons contrast
 BSE signal, 51
 SE signal, 51
 Maxwell distribution, 63
 mean free path, 24, 25, 37, 39, 40,
 44, 62, 144, 205, 279, 313, 342
 metal impregnations, 252
 diaminobenzidine, 256–257
 osmium tetroxide, 252–253
 platinum blue, 254–255
 rOTO, 253–254
 OTO, 253
 microscopy
 acceleration voltage, 176–181
 aperture, 186–187
 Aurata BSE detector, 204–205
 BSE, 208
 chamber SE detector, 198–199
 FIB mode, 202–203, 216–219
 frame averaging, 195
 frame integration, 196–197
 image optimization
 brightness and contrast, 220–225
 direction of illumination, 224–225
 image esthetics, 227–229
 scales, 229
 scan rotation, 226
 in-lens EsB detector, 208–215
 in-lens SE detector, 200–201
 line averaging, 194
 pixel averaging, 193
 quadrant backscatter electron
 detector, 206–207
 scan area, 190–191
 scan mode, 192
 tilt angle, 188–190
 working distance, 182–185
 Middle Ages, 2
 modern scanning electron
 microscopy, 310
 moiré effect, 246–247
 molybdenum apertures, 283
 mouse axons, 323
 M-shell, 266
 multi-beam SEM (ZEISS
 MultiSEM), 324, 325

N

nano innovative microscopy, 78
 natural sciences, 2
 negative staining, 32, 230
 nitrogen molecules, 62, 63, 68, 313
 nitrogen slush, 326–327
 numerical aperture, 11–13

O

objective lens, 10, 11, 13, 26, 30, 31,
 88, 95, 96, 200, 243, 282
 oil diffusion pump, 66
 optical apparatus, 8
 optical lens
 astigmatism, 16–17
 optics
 and resolution, 10–11
 eye, 8–9
 lens errors, 14–18
 lenses and magnifying
 glasses, 9–10
 osmium tetroxide, 25, 112–114, 250,
 252–253, 260
 metal impregnations, 252–257
 OTO method, 253

P

paraformaldehyde, 108–109
 penning vacuum gauge, 70–71
 Pfeiffer vacuum technology, 63, 67
 phase contrast (Ph), 19–21, 23, 157,
 159, 160, 164, 169, 181, 296
 photons, 38, 45, 98
 Pirani vacuum meter, 70
 pixel averaging microscopy, 193
 pixel size, 55, 231–234,
 314–316, 322, 325
 plastic tape, 318
 platinum blue, 151, 181, 204, 205,
 211, 251, 254, 255
 platinum precursor
 molecules, 305, 307
 Pliny the Elder, 2
 Plücker, Julius, 72
 polarization contrast method, 21
 pole piece, 43, 59, 61, 86–88, 99,
 101–103, 130, 182, 198, 200,
 204, 206, 270, 335, 342–344

- pole shoe, 86, 88, 101
 pollen grains, 9, 59, 107, 133, 137, 347, 368, 369
 poly- β -hydroxy-butyric acid (C-K α), 277, 336
 polycrystalline surface, 284
 primary beam (PE), 40–44, 47, 48, 51, 52, 57, 59, 77, 85, 99–101, 199, 200, 204, 206, 208, 210, 265, 269, 270
 primary electrons (PE), 25, 40–42, 57, 61, 101, 205, 265
 atom, 40
 pseudo-reliefs, 21
 Ptolemy, Claudius, 2
- Q**
 quadrant back scatter detector (QBSD), 49, 101, 102, 179, 199, 206–207, 213–216, 261, 262, 274, 276, 287
 microscopy, 206–208
- R**
 radiation, types, 39
 radius helical path, 88
Rasterelektronenmikroskop, 28
 Rayleigh criterion, 55
 red alga (*Porphyridium cruentum*), 113, 168, 323
 residual gas molecules, 69–71, 75, 77
 resin embedded bacteria, 273
 resolution
 beam size and spot size, 231
 empty magnification, 240
 image quality
 astigmatism, 241–242
 distortions, 243–245
 moiré effect, 246–247
 limiting, 238–239
 parameters, 234–235
 pixel size, 231–234
 signal-to-noise ratio, 236–237
 rest masses, 36
 rippling, 302–303
 ROIs, 159, 164, 166–168, 170–173, 287, 320, 323
Röntgenstrahlen, 72
- Röntgen, W.C., 72, 264
 rotary pump, 65–66, 68
 rOTO, 124, 174, 181, 194, 207, 219, 253–254, 293, 300, 302, 311, 314–315, 321, 323
- S**
 scales, 184, 191, 220, 228–229, 246, 247, 344, 373
 scan area, 190–191
 scan mode, 192
 scanning electron microscope (SEM), 8, 24, 334
 cathode electron, 78–80
 electron microscopy, 28
 history, 28–29
 interior view, 61
 specimens, 32–33
 tobacco mosaic viruses, 32
 transmission electron microscopy, 29–30
 scan rotation, 191, 225–226, 246
 scan speed, 97, 192–197, 206, 245, 261, 299, 305, 307
 Schottky emitter, 76, 79, 83–85
 scintillator BSE detector, 344
Sebertia acuminata, 97, 338
 secondary electrons (SE), 31, 40, 41, 103
 detectors
 Everhart–Thornley detector, 98
 in-lens SE-detector, 101
 energy distribution, 42–43
 signal
 crystal orientation contrast, 52
 material contrast, 50, 248
 topography contrast, 46–48
 semi-thin and thick sections, 168–169
 serial block face SEM (SBF)
 comparison of, SFB and FIB/SEM, 316–317
 microscopy, 314–316
 preparation, 311–313
 shell electrons, 40, 43, 266
 shell model, 266
 signal mixing, 160, 262–263

- signal-to-noise ratio (S/N), 46, 55,
 60, 75, 147, 176, 179, 183,
 185–186, 188, 192–196, 199,
 202, 207, 210, 212, 219,
 232–233, 235–237, 298, 335,
 344, 348–349, 355
- specimen mounting for SEM
 adapter for CLEM, 141
 clamps, 140
 conductive carbon cement, 134
 conductive silver, 131–133
 conductive tabs, 136–137
 double-sided adhesive tape, 140
 Leit-C-Plast, 135
 sputtering, 142
 storage of, 152
 TEM, 141
 Tempfix™, 138–139
- specimen preparation, 114–115, 209
- specimen rotation, 226, 361–364
- specimens, electron micro-
 scopes, 31–33
- spherical aberration, 14–15, 90
- spherical optical lenses, 15, 90
- spot size, 230–232, 234
- sputtering, 142
 carbon coating, 150
 carbon evaporator, 150–151
 caution, 144
 coater design, 142–147
 decoration effects, 148–149
 layers, 146
- standard stubs, 104, 140
- stereo effect, 356, 358, 360–362
- stereo magnifier, 8, 28–30, 251, 355
- stereo SEM, 352–353
 anaglyph images, 368
 mounting, 368, 370–373
 red-cyan (red-blue), 368
 red-green, 368
 image detail selection, 366–367
 mounting stereo images, 365–366
 moving image, with beam shift, 356
 moving specimen, with stage
 shift, 354–355
 specimen rotation, 361–364
 specimen tilting, 357
 selection of, tilt angle, 357–361
- Stoney, George J., 38
- T**
 tantalum, 333
 Tempfix™, 125, 138–139, 155
 thin tissue sections, 164
 thiocarbonylhydrazide (TCH),
 125, 178, 253
 Thomson, Joseph John, 38, 72, 73
 3D display of, stereo image
 pairs, 352
 tillandsia (*Tillandsia usneoides*),
 344–346, 373
 tilt angle, 99, 104, 182, 188, 189, 198,
 200, 270, 304, 357–361
 tilt compensation, 189–190, 298
 tip cathode, 75, 83, 282
 tobacco mosaic viruses, 32
 toluidine blue, 169, 296
 topography contrast, 352
 BSE signal, 49
 SE-signal, 46–28
 transmission electron microscope
 (TEM), 24–28
 electron microscopy, 24
 scanning electron micro-
 scope, 30–31
 specimen mounting
 for SEM, 141
 specimens, 31–32
 tobacco mosaic virus, 32–33
 transmission mode (TEM) ultrathin
 sections, 310
 trimethyl(methylcyclopentadienyl)-
 platinum(IV), 305
 tungsten cathode, 74, 76–77, 281
 turbomolecular pump, 64,
 67–69, 130, 150
- U**
 ultramicrotome, 287, 310, 318
 ultrathin sections, 24, 25, 27, 32,
 39–40, 45, 116, 126–127, 141,
 147, 169, 177, 178, 191, 205,
 212, 241, 248–249, 252, 258,
 264, 278–279, 296, 310–311,
 318–321, 323, 325
- V**
 vacuum, 62
 cathode as electron source, 72

diaphragm pump, 64
gas molecules, mean free
 path, 62–63
ion getter pump, 69
measurement, 70
oil diffusion pump, 66
Penning vacuum gauge, 70–71
Pirani vacuum gauge, 70
rotary pump, 65
turbomolecular pump, 67–68
water jet pump, 64
van Leeuwenhoek, Antoni, 3
vibratome, 164, 181, 207, 308
von Ardenne, Manfred, 28, 30, 73
von Fraunhofer, Joseph, 4
VP-SEM, 33, 342–345
 VP operation, 345–350

W

“waterfall”, 300
water jet pump, 64, 66, 342
water molecules, 64, 332–333
water resistant stamp, 170, 171
Wehnelt, Arthur, 81, 94
Wehnelt cylinder, 31, 73,
 81–85, 280, 283

white light, visible spectrum, 8
working distance, 55, 79, 89, 93, 98,
 99, 101, 104, 105, 123, 132, 144,
 176, 182–186, 198–200,
 206–208, 213, 216, 224–225,
 231, 234, 236, 238, 243, 248,
 270, 277, 298, 339, 345,
 348, 354–355

X

X-ray quanta, 38, 97, 102, 103,
 264, 267, 270
X-rays, 25, 38, 40–42, 45, 72, 79, 97,
 102–103, 264–271
X-Strahlen, 72

Y

yttrium aluminum garnet (YAG)
 detector, 204
 single crystal, 204

Z

zebrafish, 321–322