

Index

- absorbance, 211, 229, 234,
 - 239–40, 245
 - frequency-independent, 240
 - optical, 98
- absorption, 33–34, 99, 152,
 - 155–58, 166, 169, 171, 175,
 - 191–92, 197, 224, 227, 230,
 - 235–36, 240
 - cavity-enhanced, 237
 - cavity-enhanced on-resonance,
 - 236
 - enhanced photon, 154
 - excitonic, 248
 - giant, 33
 - intensity-dependent, 101
 - interband transition, 211
 - limited, 258
 - linear, 95, 99, 123
 - polarisation-dependent, 99
 - saturable, 94–95, 97, 99
 - tunable, 211
 - two-photon, 259
- absorption spectroscopy, 6
 - transient, 46, 182
- AFM, *see* atomic force microscopy
- air-holes, 230–31, 238, 241,
 - 243–44, 249–50, 253
- Anderson localisation, 82
- angle-resolved photo-emission
 - spectroscopy (ARPES), 26–27,
 - 29
- ARPES, *see* angle-resolved photo-emission spectroscopy
- atomic force microscopy (AFM),
 - 4, 6, 30, 69–70, 74, 85–87, 90,
 - 231, 233, 261, 263
- axes, 75–76, 80–81, 238, 241, 245,
 - 247
 - armchair, 100
 - crystallographic, 35
 - long, 195
 - zigzag, 99
- bandgaps, 4–5, 25, 27–28, 30,
 - 33–35, 55–56, 94, 97–98, 115,
 - 128, 157, 253
 - defect-induced, 98
 - direct, 3, 7, 28, 30, 153, 159, 242,
 - 253
 - indirect, 28, 94, 214, 242
 - intrinsic, 3
 - large, 128
 - layer-dependent, 53
 - non-zero, 97
 - optical, 2, 155, 169, 209, 228
 - photonic, 245, 248
 - sizable, 153
 - sizable energy, 24
 - tunable, 56
 - zero, 25, 94
- band structures, 27–29, 33, 97,
 - 153, 155, 210
 - electronic, 28, 30, 210
 - layer-dependent electronic, 6
 - photonic, 244
 - scaled, 27
 - special Dirac energy, 95
 - thickness-dependent, 24
 - zero-bandgap electronic, 32
- biexciton, 6, 48–49
- bilayer graphene, 26–28, 32, 38
- binding energy, 25, 49, 156, 158,
 - 213

- black phosphorus (BP), 2, 7,
 - 23–24, 30, 35, 43, 50, 54–55,
 - 94, 98–100, 122–28, 209, 216,
 - 253–54
 - cavity-coupled, 254
 - exfoliated, 253
 - few-layer, 210, 253–54
 - thin, 254
- Bose–Einstein condensation, 182
- BP, *see* black phosphorus
- Bragg reflection, 230
- Brillouin zone, 26–27, 38, 202
- bulk materials, 28, 83, 211, 243,
 - 248
- bus waveguides, 224–25
 - low-loss, 264
 - side-coupled, 226–27
- cavities, 101–3, 107, 112, 122,
 - 127–28, 159–61, 180–81,
 - 189–90, 232–37, 240–41,
 - 245–48, 250, 253, 255–59, 262
 - all-anomalous, 125
 - bare, 233, 259
 - bare silicon, 259
 - dielectric, 191
 - dispersion map management,
 - 107
 - graphene-integrated, 234
 - integrated, 259
 - intrinsic, 233, 259
 - large normal dispersive, 107
 - long, 124
 - material-FP, 212
 - material-PPC, 231, 257
 - monolayer MoS₂-PP, 243
 - monolayer MoS₂-PPC, 244, 247
 - monolayer TMD-PPC, 250
 - monolayer WSe₂-PPC, 249
 - non-metallic, 172
 - photonic, 189
 - ring, 119, 125
 - side-coupled, 236
 - typical dissipative soliton, 107
 - unloaded, 235
 - cavity defect, 244–45, 248, 254
 - cavity-enhanced SHG, resolved,
 - 262
 - cavity modes, 160–61, 180–81,
 - 189, 231, 233, 239, 242,
 - 245–48, 251, 253, 255
 - cavity photons, 9–10, 108
 - CBM, *see* conduction band
 - minimum
 - CCD, *see* charge-coupled device
 - charge-coupled device (CCD), 232,
 - 261
 - chemical vapour deposition (CVD),
 - 32, 53, 85, 89, 96, 104, 108,
 - 111, 223, 258
 - CMOS, *see* complementary metal-
 - oxide semiconductor
 - complementary metal-oxide
 - semiconductor (CMOS),
 - 214–15, 228
 - conduction band minimum (CBM),
 - 28, 30, 35, 153, 172
 - continuous-wave (CW), 93, 112,
 - 118, 160, 199, 211, 244, 250,
 - 260–62
 - coupling, 2, 33, 179–80, 182,
 - 190–92, 196–98, 200, 202,
 - 204, 212, 218, 220–21, 225,
 - 227, 231–34
 - backward, 236
 - critical, 227
 - diffraction, 202
 - effective, 213
 - efficient, 236, 255
 - inhibited, 249
 - inter-layer, 27–28
 - non-linear, 204
 - orbit, 33
 - plasmon, 161
 - polarisation-dependent far-field,
 - 245
 - stacking-order-dependent
 - interlayer, 210

- strong, 182, 204, 232, 264
- tapered fibre, 236
- unique interlayer, 260
- waveguide-cavity, 236
- weak, 234
- crystal structures, 31, 43, 54–55, 152, 178
 - central symmetric, 177
- CVD, *see* chemical vapour deposition
- CVD graphene, 104–5, 109–10, 226, 237–38, 257
- CW, *see* continuous-wave

- Davydov splitting, 43
- DBR, *see* distributed Bragg reflector
- density functional theory (DFT), 26, 28, 33, 155
- device miniaturisation, 11–12, 14
- DFM, *see* difference frequency mixing
- DFT, *see* density functional theory
- dielectrics, 2, 48, 169, 197, 204, 210–11, 213, 225, 251
- difference frequency mixing (DFM), 176
- Dirac electrons, 94
- Dirac fermions, 4, 32
- direct-bandgap semiconductors, 6, 48, 122, 153, 157, 188
- distributed Bragg reflector (DBR), 9–10, 113, 180, 212
- doping, 40, 128, 152, 237
 - chemical, 210, 238
 - electrostatic, 179

- EBL, *see* electron beam lithography
- EDF, *see* erbium-doped fibre
- EL, *see* electro-luminescence
- electro-luminescence (EL), 166, 255–56
- electron beam lithography (EBL), 192

- electronic bandgaps, 31, 36–37, 155, 244
- electronic band structures, 23, 25–29, 35, 38, 40, 54, 56, 152–53
- emission, 36–38, 48–49, 159, 161, 163–64, 166, 168, 170–72, 188–92, 197–203, 242, 244–46, 248–51, 253, 255
- cavity-enhanced, 248
- exciton, 48–49, 250
- excitonic, 35
- far-field, 168, 255
- far-field angular, 200
- fluorescence, 56
- near-band-edge, 33
- negligible second-harmonic, 178
- on-resonance, 246
- phonon, 158
- photon, 8, 158
- polarisation-selective
 - directional, 202
- polarised, 37
- polarised exciton, 37
- radiative, 49, 168
- second-harmonic, 152
- single-photon, 188
- stimulated, 250
- erbium-doped fibre (EDF), 101–2, 105–6, 119, 122, 125–26
- evanescent field, 114, 125, 127, 218–19, 221, 224, 228, 231, 237, 264–65
- excitation, 36–38, 48, 50, 161–64, 166–68, 171, 191, 193, 195–200, 202, 212–13, 232, 234, 245, 248
 - optical, 46
 - photo-carrier, 24
 - pump, 47
- excitation laser, 159, 165, 197, 228, 237–38, 241, 244–45, 257, 259
- reflected, 237
- two-photon laser, 178

- excitons, 2, 6–7, 9, 36–37, 45, 48–49, 155–56, 158–59, 166, 168, 178–80, 182, 211, 213, 229
 - bound, 7, 48
 - charged, 2, 48, 169, 182
 - localised, 7
 - semiconductor, 10
- Fabry–Perot cavity, 107, 112, 212
- Fabry–Perot resonance, 71
- far-field radiations, 240, 247, 250, 256
 - polarisation-dependent, 255
- FDTD, *see* finite-difference time-domain
- Fermi–Dirac distribution, 46–47
- Fermi level, 27, 170, 174, 225, 257
- Fermi’s golden rule, 242
- Fermi velocity, 27
- FET, *see* field-effect transistor
- FIB, *see* focused ion beam
- fibre lasers, 96, 101–3, 106–8, 111, 115, 118–19, 122–23, 125–27
- field-effect transistor (FETs), 6–7, 178–79
- finite-difference time-domain (FDTD), 161, 218
- focused ion beam (FIB), 73–74, 85
- four-wave mixing (FWM), 210, 228, 257, 260
- Fresnel lens, 12
- FWM, *see* four-wave mixings
- gain, 103, 127
- GaP-PPC cavity, 237, 243, 248, 250, 255
- GaSe-PPC cavity, 260, 263
- Gaussian beam, 248
- Gaussian modes, 234, 240
- Gaussian spatial modes, 234
- graphene, 2–7, 23–28, 30, 32, 37–40, 46–48, 53–54, 85–87, 94–109, 111–14, 127–29, 209–12, 215–23, 225–28, 231–41, 255–60
- graphene-based saturable absorber (GSA), 96, 101–3, 106–8, 112, 123
- graphene-PPC cavity, 231, 233, 237–38, 258–60
- gratings, 2–3, 11–13, 67–68, 70, 72, 74, 76, 78, 80, 82–90, 92, 197–99, 201–2, 223, 249
- GSA, *see* graphene-based saturable absorber
- harmonic wave, 107, 128
- heterostructures, 8, 10–11, 89, 129, 162, 182, 204, 210, 256
- high-resolution microscopy, 260
- hybrid systems, 169, 191–92, 227
- intrinsic losses, 221, 223, 236, 250
- inversion symmetry, 28, 40, 152, 157, 177–78, 210
- Kelly sidebands, 111, 125
- Kerr coefficient, 260
- Kerr lens mode, 108
- Kerr non-linearity, 260
- Landau equation, 107
- laser diode (LD), 102, 112, 119, 126, 211, 261
- lasers, 8–10, 38–40, 45, 50–51, 53–56, 93–96, 100–103, 106–8, 112–14, 116–17, 120–29, 163–66, 238–39, 259, 261–62
 - fast, 128
 - narrow-band, 223, 237
 - polariton, 182
 - super-continuum, 232

- lasing, 161, 189, 251–52, 254
- lattice structures, 29, 35, 54, 174
- layered materials, 67, 94–95, 97–99, 122, 127
- layer numbers, 4–5, 7, 28, 30–31, 33–43, 45, 68, 70–71, 73–75, 90, 153, 158, 178, 210, 215
- LD, *see* laser diode
- leaky modes, 198, 246
- LEDs, *see* light-emitting devices
- light absorption, 35, 45, 154–56, 159, 161, 166, 171–72, 182, 213, 218–19, 225, 240, 257, 259, 265
- light emissions, 8–9, 158, 161, 166, 187, 191, 211–12, 216, 224, 231, 250, 254
- light-emitting devices (LEDs), 3, 157, 159, 213, 254–55
- light–matter interactions, 188, 197, 210–13, 218, 221, 224, 264
 - efficient, 216
 - enhanced, 212, 214, 216, 219, 224, 231–32
 - in-plane, 264
 - micro-ring-enhanced, 227
 - strengthen, 211
 - strong, 212–13
- light scattering, 82–83, 89
- liquid-phase exfoliation (LPE), 96, 104–5, 108–10, 112, 123, 125
- localised plasmon resonance (LPR), 191, 193, 195
- Lorentzian curves, 239
- Lorentzian fittings, 229, 239
- Lorentzian functions, 232, 248
- Lorentzian lines, 239, 247
- losses, 101, 115, 182, 189, 225, 227, 230, 235
 - bending, 226–27
 - bending radiation, 225
 - graphene-induced, 236
 - high damping, 190
 - insertion, 218
 - low transmission, 217
 - negligible scattering, 227
 - non-linear, 259, 265
 - nonsaturable, 127
 - optical, 101, 127
 - saturable, 125
 - strong Ohmic, 212
- low-threshold micro-lasers, 217
- low-threshold monolayer laser, 251
- LPE, *see* liquid-phase exfoliation
- LPR, *see* localised plasmon resonance
- Mach–Zehnder interferometer (MZI), 221–23
- Maxwell’s equations, 83, 240
- metal nanoparticles, 190, 203
- metal nanostructures, 173, 212
- micro-cavities, 8–9, 182, 188
- micro-ring resonators, 216, 224, 228, 264
- micro-rings, 216–17, 224–30, 264
- miniaturisation, 6, 11, 67, 90
- mode-locked lasers, 98, 103–11, 113, 118–19, 125–26
- mode-locking, 94, 106–8, 112–14, 122, 127
- modulation, 7, 94, 96, 101, 103, 111, 113, 115–18, 120–22, 211, 235–36, 255
 - effective, 102
 - effective optical, 108
 - gate-controlled, 180
 - passive optical, 129
 - pulsed laser, 96
- monolayer graphene, 111, 113, 210–13, 216–18, 223, 227, 229, 233, 235–36, 255
- monolayer MoS₂, 97, 154, 158–61, 169–70, 173–74, 192, 212, 228–30, 242–45, 250, 261
- monolayer MoSe₂, 192–93, 195–96

- monolayer WSe₂, 49, 154, 156, 160–62, 172–73, 178, 180, 200, 202, 242, 248, 252, 255–56
- MoS₂, 5–6, 28, 41, 68–75, 83–85, 97–98, 122, 156–59, 166–67, 169–70, 172–74, 180–81, 210–11, 228–29, 243–46
 - bowtie, 162
 - cavity-coupled, 246
 - exfoliated, 243
 - few-layer, 82
 - semiconductor, 9
 - single, 115
 - thin, 74, 81, 210
- MoS₂ gratings, 82, 84, 86–89
- MoS₂ micro-lens, 73–76, 78, 80–82
- MoS₂ monolayers, 34, 49, 160, 167, 169, 180–81, 228–29, 242–44
- MZI, *see* Mach–Zehnder interferometer

- nanocavities, 9–10, 151, 159, 167, 171–72
- nanostructures, 9, 161–62, 164, 166–67, 181
 - artificial, 2
 - fabricated, 10
 - gold plasmonics, 161
 - hybrid, 174
 - metallic, 167, 171–72
 - patterning, 159
- non-linear processes, 216, 224, 231, 257–58, 265
 - cavity-enhanced, 258
 - low-power, 211
 - second-order, 211, 260, 262

- on-chip devices, 3, 14, 213, 264
- on-chip nanophotonic devices, 213–14
- on-chip photonic structures, 216
- on-resonance, 211, 228, 235, 240, 247, 262

- OPL, *see* optical path length
- optical absorption, 94, 99, 101, 106, 157, 210, 221, 228, 231, 240
 - independent, 102
 - intrinsic, 212
 - large non-linear, 95
 - linear, 99, 123, 125
 - micro-ring-enhanced, 224–25
 - strong, 163, 228
- optical bistability, 257–59
- optical cavities, 159, 180, 212, 233, 242, 250
- optical components, 2, 11, 89–90
- optical devices, 3, 6, 99, 124, 179, 250
- optical fields, 166, 176, 180, 190, 212–13, 216, 219, 221, 224–25, 257, 259, 262, 264
 - confined, 261
 - enhanced, 262
 - stronger localised, 224
 - weaker localised, 264
- optical interconnects, 214–16, 231–32, 253
 - chip-integrated, 224
 - multi-functionalised, 214
- optical microscopy, 12, 30
- optical path length (OPL), 68–75, 176, 224
- optical properties, 2–3, 8, 10, 13, 23, 30, 33, 35, 37, 45, 48, 56, 124–25, 129, 152, 156, 158, 175, 177–78, 182, 204, 209–10
- optical responses, 13, 68, 94–95, 99, 101, 103, 108, 125, 157, 210–11, 216–17, 224, 228, 237, 265
- optical susceptibility, 175
 - linear, 175
 - second-order non-linear, 175
 - third-order non-linear, 176
- optoelectronics, 24, 45, 47, 56, 89, 151, 153, 175, 213

- Pauli blocking, 211, 257
- PC, *see* polarisation controller
- phase-shifting interferometer (PSI), 68–71, 73–74, 90
- phonon modes, 4, 38, 40–41, 43, 172
- phonons, 1, 33, 38, 40, 45–48, 171–72, 259
- phosphorene, 2–3, 6–7, 14, 30–31, 35–37, 43–45, 54–56, 182
- photo-detectors, 67, 151, 153, 213–15, 217, 223, 236, 264
 - graphene-integrated, 218
 - high-performance, 214
 - high-response, 217
 - high-responsivity, 10
 - integrated graphene, 212
 - up-conversion, 211
- photo-luminescence (PL), 1–2, 6, 8, 33–37, 48–49, 52–53, 152, 154–55, 157–59, 161–73, 180–82, 188, 190–200, 228–29, 242–54
- photo-multiplier tube (PMT), 262
- photonic crystal cavities, 10, 180, 188, 190–91, 197, 216–17, 224, 231, 237, 242, 257
- photonic crystal nanocavities, 216
- photonic crystals, 2–3, 160, 213, 240
- photonic devices, 213–15, 224, 228, 264
- photonic forbidden band, 230, 244, 248
- photonic nanostructures, 151, 187–88, 190–92, 194, 196, 198, 200, 202–4, 206, 208
- photonics, 3, 33, 93–94, 99, 125, 230, 244, 248, 264
- photonic structures, 159, 188, 191, 197, 204, 213, 216, 225
- photons, 1, 38, 51, 155, 172, 180, 192, 216, 236, 257
- PL, *see* photo-luminescence
- planar photonic crystal (PPC), 230–31, 237, 244, 246, 248–50, 253–54, 256–58, 263
- plasmonic nanostructures, 8–9, 151, 158–59, 161–62, 166–69, 173, 182, 197
- plasmonic resonance, 13, 68, 192–94, 196
- plasmons, 161, 163, 165–66, 190
- PMT, *see* photo-multiplier tube
- polarisation, 35, 37, 42, 44–45, 50, 99–100, 163, 165–66, 175–76, 188–89, 191, 193, 195, 220–21, 239, 241–42, 245–48, 251, 253–55
 - even-order, 177
 - linear, 180
 - non-linear, 176
 - second-harmonic, 177
 - strong, 83, 99, 255
 - valley, 188
- polarisation controller (PC), 102, 119, 126, 214, 246–47
- polyvinyl alcohol (PVA), 95, 100, 104, 109, 115–16, 119–21
- PPC, *see* planar photonic crystal
- PPC cavities, 230–33, 235–38, 240–46, 248–55, 257–58, 261–65
- propagation losses, 216, 219–22, 227
- PSI, *see* phase-shifting interferometer
- pulsed laser, 94–95, 100–101, 115, 122, 124–25, 176, 254, 261
- pump laser, 162, 164–65, 179–80, 211, 248, 258, 261–62, 265
- Purcell effect, 159–60, 168, 189, 191, 242, 245, 247
- Purcell factor, 160, 163–64, 172, 189
- PVA, *see* polyvinyl alcohol

- Q-switched laser, 102
- Q-switched solid-state laser, 118
- quantum confinement, 152
- quantum yield, 33–34, 169, 195–96, 249–50, 254, 264
- quasi-particle, 2
- quenching, 9, 168–69, 192, 195–96

- radiation, 166, 175–76, 191, 202, 242
 - coherent light, 9–10
 - high-intensity, 210
 - second-harmonic, 179
- Raman-active modes, 40, 43
- Raman bands, 241
- Raman effect, 1
- Raman frequency, 38
- Raman intensities, 173
- Raman modes, 173
- Raman peaks, 40, 43–45, 169, 238–39
- Raman scattering, 38, 152, 154, 171–73, 216, 231, 237–38, 241–42, 264–65
- Raman spectra, 4, 37–44, 54, 165–66, 169–70, 172–74, 237–38
- Raman tensor, 41
- RCWA, *see* rigorous coupled wave analysis
- reflection spectra, 50, 226, 232–33, 235, 237–38, 248
- refractive index, 2, 68, 70–72, 81–84, 89, 107, 191, 193, 214–15, 218–19, 225, 230, 236, 240, 247
- resonance, 33, 94, 156, 161, 178–79, 189, 198, 204, 224, 227, 235, 246, 260, 262
 - double, 39
 - excitonic, 210
 - fundamental, 262
 - large, 259
 - multiple, 161, 191, 197–98
 - multiple propagating mode, 197
 - single, 192
 - triple, 39
- resonators, 189–90, 213–14, 230, 259, 264
 - bare micro-ring, 225
 - optical, 123, 180, 216
- rigorous coupled wave analysis (RCWA), 84
- ring resonators, 106, 216, 229, 236
 - optical, 189

- SAM, *see* saturable absorber mirror
- SA, *see* saturable absorber
- saturable absorber (SA), 94–96, 98–105, 109–10, 114–15, 118, 123, 126–28
- saturable absorber mirror (SAM), 94, 96, 102, 108, 114, 123
- saturable absorption, 98, 100, 122
- scanning electron microscopy (SEM), 12, 223
- scattering, 38, 46–47, 68, 82–84, 86, 95, 158, 161, 217, 232, 240, 242, 244
- Schottky barrier, 169, 192
- Schottky junctions, 210
- second harmonic generation (SHG), 3, 152, 154–55, 157–58, 166, 175–82, 188, 210–11, 260–63, 265
- second-order non-linearity, 178, 211, 260–61, 265
- second-order non-linear susceptibility, measured, 176, 211, 265
- SEM, *see* scanning electron microscopy
- semiconductors, 2–6, 8–11, 13–14, 45–46, 50, 89, 94, 96, 100, 103, 112–13, 127–28, 182, 250, 252
- bulk, 264
- complementary metal-oxide, 214

- direct, 97
- indirect, 97
- indirect-bandgap, 28, 153
- layered, 98
- quasi-2D, 156
- wide-bandgap, 228
- zero-bandgap, 3
- semiconductor saturable absorber mirror (SESAM), 94, 108
- SESAM, *see* semiconductor saturable absorber mirror
- SFG, *see* sum frequency generation
- SHG, *see* second harmonic generation
- side-polished fibre (SPF), 114, 118, 122
- silicon nanophotonic devices, 265
- silicon-on-insulator wafer, 223
- silicon photonic crystal, 180–81
- silicon photonics, 188, 197, 214, 253, 259
- SiO₂/Si substrate, 32, 69, 73, 79–81, 85, 167
- solar cells, 47, 82, 98
- solid-state lasers, 103, 108, 115, 122, 127
- spacer, 166, 193–96
- spectroscopy, 45, 93, 231
 - angle-resolved photo-emission, 27
 - optical, 178
 - optical pump-probe, 46–47
 - optical-pump terahertz-probe, 47–48
 - polarised white-light, 193
 - time-resolved, 95
 - transient reflection, 50
- SPF, *see* side-polished fibre
- spontaneous emission, 9, 161, 189, 226, 242
- SPP, *see* surface plasmon polariton
- sub-wavelength gratings (SWGs), 12
- sum frequency generation (SFG), 176
- surface plasmon polariton (SPP), 166, 212
- surface plasmons, 167, 169, 173
- SWGs, *see* sub-wavelength gratings
- TDF, *see* thulium-doped fibre
- THDF, *see* thulium-holmium-co-doped fibre
- THG, *see* third harmonic generation
- third harmonic generation (THG), 210, 263, 265
- third-order non-linearity, 210, 257, 259–60, 265
- thulium-doped fibre (TDF), 105–6
- thulium-holmium-co-doped fibre (THDF), 105–6, 123
- time-resolved photo-luminescence (TRPL), 45–46, 48–49
- TMD, *see* transition metal dichalcogenide
 - atomic, 210
 - bulk, 40, 153
 - few-layer, 178
 - group VI, 28
 - large-bandgap, 7
 - large-gap, 99
 - layered, 97
 - mid-bandgap, 14
 - monolayer, 28, 33, 41, 48, 97, 152, 155, 158–59, 172, 178–79, 188–89, 242, 248, 250–51, 254–55
 - thin, 213
 - thin-layer, 2
- transition metal dichalcogenide (TMD), 2–3, 5–6, 23–25, 32–34, 40–43, 97–98, 114–15, 117–19, 121–22, 151–59, 167–69, 171–73, 175, 177–82, 187–89

- trenches, 161, 163, 165–66, 243–44
- TRPL, *see* time-resolved photoluminescence
- two-photon absorption saturation, 98, 128
- ultra-fast lasers, 3, 128
- ultra-fast spectroscopies, 45
- ultra-thin photo-emitters, 151
- valence band, 11, 25, 30, 32–33, 95, 155, 158
- valence band maximum (VBM), 28, 30, 35, 153, 172
- van der Waals forces, 6, 188, 210
- van der Waals heterostructures, 182
- van der Waals interaction, 5, 97
- van der Waals structures, 40
- van Hove singularities (VHS), 155
- VBM, *see* valence band maximum
- VECSEL, *see* vertical external cavity surface emitting laser
- vertical external cavity surface emitting laser (VECSEL), 112–13
- VHS, *see* van Hove singularities
- vibrational property, 23, 37, 39–41, 43
- waveguide lasers, 112, 115, 123–24
- waveguides, 2, 96, 102–3, 112, 114, 124, 127, 197–98, 202, 213, 216–27, 233–36, 264
- bare, 222
- high-quality, 218
- hybrid, 219
- low-loss, 214
- photonic, 217, 220, 224
- tunnelling, 233–34
- wavelength division multiplexer (WDM), 102, 119, 126
- wavelength, 70–73, 104–6, 109–11, 115–17, 120–21, 123, 125–28, 156–58, 163–64, 220–21, 230, 237–39, 245, 260–61, 265
- central, 112, 122
- cubic, 257
- fixed, 178
- free-space, 191
- infrared, 108, 123, 228
- mid-infrared, 128
- optical, 115
- resonance, 160
- technical, 106
- telecommunication, 180
- transparent, 253
- ultra-violet, 251
- WDM, *see* wavelength division multiplexer
- Wigner-Weisskopf approximation, 242
- WS₂, 8–9, 11, 24, 34, 41, 89–90, 97–98, 117, 119, 151, 157–58
- WSe₂, 9, 13, 53–54, 89–90, 97–98, 151, 153, 157–58, 160–61, 163–66, 180–81, 197–203, 211, 248–52, 255–56
- XPS, *see* X-ray photoelectron spectroscopy
- X-ray photoelectron spectroscopy (XPS), 54–55
- YAG, 108–10, 121, 124
- YDF, *see* ytterbium-doped fibre
- YGG lasers, 115, 118
- Young's modulus, 4, 6–7
- ytterbium-doped fibre (YDF), 106, 122
- zero-index metamaterials, 177
- zero-bandgap graphene, 2, 6–7

Two-dimensional (2D) crystalline materials, which consist of a single layer or a few layers of atoms, have attracted tremendous interest since the study of graphene in the early 21st century. With their angstrom-to-nanometer thickness, large surface-to-volume ratio and reduced dielectric screening, 2D materials (including graphene, phosphorene, transition metal dichalcogenides, silicene and other inorganic and organic materials) can be an ideal platform to study fundamental many-body interactions because of reduced screening and can also be further engineered for nanophotonic applications.

This book compiles research outcomes of leading groups in the field of 2D materials for nanophotonic physics and devices. It describes research advances in 2D materials for various nanophotonic applications (e.g., ultrafast lasers, atomically thin optical lenses and gratings to inelastically manipulate light propagation), their integration with photonic nanostructures and light–matter interactions. The book focuses on actual applications, while digging into the physics underneath. It targets advanced undergraduate- and graduate-level students of nanotechnology and researchers in nanotechnology, physics and chemistry, especially those with an interest in 2D materials.



Yuerui Lu is associate professor at the Research School of Engineering, College of Engineering and Computer Science, Australian National University (ANU), Australia, where he is leading the Nano-Electro-Mechanical System Lab. He received his BS from the Department of Applied Physics, University of Science and Technology of China and PhD from the School of Electrical and Computer Engineering, Cornell University, New York. In 2013, he joined the ANU as a research fellow and lecturer under the Future Engineering Research Leadership Fellowship, and in 2016, he was promoted to associate professor. He has received a few prestigious awards, including the Discovery Early Career Research Award from the Australian Research Council in 2014 and the Media and Outreach Award from the ANU in 2015. He is a reviewer for several prestigious journals, such as *Nature*, *PNAS* and *Advanced Materials*, and an associate editor for *Scientific Reports*. Prof. Yu's research interests include MEMS/NEMS sensors and actuators, nanomanufacturing technologies, renewable energy harvesting, biomedical novel devices, nanomaterials and nanoelectronics.



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