# Index


’quantum’ display, 491

3D TV, 169, 591

3D cinema, 591

3D media encoding, 675

, 384

A/D conversion, 329

aberration, 114

absolute optical systems, 113

absorption, 101

accommodation, 142

accommodation, active steering by-, 732

accommodation, near-eye displays, 728

accomodation, 175

acoustic pulse recognition, 373

active cross-talk reduction, 599

active matrix displays, 359

active shuttering, 615

active stereo-channel separation, 598

adaptive de-interlacing, 346

adaptive holographic display, 665

adaptive light field displays, 647

additive color mixing, 315

aliasing, 337

ALIS, 445

alternate lighting of surfaces, 445

amplitude gratings, 263

amplitude hologram, 207

amplitude holograms, 263

anaglyph rendering, 830
anaglyph stereo-channel separation, 600
analog-to-digital conversion, 329
anamorphic, 289
anamorphic pictures, 289
angle to position converter, 637
angular density, 39, 41
angular range, 39, 306
angular resolution, 287
angular response, 235, 307
anti-aliasing, 337, 804
anti-reflective coating, 368
aperture, 125
aperture plane, 126
AR, 689
arc lamps, 32
aremac, 777
aspect ratio, 469
aspheric, 120
aspheric lenses, 120
ATI Stream, 812
augmented reality, 689, 703
auto holographic display, 665
auto-iris projector, 555
autostereoscopic displays, 618
AVC, 345

back focal plane, 122
back focal point, 122
backlighting, 367
banding, 335
bands, 351
barrel distortion, 837
barrier, 619
barrier displays, 619
barrier pitch, 620
beam combiner, 742
beam deflection, 495, 500
beam diverter, 242
beam splitter, 242
beat, 95
Bell experiment, 60
benable electronics, 382
Bessel filters, 327
bi-directional displays, 460, 767
bi-directional touch screens, 376

bi-stable LCD, 407
BIEP, 517
binary Fraunhofer holograms, 204
binary image exposure sequence, 517
binocular field, 170
birefringence, 79
black level, 302
bleaching, 208
blurring effect, 178
Bohr atomic model, 51
Bohr radius, 52
Boltzmann, 17, 69
Bragg condition, 263
Bragg diffraction, 262
Bragg grating, 211
Bragg's law, 218
Bragg's law - color dependency, 219
bremsstrahlung, 26
Brewster's angle, 107
brightness, 301
brightness range, 145
brightness, near-eye displays, 696
burn-in effect, 446
burst, 319
burst sugnal, 319

C for Graphics, 809
calcspar, 79
calibration, 653
capacitive touch panel, 380
carbon nanotubes, 385
cathode ray tubes, 433
CAVE, 613
Cave Automatic Virtual Environment, 613
Cg, 809, 810
CGH, 656
chemo luminescence, 35
chiral nematic, 407
cholesteric LC, 396, 407
chromatic aberrations, 120
chromaticity diagram, 157
CIE, 153
CIE chromaticity diagram., 157
CIE color matching functions, 155
CIE UCS, 159
CIE Uniform Color Space, 159

circular polarization, 78, 606
CMOS, 361
co-axial projector-camera system, 531, 552
coded aperture projection, 555
coded apertures, 555
coherence, 88, 223
coherent light, 88, 254
cold cathode tubes, 453
cold light mirror, 467
collimated display, 230, 490, 713
collimated near-eye displays, 713
color anaglyphs, 602
color as depth cue, 179
color bar, 324
color dispersion, 105, 210
color filters, 320
color gamut, 311
color look-up tables, 836
color matching functions, 155
color mixing, 525
color mixing matrix, 525
color perception, 152
color recording, 161
color space conversion, 833
color temperature, 24
color transformations, 156
color wheel, 479
colorimetry, 151
comb filtering, 339
combiner mirror, 742
computed holograms, 656
computer generated holograms, 580
computer-generated holograms, 656
concave mirror, 116
concave parabolic mirror, 117, 118
concentric mirrors, 725
condenser, 464
cones, 142
conjugate beam, 256
connection, 356
contact lens display, 749
contrast, 539
contrast (displays), 302
contrast (perception), 145
contrast ratio, 564

convergence, 170, 173
converging lens, 122
convex mirror, 116
convex parabolic mirror, 118
convolution, 839
convolution filter, 340
critical anlge, 111
cross-correlation, 67
cross-talk, 599
CRT, 433
CRT projector, 474
CUDA, 797, 811
curved parallel lens, 125
cylinder lens array, 647

D-ILA, 406
D/A conversion, 334
DCT, 342
de Broglie wavelength, 52
de-interlacing, 345
de-noising, 341
deconvolution, 554
deflection, 440, 500
Denisyuk holograms, 264
dependent texture lookups, 826
depth cues , 171
depth of field, 125, 134, 655
depth of field, projector-camera systems, 552
depth of focus, 125, 134
depth perception, 168
depth perception, stereoscopic displays, 584
depth queues, 256
dichroic combiners, 481
dichroic mirror, 743
diffraction, 86
diffraction based holography, 647
diffraction grating, 87, 255
diffraction modes, 203
diffraction orders, 203
diffraction specific holography, 661
diffuse and bright (DAB) screens, 608
DigiLens, 427
digital holograms, 276
digital light processing, 479
digital volumetric holograms, 280

digital-to-analog conversion, 334
diplopia, 169
dipvergence, 589
Dirac pulse, 330
Dirac pulse series, 330
DirectX, 809
DirectX Compute Shaders, 812
discrete cosine transform, 342
disparity, 169, 173
disparity gradient, 175
disparity mapping, 587
disparity range, 174
dispersion, 105
dispersive signal technology, 374
display gamut, 159, 311
display holograms, 254
display, DLP, 411
display, DMD, 411
displays, electrochromic, 422
displays, F-LCOS, 405
displays, FLC, 401
displays, GLV, 420
displays, laser, 494
displays, LCD, 394
displays, LCOS, 404
displays, LED, 448
displays, OLED, 448
displays, performance, 502
displays, plasma, 444
displays, polymer, 422
displays, TMOS, 401
displays, transflective, 430
displays, transparent OLED, 452
distributed Bragg reflector, 214
divergence, 170
diverging lens, 124
DivX, 345
DLP, 411
DLP projector, 479
DMD, 411, 761
DMD driving, 414
doping, 351
Doppler effect, 31
double modulation, 457, 539
double slit experiment, 55
double vision, 169

dual modulation, 457
duality hypothesis, 56
durability, 48
dyed guest host displays, 402
dynamic image liearization, 771
dynamic range, 564
dynamic range (displays), 302
dynamic range (perception), 145

E-ink, 422
earth temperature, 21
effective aperture, 466
eidophor projector , 480
Einstein, 19
EL displays, 447
elastic light scattering, 102
elastic scattering, 102
electro luminescence, 33, 36
electrofluidic, 425
electroluminescence displays, 447
electromagnetic field equations, 9
electromagnetic radiation, 9
electromagnetic waves, 9
electron excitation, 29
electronic paper, 428
electrovibration, 381
electrowetting, 425
elliptic polarization, 78
embedded imperceptible pattern projection, 517
embossed hologram, 210
embossed holograms, 260
emissive displays, 323, 433
emissive projector, 463
emissive projectors, 474
energy level transition, 29
entrance pupil, 127
epiretinal implants, 793
excitation, 29
excitation (electron), 30
exit pupil, 127, 713
exit pupil (laser scanners), 722
exit pupil, optical see-through, 713
eye, 142
eye resolution, 149
eye resolution curve, 726
eye tracker, 693

eye tracking, 755, 757
eye, neuro-physiological data, 164
eye-tracking, 625
eyetap, 776

F-LCOS, 405
far-field laser projectors, 496
far-field scanner, 495
fata morgana, 109
FBO, 822
FED, 441
Fermat's principle, 113
ferroelectric LC, 401
field emission displays, 441
field of view, 693
fill factor, 338
film projection, 187
FireStream, 808
first reflection theorem, 111
first refraction theorem, 110
fixed point (of a function), 331
flashing backlight displays, 400
FLC, 401
flexible displays, 382
flexible electronics, 382
flicker fusion rate, 144
flicker fusion threshold, 598
fluorescence, 33
fluorescent lamps, 35
focal distance, 116
focal length, 116
focal point, 116
focus effects, 178
focus range, 175
focus, near-eye displays, 728
force detection, 373
force sensors, 373
formats, computer display, 290
formats, TV, 294
Fourier hologram, 661, 663
Fourier holographic projector, 482
Fourier transform, 66
Fourier transform (of Dirac series), 333
fovea, 146
fragment shader, 805
fragment shading, 830, 833, 837, 839

fragments, 803
frame buffer object, 822
frame-locking, 614
Fraunhofer holograms, 204
Fresnel equations, 106
Fresnel lens, 130
fringe pattern, 255
fringe patterns, 193
fringelet, 662
front focal plane, 122
front focal point, 122
full frame, 348
full parallax, 622
full parallax (FP) stereogram, 277

Gabor, 190
gamma, 304
gamma compression, 304
gamma expansion, 304
gamut, 159
gas discharge, 31
Gaussian beam, 97
Gaussian filter, 839
gen-locking, 614
general purpose computations, 811
general purpose GPU, 808
general purpose programming languages, 811
Genoa, 313
geometric aberrations, 120
geometric optics, 100
geometric projector-camera registration, 509
geometric registration, 509
geometric registration, projector-camera systems, 509
geometric scattering, 102
geometry pattern, 324
geometry shader, 805
geometry shading, 828
ghost objects, 732
ghosting, 599
GLSL, 797, 806, 809
GLV projector, 479
GPGPU, 808, 811
GPU, 797
graphics hardware units, 797

grating deflection mirror, 735
grating equation, 203
grating light valve, 420
grating light valve projector, 479
gray anaglyphs, 601
greenhouse effect, 22

h.264, 345
H.264 coding, 678
half frame, 348
half-color anaglyphs, 602
haze, 179
HDR, 454, 564
HDTV, 294
head tilting, 583
head-tracking, 612, 625
headup displays, 230
Heisenberg, 62
HID lamps, 471
high dynamic range, 564
high dynamic range displays, 454
High Level Shading Language, 809
high speed projector-camera systems, 570
high speed, projector-camera systems, 570
high-intensity discharge lamps, 471
hight dynamic range, projectors, 564
histogram calculations, 828
HLSL, 809
HOE, 229
HOE characteristics, 235
HOE constructions, 232
HOE lenses, 237
HOE, switched, 427
hogel, 662
hologram decoding, 681
hologram efficiency, 220
hologram photography, 197
hologram resolution, 222
hologram synthesis, 656, 658
holographic combiners, 746
holographic encoding, 679
holographic filming, 579
holographic image formation, 257
holographic laser projectors, 484
holographic optical elements, 229

holographic optics, near-eye displays, 740
holographic printers, 278
holographic projection screen, 243
holographic projection screens, 608
holographic scanners, 735
holographic scene encoding, 679
holographic stereograms, 276, 580
holographic sterepgrams, 618
homography, 510
homography matrix, 510, 824
homography transformation, 824
homography warping, 824
horizontal parallax only, 619
horizontal parallax only (HPO), 266
horizontal parallax only (HPO) stereogram, 277
horizontal-parallax-only, 648
horopter, 171
horseshoe diagram, 158
hot spot, 486
Hough transform, 758
HPO, 619, 648
HSV color space conversion, 833
HUD, 230
human eye, 142
human visual field, 170
hyper elasticity, 413

illumination path, 465
illumination path offset, 471
illumination rays, 465
image array encoding, 677
image beam, 255
image compensation, 755
image compression, 342
image undistortion, 837
image-based rendering, 644
image-space telecentric, 128
imaging path, 465
imaging rays, 465
immediate mode, 799
iMOD display, 426
imperceptible patterns, 517
impulse scatter function, 542
index color CRT, 438
index modulation, 427

inductive touch panels, 381
inelastic light scattering, 102
inelastic scattering, 102
information theory, 62
inlay images, 725
integral images, 277
integrator rod, 469
interference pattern, 87
interference patterns, 199, 254
interferometric modulator display, 426
interlacing, 291
International Commission on Illumination, 153
interocular distance, 169, 173
interreflection cancellation operator, 542
interreflection compensation, 826
interreflections ,projector-camera systems, 541
inverse light transport, projector-camera systems, 546
inverse pulldown, 349
iris, 142
iris aperture, 126
ITO, 377

JND, 148
JPEG, 345
just noticeable difference, 148

keyhole hologram, 253
Kirchhoff, 15

Lambert emitter, 308
Lambert emitters, 39
Larrabee, 808
laser beam deflection, 500, 727
laser beam divergence, 96
laser diode, 93, 722
laser displays, 494
laser displays, near-eye displays, 717
laser induced breakdown, 636
laser projectors, 411, 494
laser sources, 90
laser transmission hologram, 260
lasers, 90
LCD, 394
LCD projector , 477
LCOS, 404

LCOS projector, 405
LED, 36, 448
left-circular polarization, 78
lens resolution, 131
lens shift, 470
lenses, 120
lenticular displays, 619, 621
licker fusion threshold, 144
light field, 136, 279, 591, 594, 637
light field - hologram transform, 642
light field camera, 766
light field display, 594, 625
light field displays, 637
light field focus rendering, 654
light field image encoding, 676
light grid, 375
light guide, 367
light intensity, 694
light modulation, 101
light scattering, 102
light sources, 322
light transport, projector-camera systems, 546
light valve, 464
light valve displays, 323
light valve projector, 463
light waves, 254
lighting path, 465
lighting rays, 465
linear polarization, 605
liquid lens, 129
Lissajous, 500
luminance curve, 156
luminescent displays, 315, 323
luminous efficacy, 46
luminous efficiency, 46

macular degeneration, 792
mask display, 778, 779
mask display technologies, 787
master hologram, 267
matrix displays, 358
Maxwell, 9
McAdam ellipses, 159
mechanical vignetting, 129
MEMS, 418
MEMS scanner, 718

MEMS scanners, 497
metal halide lamps, 471
metal-oxide field effect transistor, 353
micro display, 404
micro displays, near-eye displays, 698
micro electro mechanical displays, 418
micro motors, 772
micro projectors, 462
micro raster scanners, 497
micro-electro-mechanical systems, 497
micropolarizers, 606
microsaccades, 144
MID, 382
middle gray, 784
Mie scattering, 102
millimeter wave hologram, 680
MLM, 420
mobile projectors, 577
modulation of light, 101
moiré, 338
molded interconnect device, 382
monochromatic, 88
monochromatic light, 88
monocular field, 170
Moore's law, 807
MOSFET, 353
motion dynamics, 183
motion parallax, 180
motion pictures, 185
motion vectors, 166, 346
moving liquid mirror, 420
MPEG, 345
multi color displays, 313
multi exposure true-color holograms, 270
multi-channel hologram, 273
multi-focal lens, 731
multi-layer coating, 369
multi-pass rendering, 824
multi-plane screen configurations, 612
multi-sided screen configurations, 613
multi-texture calculations, 807
multi-view displays, 631
multi-view encoding, 677
multi-viewer stereo, 615
multi-viewer support, autostereoscopic

displays, 628
multiplexed autostereoscopic display, 626
multiplexing, 356

natural vignetting, 129
near field scanner, 495
near-eye displays, display technologies, 698
negative disparity, 586
nematic crystals, 394
nixie tubes, 453
noise, 195, 336
noise figures, 336
noise reduction, 288, 341
non-locality, 60
NTSC, 294, 441
numerical aperture, 127
Nyquist/Shannon theorem, 329

object beam, 193, 254
object wavefront, 193
object-space telecentric, 128
off-axis projection, 610
OLED, 37, 448
OLED on CMOS, 452
OLED projector, 474
OLED-on-CMOS, 767
one chip eye tracker, 767
Open Computing Language, 812
OpenCL, 797, 812
OpenCV, 839
OpenGL, 797
OpenGL Shading Language, 809
OpenGL, fixed function graphics pipeline, 799
optical aberration, 114
optical compensation, 775
optical distortion, 257
optical holography, 254
optical imaging, 375
optical see-through, 703
optical vignetting, 129
optics for near eye displays, 701
optimized anaglyphs, 603
orthoscopic, 257
orthoscopic image, 257

PAL, 294, 441

PALC, 362
panel construction, 366
Panum's fusion area, 174
parabolic mirrors, 117
parallax barrier displays, 619
parallax displays, 277, 619
particle metaphor, 61
passive cross-talk reduction, 599
passive matrix displays, 356
passive stereo-channel separation, 598
PDLC, 427, 486, 609
perceived brightness, 44
perceived contrast, 147
percolation, 378
Performance comparison (displays), 502
permeability, 103
permittivity, 103
personal information displays, 702
personal video displays, 701
perspective distortion, stereoscopic displays, 589
phantom array effect, 145
phase array, 751
phase dispersed liquid crystal, 486
phase dispersed liquid crystal screens, 609
phase grating, 263
phase hologram, 207, 208, 263
phase information, 676
phase shifting LCD, 407
phosphorescence, 33
phosphors, 33
photic field, 136
photo luminescence, 33
photo receptors, 142
photoelectric effect, 19
photometric emulsion, 254
photometric units (table), 45
photometry, 44
photon energy, 19
photopic vision, 44, 143
phototropic glass, 788, 790
piezo motors, 771, 772
pincushion distortion, 837
piston type MEMS display, 418

pixel displacement mapping, 515
pixel pitch, 620
pixel warping, 837
planar mirrors, 115
planar wavefront, 84
Planck, 17
plane of incidence, 110
plane parallel lense, 125
plasma, 444
plasma lamps, 32
plastic lenses, 121
plenoptic function, 135
PLM, 411
point source, 84
point spread function, 568
point spread functions, 553
polarization, 73
polarization filtering, 615
polarization, stereo-channel separation, 605
polarized reflection, 107
polarizer, 74
polarizer filter, 73
polymer, 422
polymer dispersed liquid crystal, 427
power consumption, near-eye displays, 696
primary colors, 155
print media, 604
printed displays, 389
prism, 105
private screen, 617
probability density function, 58
probability waves, 61
progressive frames, 348
projection displays, 461
projection lens, 464, 469
projection screens, 484
projective texture mapping, 512
projective textures, 512
projector lamps, 471
projector optics, 463
pseudo-color holograms, 269, 271
pseudoscopic, 257, 631
pseudoscopic image, 257
pseudoscopic images, 606

pseudoscopic impression, 621
PSF, 568
Pulfrich effect, 607
pulldown, 349
pulse length modulation, 411
pulse width modulation, 411, 722
pupil diameter, 694
pupil diameters, 149
pupil size, 782
purple colors, 158
PWM, 411, 722

quadric image transfer, 614
quantum computing, 62
quantum dot, 71
quantum effects, 50
quantum leap, 30
quantum physics, 19
quantum systems, 61
quantum tunneling composite, 378
quarter wave plate, 80
qubit, 63

rack focus effect, 178
radiation thermometer, 20
radiometric compensation, 521
radiometric compensation, projector-camera systems, 521
radiometric units (table), 42
radiometry, 38
rainbow effect, 145
rainbow holograms, 266
random hole display, 621
raster displays, 285
rasterization, 802
Rayleigh scattering, 102
Reactive Monomer Liquid Crystal Mix, 427
real image, 113, 256
real object, 113
rear projection , 486
reference beam, 193, 254
reference wavefront, 193
reflection hologram, 210, 212
Reflection holograms, 261
reflective optics, 114
refraction, 103
refractive optics, 119

refresh rate, 290
resistive panels, 376
resistive touch panels, 378
resizing, 340
resolution, 222, 285
resolution triangle, 324
retina, 142
retina receptors, 164
retina tracker, 757, 764
retina tracking, 764
retina, receptor density, 166
retinal disparity, 169, 173
retinal display, 717
retinal image processing, 166
retinal implant, 792
retinal prothese, 792
retinal rivalry, 602
retinitis pigmentosa, 792
retro-reflective materials, 485
retro-reflective screens, 485, 608
rhodopsin, 146
right-circular polarization, 78
RMLCM, 427
rods, 142
Roentgen, 26
rollout displays, 382
rotating HOE, 645

saccades, 143, 692
sampling theorem, 328
scanning backlights, 400
scatter compensation, 826
scattering, 102
scattering, , projector-camera systems, 541
Scheimpflug correction, 470
Schrödinger equation, 54
scotopic vision, 44, 143
screen-tearing, 799
second reflection theorem, 111
second refraction theorem, 110
SED, 441
self interference, 661
self-adaptation, 713
semi-immersive, 613
semiconductors, 350
sensitivity curves, 152

shader units, 807
shaders, 798, 804
shadow mask, 435
shape measurement, 256
shared screen space, 617
signal transmission, 326
silicon on polymer, 383
silk-screen, 389
silver screen, 485
single exposure true-color holograms, 269
single-beam holograms, 261
slanted sheet technique, 626
SLM, 222
Snell, 103
Snell's first reflection theorem, 111
Snell's first refraction theorem, 110
Snell's law of refraction, 106
Snell's second reflection theorem, 111
Snell's second refraction theorem, 110
sol-gel coating, 371
SOLED, 452
solid angle, 39, 41
spatial coherence, 226
spatial light modulator, 222, 241
spatial stereo-channel separation, 616
spatial stereoscopic displays, 596
speckle pattern, 228
speckles, 494
spectral locus, 158
spectral response, 236
spectrum, 10
specular reflection, , projector-camera systems, 545
Speed, 309
spherical mirror, 116
spherical wavefront, 84
static two-view displays, 631
static volume displays, 635
statistical mechanics, 17, 69
steps, 324
steradian, 41
stereo fusion, 587
stereo pair, 578
stereo picture recording, 184
stereo-channel separation, 597

stereoacuity, 174
stereopsis, 169
stereoscopic displays, 596
stigmatic pair, 112
stigmatism, 113
stimulated emission, 90
stretchable electronics, 382
subretinal implants, 792
subtractive color mixing, 316
super twisted nematic, 396
super-resolution, projector-camera systems, 558
surface capacitance, 379
surface emitters, 306
surface shape, 257
surface wave touch screen, 374
surface-conduction electron-emitter displays, 441
surround screen, 613
swept volume displays, 633
switched Bragg hologram, 427
switched HOE, 427
synchrotron radiation, 28
tactile feedback, 381
tactile feedback: touch panels, 381
tearing, 799
telecentric, 128
telecentric lens, 128
telecentric stop, 128
temporal coding, 519
temporal resolution, 290
temporal response, 144
Tesla, 808
test pictures, 324
texture combiners, 807
TFD, 361
TFT, 361
thermal camera, 20
thermal radiation, 13
thin film diod, 361
thin film interference, 88
thin film transistor, 361
three dimensional filtering, 342
threshold map, 538
throw ratio, 469
time sequential polarization, 607

time-sequential shuttering, 615
TMOS, 401
tonal resolution, 303, 335
total internal reflection, 111
touch screens, 372
tracked two-view displays, 631
tracking, 647
transfer function, 336
transfer hologram, 268
transflective displays, 430
transformation pipeline, 801
transformations, 801
transmission hologram, 212, 260
transparent circuits, 383
transparent driver circuits, 398
transparent electrodes, 355
transparent OLED, 452
transparent semiconductors, 355
transparent transistors, 355
trichromatic theory of color vision, 151
true anaglyphs, 600
true-color holograms, 269
tunneling, 70
TV displays, performance, 502
TV formats, 294
TV standards, 294
twisted nematic, 395
two-beam hologram, 261
two-sided workbenches, 613

UHP lamps, 33, 471
Ulbricht sphere, 41
ultra high performance lamps, 471
uncertainty principle, 62
uncertainty relation, 62
unified shaders, 807
Uniform Color Space, 159
unsharp mask display, 779

vacuum fluorescence, 453
vapor diffusion, 48
varifocal lens, 129
varifocal mirror, 119
varifocal mirror, w. NED, 730
vector displays, 286
vector laser scanners, 496
vergence, 170
vertex shader, 805

vertex shading, 824
video retargeting, 341
video see-through, 702, 776
video upsampling, 341
viewer orientation, stereoscopic displays, 583
viewer tracking, 647
viewing cone, 306, 308
viewing distance, stereoscopic displays, 584
viewing zones, 618
vignetting, 129
virtual devices, 689
virtual HOE, 241
virtual image, 113, 256
virtual objects, 689
virtual reality, 701
virtual retina display, 719
virtual retinal display, 717
visible light, 10
visual field, 170
visual flow eye tracker, 760
visual purple, 146
volume grating, 211
volume hologram, 211
volume holograms, 199, 262
volumetric displays, 632
volumetric emitter, 39, 306
VR, 701
VST-HMD, 776

walk-through, 609
wallpaper displays, 382
wave optics , 84
wave plate, 80
wavefront, 84
wavefunction, 55
wavelength multiplexing, 604
Weber-Fechner law, 147
wedge display, 488
white balance, 26
white point, 158
white-light reflection hologram, 264
wide color gamut displays, 312
Wien, 17
Wien's displacement law, 17
wobulation, 559

working $f$-number, 125

X-rays, 26

xenon arc lamps, 471

Young-Helmholtz three-component theory, 151

YUV-formats, 317

Zener diodes, 352

zero mode, 203, 256

zero order, 256

zone plate, 199, 665