

## SUBJECT INDEX\*

- 21 cm radio line, 216
- absorption, 3
  - free-free, 157
- active galactic nuclei, 333, 422
  - low luminosity, 345
  - precursors, 345
  - unified scheme, 345
- airglow, 257
  - time variability, 257
- A IV surveys, 456
- albedo, 199, 210, 239, 257, 485
  - for single scattering, 127
- Alfvén velocity, 414
- angular correlation function, 369
- anisotropies, 396, 400
  - dipole, 283, 295
  - quadrupole, 283
  - large-scale and small-scale, 400
- aperture synthesis, 283
- Apollo, 17, 227
- Apollo-Soyuz Test Project, 227
- asymmetry, 127, 199, 239
- atmospherically scattered light, 75
- atomic hydrogen, 157
- autocorrelation function, 408
- background, 307
  - 1400–1900 Å, 295
  - distance, 3
  - radiation, 21, 295, 420
  - starlight, 105
- balloon-borne telescopes, 35
- Balmer line emission, 107, 157
- baryon isocurvature model, 269, 295
- Be band, 241
- Berkeley bright patches, 227
- Berkeley-Nagoya balloon experiment, 469
- biasing, 295
- big bang, 3
  - hot, 469
  - model, 469
- BN-type objects, 113
- branching ratio, 387
- bright bulge, 35, 203, 205
- C+ emission from the galaxy, 149
- calibration, 118
  - absolute, 203
- CCD
  - camera, 283
  - imaging, 210
  - mosaic maps, 357
  - surveys, 245
- chromospherically, 107
- cirrus, 157, 235, 465
  - high latitude, 216, 235
  - infrared, 139
- cloud(s)
  - heating, 216
  - high velocity, 157
  - small optically thin, 241
- c-models, 269
- CO maps, 35
- coherence length, 295
- cold dark matter, biased, 269
- color excesses E(B-V) or E(U-B), 375
- color index B-V, 375
- color-magnitude relation, 269
- column density of the  $H^+$ , 157
- Comptonization, 317
- cooling flows, 283, 414
- coronal component, 157
- cosecant law, 257
- Cosmic Background Explorer, 149, 317, 381, 469
- cosmic background radiation, 283, 295, 400, 435
- cosmic microwave background, 392, 406
  - temperature, 390
- cosmic ray heating, 63
- cosmic rays, 157, 414
- cosmology, 369, 420
  - models, 257, 469
- count(s)
  - probability distribution, 408
  - faint galaxies, 365, 469
  - optical counts of galaxies, 469
  - sources, 469
- cryogenic telescope, 435
- Cygnus, 157
- dark
  - clouds, 199, 239
    - method, 257
    - prominent nearby, 205
  - count, 227
  - mass, 295

\*Page numbers in the index refer to the first page of the article that discusses the topic.

- matter, 283, 357
  - nebulae, 127
- decay photon spectrum, 387
- decaying particles, 387
- deceleration parameter, 269, 365
- density, 157
  - fluctuation, 418
  - baryonic matter, 345
  - baryonic parameters, 295, 345
  - local galaxy, 269
  - local low-density region, 241
  - profile, 239
  - structure, 239
- diffuse, 307
  - emission, 157
  - extreme-UV flux, 157
  - extragalactic background, 149
  - Galactic emission, 406, 459
  - intergalactic light, 357
  - interstellar medium, 157
  - ionized gas, 157
  - infrared radiation, 435
  - light in clusters of galaxies, 461
  - optical line emission, 157
  - radio emission, 406
  - scattered starlight, 257
  - ultraviolet background, 225, 227, 449
  - ultraviolet radiation at the galactic pole, 225
- diffuse Galactic light, 21, 127, 239, 257, 449
  - models, 127, 239
  - observations in the ultraviolet, 127
  - polarization, 75
- disk, 205
  - inner thin, 35
  - maximum radius, 121
  - outer, 35
  - thick, 85, 121
- discrete source contribution, 345
- distance determination, 199
- dust, 118, 225, 227, 237, 375, 402
  - albedo, 127
  - central dust lane, 205
  - clouds, 239
  - clouds, intergalactic, 245, 385
  - cosmic, 435
  - emission, 35
    - warm dust emission, 113
  - high latitude clouds, 357
  - interplanetary, 218
  - interstellar, 75, 139, 199, 210, 214, 225, 229, 396, 459
  - intergalactic, 245, 283
    - intragroup, 375
    - local interstellar, 203
    - mass, 239
    - scattering, 441
    - spectrum of high galactic latitude dust, 396
    - y galaxy, 283
- dynamics, 231
- Dynamics Explorer 1, 225
- early universe, 387, 398, 435
- electron
  - column density, 157
  - temperature, 15, 7
- element production, 295
- emission, 345
  - at north Galactic pole, 396
  - line emission, 157
    - from external galaxies, 149
  - line background, 157
  - measure, 157
  - nebulae, 459
  - optical line, 157
- energy density, 345
- epoch of last scattering, 295
- evolution of galaxies, 365
- evolution, radio, 469
- explosion picture, 295
- extinction, 35
  - coefficient, 367
  - mapping, 199, 239
- extragalactic, 229, 307
  - extragalactic background radiation, 21, 223, 225, 257, 269, 365, 400, 461, 469
    - from quasi-stellar objects, 269
  - extragalactic  $\gamma$ -ray background, 345
  - extragalactic X-ray background, 333, 345
- extreme ultraviolet, 157
  - background, 463
- Fabry-Perot observations, spectroscopy, 157
- Far Ultraviolet Imaging Spectrograph, 459
- far ultraviolet background, 157, 171, 441
- far-infrared, 149
- Fermi acceleration, second-order, 414
- filling fraction, 157
- fine-structure line emission, 149, 157
- flare, 107
- fluctuations, 283, 295, 357, 402, 416, 469
  - smoothness of the sky at 2.2  $\mu\text{m}$ , 317
- forbidden lines, 157
- forward-scattering, 127
- Galactic
  - arms, 123
  - component, 225

- corona, 441
- disk, 35
- dynamics, 35
- extinction, 367
- $H\alpha$  background, 157
- halo, 157, 371
- latitude dependence, 225
- models, 35
- radiation field, 157
- three-dimensional model, 35
- windows, 396
- galactic background, 139
  - infrared radiation, 113, 435
  - polarization, 75
- Galactic structure, 21, 35, 110, 121, 231, 233, 422, 435
  - Eridanus, 157, 235
  - Orion arm, 157
  - Orion-Eridanus shell, 157
  - Perseus spiral arm, 157
  - Sagittarius arm, 157
- galaxies, 245, 373
  - luminous infrared, 345
  - merged catalogue, 367
  - metacatalogue, 367
  - normal, 345
  - primeval, 245, 269, 317
  - strong radio, 345
  - very young, 257
  - young, 345, 269, 295
- galaxies, clusters of, 283, 333, 345, 377
  - Abell 2319, 406
  - Abell 2029, 357
  - Abell 426, 371
  - Virgo, 373, 379
- galaxies, individual
  - M31, 85, 118
  - NGC 13257, 377
  - NGC 4151, 345
  - NGC 5033, 85
  - NGC 891, 85
- galaxy
  - clustering inhomogeneities, 269
  - counts, 269, 295
  - distribution, 245
  - evolution, 245, 257
  - formation, 257, 420
  - frames of reference, 295
  - topology, 245
  - two-point spatial correlation function, 295
- gamma-ray background, 469
- gas
  - hot diffuse intergalactic, 345
  - hot intracluster, 345
  - ionized, 149, 157
  - ionized interstellar, 157
  - optically emitting, 157
  - temperature, 157
- gas-dust offsets, 235
- gas-to-dust ratios, 235
- GEISHA, 118
- geocoronal emission, 157
- geocoronal  $H\alpha$  and  $H\beta$ , 157
- global parameters, 35, 205
- globular clusters, 377
- gravitational lens, 245, 418
- great attractor, 295
- groups, 375
- Gum nebula, 157
- $H\alpha$ 
  - filaments, 235
  - line, 107
  - photography, 157
- $H_2$  fluorescence, 441
- $H\beta$  157
- HAC luminescence, 210
- halo, 315, 357
- hard X-ray
  - background, 469
  - spectra, 345
- HEAO-1 A4, 406
- heating, photoelectric, 63
- heavy element production, 295
- helios, 75, 105
- Herschel, William, 85
- high resolution, 205
- high spectral resolution, 157
- highly ionized species, 149
- H II regions, 149, 157
  - compact, 113
- Hopkins Ultraviolet Background Experiment, 441
- Hubble
  - constant, 85, 295
  - length, 295
  - type of the Galaxy, 85
- inflation, 295
- infrared, 123, 139, 157, 231, 269
  - background, 381, 387, 406, 429
  - cirrus, 139
  - emission, 157, 385
  - extragalactic background light, 317
  - point source sky, 110
  - radiation, 35
  - sky brightness, 295

- spectral line observations, 149
- telescope, 317, 435
- Infrared Astronomical Satellite (IRAS), 118, 218, 121, 123, 235, 465
  - 100  $\mu\text{m}$  cirrus, 210
  - Explanatory Supplement, 118
  - faint point sources, 373
  - flukes, 113
  - galaxy counts, 269
  - sky flux maps, 214
  - source counts, 110
- Infrared Space Observatory (ISO), 149, 429
- intergalactic light in clusters, 283
- intercluster medium, 414
- intergalactic gas, 257, 469
  - two-phase model, 345
  - reheating, 345
- intergalactic H I cloud, 157
- intergalactic ionized hydrogen, 257
- intergalactic medium, 424, 441
- interstellar, 237
  - CN, 392
  - extinction, 157
  - grains, 127
  - H<sub>2</sub> emission, 459
  - H I, 235
  - ionization, 157
  - matter, 139
    - interaction of the ISRF with, 63
    - physics, 435
    - polarization, 75
- interstellar medium
  - dust, 229
  - hot, 459
- interstellar radiation field, 485
  - in central region of the Galaxy, 63
  - in galactic disk, 63
  - in solar vicinity, 63
  - inside molecular clouds, 63
  - mean radiation intensity, 63
  - by dust, 63
  - by stars, 63
  - variation with galactocentric distance, 63
- inverse Compton, 283, 387
- ionization ratio, 157
- ionization source, 157
- ionization state, 157
- ionizing photon flux, 157
- infrared
  - filaments, 235
  - galaxies, 381
  - radiation, 118
  - starburst population, 269
  - telescope, 317, 435
- isotropy, 283, 333, 345
  - component, 225
- Johns Hopkins Applied Physics Laboratory, 441
- K-band polarization measurements, 35
- K-corrections, 269
- kinematics, 157
- Landolt, 357
- large-scale structure, 369, 416
- large-field technique, 127
- latitude dependence, 225
- light of night sky, 257, 461
- lines
  - C II, 435
  - O I, 435
- line of sight, 3
- line profile, 390
- local interstellar medium, 463
- luminescence, 233
- luminosity
  - density, 257
  - evolution, 269, 365
  - function, 107, 110, 269
    - 12  $\mu\text{m}$ , 121
- Lyman break, 245
- Lyman continuum photons, radiation, 157
- Lyman limit systems, 269
- magnetic field, 414
  - in clusters of galaxies, 406
  - primeval, 402
- main body, 205
- mapping of the galactic plane, 435
- mass
  - autocorrelation function, 295
  - large-scale fluctuations, 295
  - missing, 283
- mass-to-light ratio, 283, 357
- measurement, absolute, 149
- mergers, 269
- MgI doublet, 257
- MHD wave turbulence, 414
- microchannel plate detectors, 441
- microwave background, 333, 387, 398, 422, 469
- Milky Way, 85, 100, 118, 212
  - polarization, 75
- Mira variables, 118
- missions, future, 456
- molecular clouds, 465
- molecular hydrogen fluorescence, 441
- multivariate analysis, 214
- $\mu$ -models, 269

- Nagoya-Berkeley rocket experiment, 317  
 near-infrared, 35  
 near-infrared background radiation, 283, 435  
 near-infrared maps, 35  
 nebulae  
   Coalsack, 239  
   L134, 357, 257  
   L1642, 257  
 nebulae, reflection, 210, 459  
 nebular lines, 157  
 neutral hydrogen, 149, 157, 225  
 neutrinos, massive, 283, 387  
 night sky, 157  
 night sky level, 357  
 nonthermal motions, 157  
 nonthermal particles, 414  
 north ecliptic pole, 105  
 number evolution, 365  
 obscuration, 3  
 Olbers's paradox, 3, 257, 269  
 opaque filter, 463  
 optical, 269  
 optical background, 295, 469  
 optical brightness of the sky, 367  
 optical scattering, 210  
 Orbiting Astronomical Observatory 2, 127  
 OSO-5, 75  
 Owens Valley Radio Observatory, 295  
 particle accelerations, 414  
 particle background, 463  
 Petscheck reconnection, 414  
 phase function, 127, 199, 210  
 phase space, 283  
 photodissociation regions, 149  
 photoionization, 157  
 photoionization model, 469  
 photoionizing radiation, 469  
 photometric measurements, 157  
 photometric observations, 157  
 photon-counting image system, 449  
 Pioneer 10, 75, 85, 105, 127, 257  
 pixel distribution function, 357  
 plasma  
   high temperature, 241  
   hot intergalactic, 424  
 point spread function, 357  
 polarization, 333  
   atmospherically scattered light, 75  
   circular, 75  
   diffuse galactic light, 75  
   effects, 402  
   linear, 75  
   polycyclic aromatic hydrocarbons, 212  
   protogalaxies, 245  
   pulsar dispersion measures, 157  
   quadrupole moment, 295  
   quasars, 345  
     3C 273, 345  
     flat radio spectra, 345  
     luminosity, 418  
     radio-quiet, 345  
     steep radio spectra, 345  
   radiation field, 210  
     local, 157  
   radiative decay, 283  
   radio background emission, 469  
   radio free-free absorption, 157  
   red fluorescence, 485  
   reddening, 257  
   redshift asymmetry, 375  
   redshift distribution, 269, 375  
   redshift of galaxies, 245  
   relativistic beams, 345  
   relic, 295  
   ROSAT, 463, 465  
   Sachs-Wolfe effect, 295  
   Saltpeter initial mass function, 269  
   scalar velocity autocorrelation function, 295  
   scale height, 157  
   scale length, 85  
   scattering, 75, 225, 227, 229, 231  
     efficiency of interstellar dust grains, 379  
     properties, 127  
   Schechter luminosity function, 269  
   Science Applications Intl. Corp., 441  
   Seyfert 1 nuclei, 345  
   shock activity, 235  
   shocks, 157  
   S II, 157  
   Small Explorer program, 441  
   small-field technique, 127  
   soft X-ray, 157, 241  
   soft X-ray/XUV background, 463, 465  
   source, 123  
   source number-flux distribution, 408  
   Space Infrared Telescope Facility, 149  
   Space Shuttle, 227  
   Space Station, 441  
   Spacelab-2 Infrared Telescope, 35  
   Spartan payload, 459  
   spectra, 345  
     synthetic, 257  
   spectrophotometric evolution model, 365  
   spectroscopic observations, 157

- spectrum, 35, 333
  - of mass fluctuations, 295
  - of the extragalactic X- and  $\gamma$ -ray backgrounds, 345
- disks, spiral galaxy, 245
- star bursts, 412
- star counts, 103
  - automated, 199
- star count model, 121
- star formation, 235, 412
  - massive, 113
  - prominent regions, 205
- star masks, 257
- starlight, integrated, 21, 105, 257
  - brightness and colors, 103
- stars
  - active, 107
  - distribution of old, evolved stars, 35
  - dMe, 107
  - first generation, 283, 435
  - HD 21483, 392
  - hot, evolved, 157
  - K- and M-giant, 35
  - nearest, 3
  - O and B, 157
  - OH/IR, 118
  - population III, 469
  - red dwarfs, 107
  - red giants, 118
  - SN 1987A, 387
- stellar population, 35, 85
- stellar wind bubbles, 459
- structure (*see also* Galactic structure)
- structure, three-dimensional, 231
- structure, very broad, 233
- structures, very large-scale, 422
- submillimeter, 400
  - background, 295, 387
  - excess, 317, 381
- Submillimeter Wavelength Astronomical Satellite, 149
  - superbubble, 235
  - supernova remnants, 459
  - surface brightness, 85, 199, 205, 239
- distribution, 35, 203
- fluctuations, 345
- surface photometry, 100, 239
- TD-1 satellite, 127
- temperature, 157
  - and nonthermal motions, 157
- thermal bremsstrahlung, 424
- thermal emission, 231
- thermal radiation from dust, 295
- thermal reemission, 283
- thermal reradiation, 210
- Thomson scattering, 295
- tidal stripping, 357
- U-B, 375
- UBVRI photometry, 105
- ultraviolet, 229, 269, 307
- ultraviolet background, 223, 469
  - correlation with H I 21 cm radio intensity, 379
- ultraviolet extinction, 233
- ultraviolet Ceti, 107
- universe, expanding, 3
- universe, static, 3
- universe, steady-state, 3
- University of Wisconsin, 157
- U. S. Air Force Space Test Program, 459
- ultraviolet and X-radiation, 469
- UVX experiment, 227
- vacuum ultraviolet background radiation, 379
- velocity field, large-scale, 295
- velocity, peculiar, 295
- visible, 157, 365
- visible continuum, 157
- visible universe, 3
- Wide Field Camera, 463, 465
- winds, hot galactic, 345
- X-ray background, 333, 412, 416, 422, 469, 295
  - 345, 408, 424
  - and hot intergalactic medium, 345
  - residual, 345
- X-ray binaries, 412
  - massive, 345
- X-ray extragalactic background, 422
- X-ray shadowing, 465
- X-ray spectra, 345
- X-Ray Telescope (XRT), 465
- Zel'dovich spectrum  $P_{\kappa} \propto \kappa$ , 295
- zero-point field, 424
- zodiacal cloud, 231
- zodiacal emission, 118, 218
- zodiacal light, 75, 214, 257, 441
  - polarization, 75
- Zwicky magnitude, 367