

## Subject Index

- 1hT, 201
- adaptive systems, 205, 284–6
- AIAA, 186–7
- ALCOR, 70
- ALFA, 328
- ALMA, 40, 200–1, 243, 263, 343
- amateur astronomers, 136, 146, 357
- Arecibo, 200, 202, 215, 272–3, 293, 373–4
- artificial lighting, 50–1, 103–6
- artificial sky brightness, 95–102
- astronomical tourism, 42, 44–6
- astronomy,
- cultural importance, 39, 371–2
  - economic importance, 39, 41–2
  - value of, 24, 34–5, 353–4, 379–80
- atmospheric extinction, 98, 148–9, 156, 257
- atmospheric pollution, 117, 141, 149, 173–8
- atmospheric propagation, 96–7, 252
- atmospheric transmission, 260
- atmospheric transparency, 148–9, 156, 252
- ATN, 163–5
- ATNF, 286, 390, 394
- AUASS, 172
- AURA, 39–48
- automatic telescope, see robotic telescope
- aviation, 173–8
- BAO, 307–10, 311, 315
- blanking, see time sharing
- bolometer, 242, 251–2
- bridges, 166–9
- BRM, 307, 310
- BSS, 232, 242
- CCD, 161, 164–5, 188–91
- CCIR, 25, 210–3
- CEN, 61
- CEPT, 266
- Chelmos, 160–2
- CIE, 12, 26, 29, 36, 51–3, 60–8, 69–76, 77–80, 117–8, 123
- cloud cover, 103, 160–1, 171, 175–6, 350
- cloud profiling radar, 250–1
- COBE, 326–7, 373
- collision avoidance radar, 249
- commons, 370–1
- CONAMA, 44
- CONICYT, 45
- contrails, 173–8
- coordination zone, 243, 249, 253, 265
- COPUOS, see UN-COPUOS
- CORF, 27, 212, 267
- correlation, 286, 336
- COSPAR, 14, 16–7, 28, 184, 185, 210, 225, 395
- CRAF, 27, 212, 215, 262, 264–9, 295–6
- CrAO, 153–4
- CTIO, 39–48, 172
- Dark Night, 131–2
- Dark Sky Preserve, 357, 388
- developing nations, 170–2, 270
- DLOR, 52–9, 387
- DLR, 175
- DMSP, 42, 92–3, 95–102, 103–6, 107–10, 134, 363–8
- DRAO, 281–2, 336
- EAAE, 146
- EC, 266
- Education, 17, 115, 135, 146, 165, 343–52, 353–8, 359–62, 363–8, 377–84, 387–8, 391–2
- EESS, 212, 250–1, 255–63
- EISCAT, 267
- energy waste, 36, 42, 87–94, 107–10, 126–9, 145, 363–8
- environmental impact, 10–22, 29–30, 207, 370–1

- environmental impact statement, 16, 217–8  
 ERC, 266  
 ERO, 266  
 ESA, 182, 191, 263  
 ESF, 264–9, 295  
 ESO, 146, 172, 177, 343, 350–1  
 ETSI, 266  
 EVN, 264
- FAAQ, 135  
 FAST, 272–8, 310  
 FCC, 238–9, 249  
 FFT, 281, 301, 318  
 filtering, 157, 205, 213, 216, 251, 253, 279  
 FIRST, 263  
 floodlights, 50, 65, 79–80, 166–7  
 FLWO, 122–5  
 FORTE satellite, i  
 frequency protection, 310, see also CORF, CRAF, ITU, IUCAF  
 frequency sharing, 230–3, 240, 253, 255–63, 265, 332, 340  
 FSS, 231–2, 241–2
- GBT, 200–2, 281  
 GEO, see GSO  
 geographical sharing, 253, 331  
 geophysics, 28  
 GLONASS, 10, 13–4, 213–4, 217, 220, 233, 240, 268  
 GMRT, 13, 200–1  
 GMS, 213  
 GMSK, 270  
 GNAT, 164, 170  
 GPS, 217, 233, 289, 309, 319–23, 372  
 GSM (grating scale monitor), 171  
 GSO, 182–4, 185, 239–40, 260–1
- HALCA, 335–40, see also VSOP  
 HAPS, 191–2, 231, 249–50  
 HCA, 321–3  
 HF, 238  
 Hokule'a, 43  
 HPS (high-pressure sodium) lamps, 7–8, 55–9, 83–6, 134, 166, 168  
 HSOS, 138–41  
 hydrogen line, 210, 214, 222  
 hydroxyl, see OH
- IAA, 181, 184, 186  
 IADC, 184, 186  
 IAF, 185, 395  
 IAU, 3–5, 7–9, 10–22, 24–9, 117, 170, 173, 212–3, 225, 344, 387–8, 389–90, 397–8  
 Commission 9, 165  
 Commission 40, 26, 212–3, 390, 395  
 Commission 46, 353  
 Commission 50, 11–15, 26, 117, 358, 387–8, 395  
 ICAO, 173  
 ICSU, 14, 28, 210, 216  
 IDA, 33–8, 44, 88, 123, 136, 344, 358, 362  
 IDMP, 64  
 IEC, 60, 66  
 IF, 303, 315–7  
 ILE, 72  
 image processing, 288–91  
 INMARSAT, 214–5, 268, 338–9  
 interference, see radio frequency interference (RFI)  
 internet, 66, 123, 135, 137, 146, 164–5, 267, 296, 351–2, 359, 364, 383–4, 390, 392  
 IRA, 153, 157  
 IRAM, 246  
 Iridium satellites, 10, 204, 215, 240, 268, 310, 382  
 IRQZ, 271, 371  
 ISO, 60, 66, 118, 130  
 ITU, 12, 20, 26, 203, 206, 209–19, 220–8, 229, 239, 249–53, 261–2, 266–9, 292, 321, 330–3, 399–400  
 ITU-R, 210, 221, 231, 233  
 Handbook on Radio Astronomy, 224–5, 251, 292, 332, 390  
 Recommendations on Radio Astronomy, 222–4, 242–3, 251, 281–2, 337  
 Working Party 7D, 222, 390  
 Radio Regulations, 209–19, 220–8, 325, 393–5  
 IUCAF, 11, 27, 210–6, 223, 225, 254, 344  
 IUGG, 28

- JAC, 254  
jet contrails, 173–8  
JIVE, 264  
Jodrell Bank, 200, 214, 220, 264–5  
KARST, 273, 278  
KPNO, 121–5  
Lagrangian points, 207, 227, 326–30, 333  
lamps, see floodlights, HPS, LPS, luminaires, MH  
laser communications, 190–1  
LDEF, 182  
LED, 64, 67, 74  
LEO, 182–4, 212, 215, 293  
light curve, 193–5  
light nuisance, 88  
light pollution, 7–9, 10–22, 33–8, 49–59, 64–5, 347–9, 387–8, 395  
American Southwest, 103–6  
Belgium, 87–94  
bridges, 166–9  
Cairo, 107–10  
Chile, 39–48  
cultural aspects, 43  
education, 348–9, 353–8, 359–62, 363–8  
Europe, 95–102  
Germany, 142–6  
Greek Programme, 359–62  
impact on ATN, 163–5  
Indonesia, 147–50  
Italy, 111–6, 126–9  
Japan, 117–9  
Japanese Government Guideline, 117–9  
Netherlands, 130–3  
Quebec, 134–7  
Turkey, 151–2  
Ukraine, 154–6  
vs. radio pollution, 377–8  
light trespass, 35, 65  
lighting ordinances, 37, 43–4, 82–3, 103–6, 111–6, 117–9, 120–5  
LO, 281, 309  
LOFAR, 200–1  
LPS (low-pressure sodium) lamps, 7–8, 37, 44–6, 71–2, 81–6, 123  
LSB, 274  
luminaires, 49–59, 78–9, 126–9, 144  
MAO, 153–4  
MASTER, 263  
media, 343–52, 357, 391  
Mega Science Projects, 201  
meteorology, 28, 255–63  
MH (metal halide) lamps, 83–6  
microwave background, 327–8, 372–3  
microwave radiometry, 255–63  
millimetre-wave astronomy, 242–3, 245–54, 329, 374–6, 393–4  
MLS (microwave landing system), 217  
MLS (microwave limb sounder), 262  
MMDS, 313  
molecular spectra, 211–2, 242, 246–8, 374–6  
Moore’s Law, 199  
MSRT, 288–91, 308  
MSS, 212, 231, 242  
NASA, 163–4, 182, 193, 262, 328  
NATO, 268  
Needles Project, 216, see also Project West Ford  
NFRA, 205, 265, 283  
NGDC, 96, 364  
NGSO, 239–40  
NOA, 160–2  
NOAA, 96, 160, 175–6  
NOAO, 48  
Norma Luminica, 43–4, 395  
NRAO, 205, 207, 215, 246, 280, 382, 392  
NRO, 246  
NSA, 293–4  
NSB (night sky brightness), 155, see also sky glow  
observing conditions, 176–8  
obtrusive light, 35, 51, 65, 77–80  
OCS, 165  
ODIN, 263, 329  
OECD, 271  
    Global Science Forum Task Force on Radio Astronomy, 207, 395, 399–400  
OH 1612-MHz line, 14, 25, 204, 213–4, 382  
OLC (outdoor lighting code), 121–4, see also lighting ordinances

OLS, 92, 95–6, 98  
 optical observatories, 122, 153–4  
 outdoor lighting, 34, 77–80, 120–5,  
 166–9

Parkes radio telescope, 200, 202  
 passive services, 229–35, 255–63  
 passive spectrum, 218  
 PEDAS, 28  
 photographic survey, 131, 189–90  
 photometer, 193–4  
 planetarium, 135, 146, 357  
 PMO, 307–10  
 PMT, 96, 98  
 political action, 136  
 Project West Ford, 25–6, see also  
 Needles Project  
 pulsars, 373–4  
 PVS, 43

radio astronomy, 199–208, 377–84  
 continuum bands, 214, 239, 248,  
 258  
 cultural value, 369–76, 379–80  
 facilities, 154, 157, 201, 264–5,  
 297–8, 308, 311–2  
 funding, 207  
 sensitivity, 199–200, 248, 251,  
 270, 281, 337  
 radio frequency interference (RFI),  
 199–208, 279–287, 330–3,  
 335–40, 347–9  
 cancellation, 205, 284–6  
 characterization, 282, 301–6,  
 337–8  
 China, 288–91, 307–10, 311–4  
 databases, 295–6, 390  
 education, 377–84, 391–2  
 excision, 204–5, 283–7  
 Hungary, 319–23  
 in space, 330–3, 335–40  
 measurement, 272–8, 297–300,  
 301–6, 311–4, 315–8, 319–23,  
 335–40  
 mitigation, 203–6, 279–87, 288–  
 91, 317–8, 389–90  
 monitoring, 157–8, 292–6, 301–  
 6  
 polarization, 286–7, 313–4  
 rejection, 202, 288–91

space-borne, 203–4, 310, see also  
 GLONASS, Iridium, TEX  
 terrestrial sources, i, 203, 236,  
 308–9, 319–23  
 vs. light pollution, 377–8  
 radio-quiet zone, 20, 204, 218, 222,  
 271, 278, 280–1, 310, 371, 400  
 Radio Regulations, see ITU  
 RCT, 163  
 Recommendation 66, 215–6, 233–4  
 road lighting, 49–59, 64–5, 71–4,  
 85–6, 88–91, 113–5, 126–7,  
 143–5  
 alternatives to, 73–4  
 robotic telescope networks, 163–5,  
 170–1  
 SAIt, 112–4  
 satellites, i, 193–5, 236–44, 394, see  
 also BSS, EESS, FSS, MSS  
 broadcasting, 214, 216, 310  
 downlinks, 240–2  
 meteorological, 213  
 tracking, 293  
 trails, 189–91  
 SAW filter, 288–91  
 scattering, 95–8  
 science policy, 207–8, 377–84  
 scientific literacy, 381  
 SCOPE, 28  
 seeing, 140, 156, 160–2, 174  
 SERNATUR, 42  
 SEST, 246  
 SETI, 225, 330, 349  
 SHAO, 307–10  
 shielded zone of Moon, 211–2, 330  
 sidelobe levels, 252  
 signal processing, 202–6, 217, 279–  
 87, 288–91, 301–6, 317–8  
 SIS junction, 248, 251, 333  
 site protection, 135–6, 147–50, 152,  
 159, 170–2, 176–7  
 site selection, 160–2, 171  
 site survey, 272–8, 282  
 site testing, 160–2  
 SKA, 199–201, 272, 278, 282  
 sky brightness, 40–1, 47, 82, 117,  
 120–5, 149  
 sky glow, 36, 49–59, 69–72, 108,  
 130–3  
 SOAR, 45

- SOC, xvii  
SOFIA, 263  
solar observation, 138–41  
solar radio astronomy, 236, 311–4,  
    315–8  
solar reflectors, 190–1  
SOPRANO, 263  
space advertising, 15–6, 395  
“Space Billboard”, 15  
space debris, 19–20, 181–4, 185–7,  
    188–92, 193–5, 349–50  
space hazards, 181–4, 190–1, 395  
space law, 17  
space radio astronomy, 324–34  
space-VLBI, 326–7, 332, 335–40  
spatial nulling, 205, 284–6  
spectrometer, 281, 301–6, 311–2,  
    315–8  
spectrum management, 203–4, 238,  
    280–1  
spectrum pricing, 206, 219  
spread spectrum modulation, 217,  
    301–6, see also GMSK  
SSB, 274  
“Star of Tolerance”, 15, 29, 190  
stray light, 139  
street lighting, see road lighting  
submillimetre-wave astronomy, 245–  
    54, 263, 329  
SVLBI, 325–7, 332, 335–40  
  
TCS, 165  
telecommunications, 205–6, 236–44,  
    321–3  
TEX satellite, 267  
time sharing, 251, 253, 283–4  
tourism, 42, 151–2  
TÜBITAK, 151  
  
UAO, 307–10  
ULOR, 52–9, 71, 387  
UN, 3, 29, 185–7  
    COPUOS, 3, 9, 14–6, 184, 185–  
        7, 344, 395  
    Scientific and Technical Sub-  
        committee (S&T), 16, 18, 29,  
        184, 395  
    Office for Outer Space Affairs  
        (OOSA), 3–6, 16–7, 172  
    Space Treaty, 8  
UNESCO, 14–15, 28–9, 218, 361  
  
UNISPACE III, 3–6, 16–20, 184,  
    186–7, 228, 397–8  
unwanted emissions, 19–20, 212,  
    215–6, 229–35, 240–1, 249,  
    394  
URSI, 14, 210, 217, 225  
USB, 274  
UWLR, 52–9, 78  
  
VHF, 238  
Vienna Declaration, 18–20  
VLA, 200–1, 380–2  
VLBI, 157, 199, 225, 264–5, 297–8,  
    309, 335–40  
VLT, 40, 177  
VMM, 87  
VSOP, 326, 332, 340, see also  
    HALCA  
VST, 40  
  
WARC, 209, 229  
    WARC-1959, 210  
    WARC-1963, 210  
    WARC-1971, 211  
    WARC-1979, 211–2, 215,  
        229–30  
    WARC-1992, 212, 233  
weather, 138–41, 160–2  
WEBT, 164  
WMO, 28, 64  
World Heritage Sites, 14–6, 218  
world wide web, see internet  
WRC, 209, 221, 229  
    WRC-1997, 212, 230, 234, 250  
    WRC-2000, 212, 226–7, 229–35,  
        241–4, 393–5  
  
YAO, 307–10  
  
Znamya, 15, 190–1  
zoning, 53, 70–1, 114–5