

List of Participants

Name	Address
Arp Halton	Max-Planck-Institut für Astrophysik Karl-Schwarzschild-Straße D85748 Garching Germany arp@mpa-garching.mpg.de
Axon David J.	Space Telescope Science Institute 3700 San Martin Drive Baltimore, MD 21218 USA axon@stsci.edu
Bicknell Geoffrey V.	Mt. Stromlo & Siding Spring Observatories ANU / Private Bag Weston Creek, A.C.T. 2611 Australia gvb@maths.anu.edu.au
Binggeli Bruno	Astronomisches Institut Universität Basel Venusstraße 7 CH-4102 Binningen Switzerland binggeli@astro.unibas.ch
Binney James	Department of Physics Keble Rd. Oxford, OX1 3RH United Kingdom j.binney1@physics.oxford.ac.uk
Biretta John	Space Telescope Science Institute 3700 San Martin Drive Baltimore, MD 21218 USA biretta@stsci.edu
Blandford Roger	California Institute of Technology 130-33 Pasadena, CA 91125 USA rdb@tapir.caltech.edu
Böhringer Hans	Max-Planck-Institut für extraterrestrische Physik Giessenbachstrasse -85748 Garching Germany hxb@mpe-garching.mpg.de

Name		Address
Camenzind Max		Landessternwarte Königstuhl D69117 Heidelberg Germany M.Camenzind@lsw.uni-heidelberg.de
Cramphorn Conrad		Max-Planck-Institut für Astrophysik Karl-Schwarzschild-Straße D85748 Garching Germany conrad@mpa-garching.mpg.de
Crane	Phil	European Southern Observatory Karl-Schwarzschild-Straße D85748 Garching Germany PCrane@eso.org
Dehnen	Walter	Theoretical Physics 1 Keble Road Oxford, OX1 3NP United Kingdom w.dehnen@physics.ox.ac.uk
Dopita	Michael	Mt. Stromlo & Siding Spring Observatories Private Bag Weston A.C.T. 2611 Australia michael.dopita@anu.edu.au
Eilek	Jean	New Mexico Institute for Mining and Technol- ogy Socorro, NM 87801 USA jeilek@nrao.edu
Ford	Holland	Space Telescope Science Institute 3700 San Martin Drive Baltimore, MD 21218 USA ford@stsci.edu
Hardee	Philip E.	University of Alabama Department of Physics & Astronomy Tuscaloosa, AL 35487 USA hardee@venus.astr.ua.edu
Harris	Daniel	Center for Astrophysics 60 Garden Street Cambridge, MA 02138 USA harris@cfa.harvard.edu
Heinz	Sebastian	University of Colorado JILA BOX 440 Boulder, CO 80309-0440 USA heinzs@bogart.colorado.edu

Name		Address
Klein	Uli	Radioastronomisches Institut der Universität Auf dem Hügel 71 D53121 Bonn Germany uklein@astro.uni-bonn.de
Laing	Robert	Royal Greenwich Observatory Madingley Road Cambridge CB3 0EZ U.K. rl@ast.cam.ac.uk
Macchetto	Duccio	Space Telescope Science Institute 3700 San Martin Drive Baltimore, MD 21218 USA macchetto@stsci.edu
Massaglia	Silvano	Osservatorio Astronomico di Torino Strada Osservatorio 20 I-10025 Pino Torinese Italy massaglia@ph.unito.it
Matsumoto	Hironori	Cosmic Ray Group Dept. of Physics Kyoto Kitashirakawa-Oiwake-Cho Sakyo-ku Kyoto 606-01 Japan matumoto@cr.scphys.kyoto-u.ac.jp
Meisenheimer	Klaus	Max-Planck-Institut für Astronomie Königstuhl 17 D69117 Heidelberg Germany meise@mpia-hd.mpg.de
Neilsen	Eric	Johns Hopkins University Department of Physics & Astronomy Baltimore, MD USA neilsen@pha.jhu.edu
Norman	Michael	Max-Planck-Institut für Astrophysik Karl-Schwarzschildstraße D85740 Garching Germany norman@ncsa.uiuc.edu
Owen	Frazer	National Radio Astronomy Observatory P.O. Box 0 Socorro, NM 87801 USA fowen@nrao.edu
Reynolds	Chris	JILA University of Colorado Campus Box 440 Boulder, CO 80309-0440 USA chris@rocinante.colorado.edu

Name	Address
Röser	Hermann-Josef Max-Planck-Institut für Astronomie Königstuhl 17 D69117 Heidelberg Germany roeser@mpia-hd.mpg.de
Rottmann Helge	Max-Planck-Institut für Radioastronomie Auf dem Hügel 69 D53121 Bonn Germany rottmann@astro.uni-bonn.de
Scheuer Peter	Mullard Radio Astronomy Observatory Cavendish Laboratory Madingley Road Cambridge CB3 0HE United Kingdom pags@mrao.cam.ac.uk
Sparks	William Space Telescope Science Institute 3700 San Martin Drive Baltimore, MD 21218 USA sparks@stsci.edu
Tsvetanov Zlatan	Johns Hopkins University Department of Physics & Astronomy Baltimore, MD 21218 USA zlatan@pha.jhu.edu

Subject Index

- 0828+32, 59
- 3C 219, 63
- 3C 264, 287
- 3C 465, 59

- abundance, 93
 - Fe, 93
 - O, 93
 - S, 93
 - Si, 93
- acceleration
 - diffusive shock -, 191
 - of particles, 251
- accretion rate, 314
- adiabatic compression, 230
- adiabatic processes, 251
- advection dominated accretion flows,
122
 - ADAF, 314
- AGN
 - fueling of, 143
 - kinetic luminosity, 313
- ASCA, 93
- astrology, 9
- AXAF, 323

- Balbus-Hawley instability, 316
- black hole, 26, 34, 120
 - binary, 36
 - formation, 36
 - interaction with host, 38
 - interaction with stars, 36
 - light cylinder, 266
 - magnetosphere, 263
 - mass limit, 38
 - radius of influence, 254
 - rotation, 265
 - rotational energy, 258
 - spin axis, 26
 - supermassive
 - in M 87, 291
 - rotation curve in M 87, 295, 297
- Bondi accretion, 314

- cD galaxy, 26
- CDM, 107
- Centaurus A, 45, 159
- CfA redshift survey, 15
- CHDM, 108
- clusters
 - cooling flows, 107
 - core, 111
 - halo, 108
 - mergers, 107
 - simulations, 107
 - radio halos, 107
 - substructure, 106
- COBE, 108
- Compton heating, 121
- conductive evaporation, 118
- cool filaments, 119
- cooling catastrophe, 120
- cooling flow, 74, 116, 143
- CSS sources, 56
- Curtis, Heber D., 1
- cutoff frequency, 192, 196
- Cygnus A, 189

- dark halo, 32
- dark matter, 107
- density cusp, 34
 - formation, 36
- depolarization, 56, 138
- depth

- of Virgo cluster, 18
- disk
 - accretion, 256
 - advection dominated, 259
 - density distribution, 255
 - magnetic fields, 260
 - mechanical equilibrium, 255
 - radius, 255
- distance, 52
 - of M 87, 18
 - of Virgo cluster, 17
- distance estimates
 - $D_n - \sigma$, 18
 - globular clusters, 18
 - novae, 18
 - planetary nebulae, 18
 - surface brightness fluctuations, 18
- dynamics
 - stellar, 34
- EINSTEIN HRI, 204
- Einstein Observatory, 100, 319, 321
- ejection
 - of galaxies, 43
- electron distribution
 - maximum energy, 193
 - powerlaw, 193
- elliptical, 252
 - angular momentum, 254
- emission
 - inverse Compton, 322
 - synchrotron, 322
 - thermal bremsstrahlung, 322
- emission filaments, 142
 - gas in elliptical galaxies, 143
 - M 87, 148
 - HST observations, 152
 - ionization, 155
 - kinematics, 154
 - origin, 155
 - velocity field, 150
 - stellar mass loss, 143
 - theory, 146
- emission lines
 - excitation, 243
- emissivity, 230, 231
- environment
 - of Virgo cluster, 18
- Fanaroff-Riley classes, 77, 159
- Faraday rotation, 74, 131, 136
- finger of God, 19
- FR-I/FR-II dichotomy, 317
- FR I sources, 56
- FR II sources, 56
- FRW universe, 107
- galaxies
 - formation, 31, 106
 - large scale structure, 106
 - X-ray clusters, 106
- globular clusters, 32, 53
 - colors, 53
 - kinematics, 32
 - luminosity function, 51
- H α filaments, 74, 117, 125, 133
- heating, 76
- hierarchical models, 106
- hot spots, 190
- ICM, 103, 106
 - bulk motions, 107
 - turbulence, 106
- infall
 - of cluster galaxies, 17
- inflation, 106
- inner lobes, 74, 130
 - bubble model, 242
 - dynamics, 242
 - optical emission, 200
 - patch θ
 - NIR emission, 201
 - radio-optical spectrum, 201
 - patch θ , 200
 - radio-optical spectrum, 200
- instabilities, 134
- intermittent activity, 56
- intracluster gas, 93
- intracluster medium, 23
- ISM
 - interaction with ICM, 103
 - pressure, 229, 232
 - rotation of, 126
- Jean's equation, 110
- jet
 - alignment, 24

- energy flux, 240
- formation, 121
- heating by, 121
- highly collimated, 202
- injection conditions, 267
- instabilities, 251
- Lorentz factor, 226
- luminosity, 121, 265
- magnetisation, 267
- model, 236
- non-relativistic, 232
- opening angle, 211
- optical spectral index, 195
- orientation, 24, 229–232
- orientation angle, 226
- polarization, 217
- proper motions, 223
- relativistic, 230, 233
- spectrum, 217
- superluminal motion, 223
- jet spectrum
 - powerlaw index α_{PL} , 195

Kelvin-Helmholtz instability, 237, 251

kinematics

- of Virgo cluster, 13, 23
- stellar, 34

knot

- velocity, 231

Laing-Garrington effect, 56

large-scale structure, 56

local supercluster, 17

Lorentz factor, 229–232

luminosity

- Poynting flux, 264

M 100, 13, 17

M 49, 13, 43, 95

- subclump, 13, 17, 19

M 60, 13

M 84, 11

M 86, 11, 23

- subclump, 11, 17, 19, 22

M 87

- accreting flow, 3
- black hole mass, 281
- companions of, 21
- cooling flow, 3

- counter jet, 6
- dark central cluster, 283
- distance of, 18, 159
- energy requirements, 1
- environment of, 11, 21
- Fanaroff-Riley class, 159
- luminosity, 2
- mass of, 32
- mass profile, 19
- mass-to-light ratio, 281
- neighbourhood of, 21
- nuclear disk
 - classification, 279
 - dusty (D-type), 279
 - filaments, 281
 - ionized (I-type), 279
 - kinematics, 281, 284
 - morphology, 280, 304
 - non-Keplerian motions, 284
 - outflow, 281
- optical identification, 1
- orientation, 13
- position, 11
- radial velocity, 15
- radio tails, 115
- satellites of, 21
- subclump, 11, 17, 19, 22
- X-ray halo, 19
- X-ray map, 100
- M 87 jet, 271
 - brightness distribution, 198
 - changes in inner jet, 171
 - collimation, 4
 - counter jet, 177
 - cutoff frequency, 192, 195
 - dark lane, 176
 - discovery of, 1
 - disruption, 80
 - electron distribution
 - slope, 195
 - filaments, 191
 - flux variations, 165
 - high frequency observations, 188
 - hydrodynamics, 271
 - instabilities, 271
 - motions, 271
 - structures, 271
 - inclination, 5

- inner jet, 168
- kinematics, 163
- magnetic field
 - variations, 199
- magnetic field structure, 169
- morphology, 192
- multi-epoch observations, 192
- nature of X-ray emission, 205
- near-infrared photometry, 191
- optical knot HST-1, 203
- optical observations, 190
- optical spectral index, 192, 194
- orientation of, 13, 24
- outer jet, 177
- overall spectrum, 192, 193
- parsec-scale, 161
- particle energy distribution, 199
- polarization, 192
- power, 3
- proper motion, 192
- radio observations, 159
- spectrum, 188
 - powerlaw index α_{PL} , 195
- superluminal motion, 4, 171
- surface brightness, 199
- synchrotron radiation, 190
- variability, 207
- VLBI, 4
- VLBI maps, 192
- X-ray emission, 204
- X-ray emission as synchrotron radiation, 206
- X-ray flux, 192, 206
- M 87/M 86
 - subclump interaction, 17, 22
- magnetic field
 - minimum energy, 197
- magnetic field, 56, 74, 79, 134, 138, 251
 - dynamo, 139
 - equipartition, 196, 229-231, 233
 - minimum energy, 196
 - models, 138
 - orientation, 230
 - strength, 229, 230, 232, 233
 - within jet, 217
- magnetic field lines, 118
- magnetic field strength, 322
- mass drop-out, 117, 124
- maximum energy, 196
- merging
 - of subclusters, 17, 22
- Messier objects, 10
- morphology-cosmology connection, 107
- morphology-density relation, 13
- multiple activity, 68
- NGC 1265, 59
- NGC 326, 59, 60
- NGC 4105, 147
- NGC 4261
 - black hole mass, 279
 - mass-to-light ratio, 279
- NGC 4476, 52
- NGC 4478, 52
- NGC 4486B, 52
- NGC 4696, 144, 145
- NGC 5128, 159
- NGC 6251
 - black hole mass, 280
 - mass-to-light ratio, 280
- nuclear activity, 93, 120
 - heating by, 123
- nuclear disks
 - classification, 287
- orientation
 - of M 87, 27
- outer radio halo
 - age, 80
 - energy sources, 81
 - mixing, 79
- particle acceleration, 190, 229, 230, 232
 - adiabatic, 229, 230
 - Fermi, 230
 - in situ, 191
 - sites of, 202
- particle aging, 56, 69
- particle distribution, 251
- PG 1211+143, 45
- polarization, 68, 190
 - linear, 56
- power-law index α_{PL} , 196
- precession, 56, 68
- pressure, 56, 133, 232
 - cocoon, 232
 - equipartition, 232

- ISM, 232
- radio halo, 56, 66, 72
- radio jets, 189
- radio lobes, 27, 56
- radio luminosity, 56
- radio sources
 - asymmetries, 56
- ram pressure stripping, 23
- Rankine-Hugoniot conditions, 239
- relativistic jets, 271
 - hydrodynamics, 271
 - instabilities, 271
 - motions, 271
 - structures, 271
- ROSAT, 19, 100
 - HRI, 319
- ROSAT HRI, 204
- rotation measure, 56, 136
- rotation velocity, 32

- SBF, 50
- shock waves, 111
- shocks, 74, 103, 126, 251
 - acceleration in, 322
 - bow, 103
 - dynamics, 239
 - oblique, 230
 - orientation, 236
 - production by Kelvin-Helmholtz instability, 237
 - proper motion, 236
 - relativistic effects on appearance, 236
- simulations
 - hydrodynamic, 191
- simulations, hydrodynamic, 106
- spectral index, 56, 66
- spectrum
 - break, 231
 - cutoff, 229-231
 - nuclear, 300, 306, 308
 - absorption lines, 308
 - continuum, 308
 - emission lines, 309
- star formation, 119
- subcluster merging, 17, 22
- subclustering, 11
- supernovae, 120
- surface brightness fluctuations, 50

- synchrotron emission, 56, 229, 251
 - break frequency, 67
 - loss-time, 190
 - luminosity, 122
 - particle lifetimes, 134
 - power-law, 229, 231
 - spectral index, 229
- synchrotron lifetime, 207

- tailed sources, 56
- thermal conductivity, 118
- thermal plasma
 - components, 93
- thermal stability, 117
- transonic flow, 74
- turbulence, 74, 80, 106, 134, 139
 - decay rates, 113
 - dissipation, 140
- two-temperature plasma, 316

- unified models, 226

- variability
 - nuclear, 300, 306, 311
- velocity dispersion, 32, 109
- Virgo, 9
 - history, 9
- Virgo cluster
 - depth of, 18
 - distance of, 17
 - environment of, 18
 - kinematics, 13, 23
 - Las Campanas survey, 11
 - map, 12
 - radial velocities, 15
 - structure, 11, 43
 - subclumps, 11
 - velocity distribution, 16
 - X-ray image, 20
- Virgo A, 130
- virial radius, 108
- virial temperature, 108
- virial velocity, 108
- vorticity, generation, 111

- WAT radio sources, 107
- winds, 314

- X-ray clusters, 106

- X-ray emission, 83
 - AGN, 97
 - cooling flow, 85
 - interaction ICM / radio lobes, 87
 - mass determination, 84
 - X-ray halo, 84
- X-ray excess, 79
- X-ray observations, 314
- X-ray structure
 - of Virgo cluster, 19, 23
- X-rays, 56, 74
 - absorption, 105
 - cooling flow, 116
 - correlations to radio, 126
 - emission lines, 94
 - broad iron lines, 316
 - hardness ratio, 102
 - knot A, 319
 - merger, 104
 - monitoring, 319
 - nucleus, 319
 - shock front, 100
 - spur, 100-102, 104
 - variability, 319, 321, 323
- X-shaped sources, 56