Curriculum Vitae

Houjun Mo

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1. CURRICULUM VITAE

1.1. Education:

9/1979-7/1983	BS (7/83; Phys.)	Dept. of Phys., Anhui Univ.
9/1983-4/1987	MS (1/86; Astrophys.)	Univ. of Sci. & Tech. of China
5/1987-6/1991	PhD (6/91; Astrophys.)	Munich University

1.2. Professional Employment:

1991 - 1994	Postdoctoral fellow	Institute of Astronomy, Cambridge
1994 - 1995	Postdoctoral member	Institute of Advanced Study, Princeton
1995 - 1998	Tenure-track position:	Max-Planck-Institut für Astrophysik
1999 - 2003	Tenured scientific staff	Max-Planck-Institut für Astrophysik
2003 - 2008	Associate professor	Astronomy, UMass
2008 -	Full professor	Astronomy, UMass

1.3. HONORS

Master Chair Professor, Univ. of Sci. & Tech of China
Honorary Professor, Shanghai Observatory
Key-Projects Advisor, Chinese Academy of Sciences
Outstanding Overseas Young Scientist, Chinese Academy of Sciences
Visiting Professor, Padova University, 2000
PhD thesis with the highest honor (Summa Cum Laude)

2. TEACHING AND SUPERVISION

2.1. Courses taught

1. Astro 100, Exploring the Universe
2. Astro 330H, Cosmology and Galaxies
3. Astro 452H, Astrophysics II: Galaxies
4. Astro 791, Astronimical literature
5. Astro 850, Galaxy formation and evolution
6. Perturbation theory and non-linear evolution of the cosmic density field

2.2. Lectures given at off-campus schools

1. Galaxy Formation, 2010, Trieste Summer School on Cosmology, Trieste, Italy (200 students, 6 hours)
2. Dark matter halos, 2009, Summer School, Santa Fe
3. Structure formation in the universe, 2007, Summer School, Taipei (50 students, 10 hours)
4. Structure formation in the universe, 2002, Dresden Univ. (40 students, 15 hours)
5. Galaxy formation and evolution, 2002, Beijing Univ. (50 students, 30 hours)
6. Cosmology, large-scale structure of the universe and galaxy formation, 2000, Shanghai Observatory (50 students, 50 hours)
7. Structure formation in the universe, 1999, Padova Univ. (20 students, 10 hours)

2.3. Students supervised

1. Zhankui Lu: RA, second year project, UMass
2. Wentao Luo: exchange PhD student from Shanghai Astronomical Observatory
3. BoMee Lee: RA, second year project, UMass

4. Sirinrat Sithajan: second-year project

5. Ran Li: exchange PhD student from Peking University.

6. Yu Lu: RA, UMass

7. Yun Li: RA, UMass

8. Yicheng Guo: second year project.

9. Shiyin Shen: former graduate student; PhD thesis: The structural properties of galaxies using the SDSS data

10. Xiaohu Yang: former graduate student; PhD thesis: The connection between galaxies and dark matter

11. Lidia Tasca: former graduate student; PHD thesis: Modeling the structural properties of galaxies using the SDSS data

12. Rigoberto Casas-Miranda: former graduate student; PhD thesis: The high-order statistics of the spatial distribution of dark halos

13. Michael Platzöder finished his Diplom (master) degree in 1996 with a thesis entitled "Statistical Analysis of Galaxy Distribution with the Help of Minkowski Functionals"

14. Weipeng Lin: Former graduate student; PhD thesis: Modeling QSO absorption line systems associated with galaxies

15. Wolfgang Salzmann finished his Diplom (master) degree in 1997 with a thesis entitled "An analytic model for the mass distribution in the infall regions around clusters"

16. Matteo Viel, a PhD student from Padova University, worked with me for about two years for his PhD project on recovering the density spectrum using QSO absorption line systems

17. Donghai Zhao, a PhD student from Shanghai Observatory, worked with me for one year on a project on the formation of dark matter halos

2.4. Postdoctoral fellows sponsored

1. Huiyuan Wang: current postdoctoral research associate

2. Xiaohu Yang: former postdoctoral research associate (2003-2005)

3. At the Max-Planck-Institute for Astrophysics (MPA) where I held a faculty position from 1995 to 2003, postdoctoral fellows were all sponsored by the institute.

3. Research and Publication

3.1. Books

1. Galaxy Formation and Evolution
   Mo, Houjun; van den Bosch, Frank C.; White, Simon, 2010, Cambridge University Press

3.2. Publication in Journals

1. Reconstructing the Cosmic Velocity and Tidal Fields with Galaxy Groups Selected from the Sloan Digital Sky Survey
   Wang, Huiyuan; Mo, H. J.; Yang, Xiaohu; van den Bosch, Frank C., 2011, arXiv1108.1008

2. An analytical model for the accretion of dark matter subhalos
   Yang, Xiaohu; Mo, H. J.; Zhang, Youcai; van den Bosch, Frank C., 2011, arXiv1104.1757

3. A Bayesian approach to the semi-analytic model of galaxy formation: methodology
   Lu, Yu; Mo, H. J.; Weinberg, Martin D.; Katz, Neal, 2011, MNRAS, tmp, 1123

4. On the algorithms of radiative cooling in semi-analytic models
   Lu, Yu; Keres Dusan; Katz, Neal; Mo, H. J.; Fardal, Mark; Weinberg, Martin D., 2011, MNRAS, tmp, 1035

5. Probing hot gas in galaxy groups through the Sunyaev-Zeldovich effect
   Li, Ran; Mo, H. J.; Fan, Zuhui; van den Bosch, Frank C.; Yang, Xiaohu, 2011, MNRAS, 413, 3039

6. nternal properties and environments of dark matter haloes
   Wang, Huiyuan; Mo, H. J.; Jing, Y. P.; Yang, Xiaohu; Wang, Yu, 2011, MNRAS, 413, 1973

7. Are brightest halo galaxies central galaxies?
   Skibba, Ramin A.; van den Bosch, Frank C.; Yang, Xiaohu; More, Surhud; Mo, Houjun; Fontanot, Fabio, 2011, MNRAS, 410, 417

8. Satellite kinematics - III. Halo masses of central galaxies in SDSS
   More, Surhud; van den Bosch, Frank C.; Cacciato, Marcello; Skibba, Ramin; Mo, H. J.; Yang, Xiaohu, 2011, MNRAS, 410, 210

9. Ages and metallicities of central and satellite galaxies: implications for galaxy formation and evolution
Pasquali, Anna; Gallazzi, Anna; Fontanot, Fabio; van den Bosch, Frank C.; De Lucia, Gabriella; Mo, H. J.; Yang, Xiaohu, 2010, MNRAS, 407, 937

10. The Stellar Mass Components of Galaxies: Comparing Semi-Analytical Models with Observation
Liu, Lei; Yang, Xiaohu; Mo, H. J.; van den Bosch, Frank C.; Springel, Volker, 2010, ApJ, 712, 734

11. Accurate Universal Models for the Mass Accretion Histories and Concentrations of Dark Matter Halos
Zhao, D. H.; Jing, Y. P.; Mo, H. J.; Brner, G., 2009, ApJ, 707, 354

12. Structural properties of central galaxies in groups and clusters
Guo, Yicheng; McIntosh, Daniel H.; Mo, H. J.; Katz, Neal; van den Bosch, Frank C.; Weinberg, Martin; Weinmann, Simone M.; Pasquali, Anna; Yang, Xiaohu, 2009, MNRAS, 398, 1129

13. Mass distribution and accretion of sub-halos
Li, Yun; Mo, Houjun, 2009, arXiv0908.0301

14. The distribution of ejected subhaloes and its implication for halo assembly bias
Wang, Huiyuan; Mo, H. J.; Jing, Y. P., 2009, MNRAS, 396, 2249

15. The Nature of Red Dwarf Galaxies
Wang, Yu; Yang, Xiaohu; Mo, H. J.; van den Bosch, Frank C.; Katz, Neal; Pasquali, Anna; McIntosh, Daniel H.; Weinmann, Simone M., 2009, ApJ, 697, 247

16. Environmental effects on satellite galaxies: the link between concentration, size and colour profile
Weinmann, Simone M.; Kauffmann, Guinevere; van den Bosch, Frank C.; Pasquali, Anna; McIntosh, Daniel H.; Mo, Houjun; Yang, Xiaohu; Guo, Yicheng, 2009, MNRAS, 394, 1213

17. The correlation of star formation quenching with internal galaxy properties and environment
Kimm, Taysun; Somerville, Rachel S.; Yi, Sukyoung K.; van den Bosch, Frank C.; Salim, Samir; Fontanot, Fabio; Monaco, Pierluigi; Mo, Houjun; Pasquali, Anna; Rich, R. M.; Yang, Xiaohu, 2009MNRAS, 394, 1131

18. Modelling galaxy-galaxy weak lensing with Sloan Digital Sky Survey groups
Li, Ran; Mo, H. J.; Fan, Zuhui; Cacciato, Marcello; van den Bosch, Frank C.; Yang, Xiaohu; More, Surhud, 2009, MNRAS, 394, 1016

19. Galaxy clustering and galaxy-galaxy lensing: a promising union to constrain cosmological parameters
Cacciato, Marcello; van den Bosch, Frank C.; More, Surhud; Li, Ran; Mo, H. J.; Yang, Xiaohu, 2009, MNRAS, 394, 929

20. Galaxy Groups in the SDSS DR4. III. The Luminosity and Stellar Mass Functions
Yang, Xiaohu; Mo, H. J.; van den Bosch, Frank C., 2009, ApJ, 695, 900

21. Reconstructing the cosmic density field with the distribution of dark matter haloes
Wang, Huiyuan; Mo, H. J.; Jing, Y. P.; Guo, Yicheng; van den Bosch, Frank C.; Yang, Xiaohu, 2009, MNRAS, 394, 398

22. The rise and fall of galaxy activity in dark matter haloes
Pasquali, Anna; van den Bosch, Frank C.; Mo, H. J.; Yang, Xiaohu; Somerville, Rachel, 2009, MNRAS, 394, 38

23. The Subhalo-Satellite Connection and the Fate of Disrupted Satellite Galaxies
Yang, Xiaohu; Mo, H. J.; van den Bosch, Frank C., 2009, ApJ, 693, 830

24. Satellite kinematics - II. The halo mass-luminosity relation of central galaxies in SDSS
More, Surhud; van den Bosch, Frank C.; Cacciato, Marcello; Mo, H. J.; Yang, Xiaohu; Li, Ran, 2009, MNRAS, 392, 801

25. Feedback from galactic stellar bulges and hot gaseous haloes of galaxies
Tang, Shikui; Wang, Q. Daniel; Lu, Yu; Mo, H. J., 2009, MNRAS, 392, 77

26. The Clustering of SDSS Galaxy Groups: Mass and Color Dependence
Wang, Yu; Yang, Xiaohu; Mo, H. J.; van den Bosch, Frank C.; Weinmann, Simone M.; Chu, Yaoquan, 2008, ApJ, 687, 919

27. On halo formation times and assembly bias
Li, Yun; Mo, H. J.; Gao, L., 2008, MNRAS, 389, 1419

28. Ongoing assembly of massive galaxies by major merging in large groups and clusters from the SDSS
McIntosh, Daniel H.; Guo, Yicheng; Hertzberg, Jen; Katz, Neal; Mo, H. J.; van den Bosch, Frank C.; Yang, Xiaohu, 2008, MNRAS, 388, 1537

29. The importance of satellite quenching for the build-up of the red sequence of present-day galaxies
van den Bosch, Frank C.; Aquino, Daniel; Yang, Xiaohu; Mo, H. J.; Pasquali, Anna; McIntosh, Daniel H.; Weinmann, Simone M.; Kang, Xi, 2008, MNRAS, 387, 79

30. Satellite Ecology: The Dearth of Environment Dependence
van den Bosch, Frank C.; Pasquali, Anna; Yang, Xiaohu; Mo, H. J.; Weinmann, Simone; McIntosh, Daniel H.; Aquino, Daniel, 2008, arXiv0805.0002V

31. Probing the intrinsic shape and alignment of dark matter haloes using SDSS galaxy groups
Wang, Yougang; Yang, Xiaohu; Mo, H. J.; Li, Cheng; van den Bosch, Frank C.; Fan, Zuhui; Chen, Xuelei 2008, MNRAS, 385, 1511

32. Galaxy Groups in the SDSS DR4. II. Halo Occupation Statistics
Yang, Xiaohu; Mo, H. J.; van den Bosch, Frank C., 2008, ApJ, 676, 248

33. Spatial and kinematic alignments between central and satellite halos
Faltenbacher, A.; Jing, Y. P.; Li, C.; Mao, S.; Mo, H. J.; Pasquali, A.; van den Bosch, F.C., 2008, ApJ, 675, 146

34. Galaxy Groups in the SDSS DR4: I. The Catalogue and Basic Properties
Yang, X.; Mo, H. J.; van den Bosch, F.C.; Pasquali, A.; Li, C.; Barden, M., 2007, ApJ, 671, 153

35. The Cross-Correlation between Galaxies of Different Luminosities and Colors
Wang, Y.; Yang, X.; Mo, H. J.; van den Bosch, F.C., 2007, ApJ, 664, 608

36. The alignment between satellites and central galaxies: theory versus observations
Kang, X.; van den Bosch, F. C.; Yang, X.; Mao, S.; Mo, H. J.; Li, C.; Jing, Y. P., 2007, MNRAS, 378, 1531

37. Three Different Types of Galaxy Alignment within Dark Matter Halos
Faltenbacher, A.; Li, C.; Mao, S.; van den Bosch, F. C.; Yang, X.; Jing, Y. P.; Pasquali, A.; Mo, H. J., 2007, ApJ, 662, L71

38. The accretion and cooling of pre-heated gas in dark matter haloes
Lu, Y.; Mo, H. J., 2007, MNRAS, 377, 617

39. Towards a concordant model of halo occupation statistics
an den Bosch, F. C.; Yang, X.; Mo, H. J.; Weinmann, S. M.; Maccio, A. V.; More, S.; Cacciato, M.; Skibba, R.; Kang, X., 2007, MNRAS, 376, 841

40. Inclination-dependent Luminosity Function of Spiral Galaxies in the Sloan Digital Sky Survey: Implications for Dust Extinction
Shao, Z.; Xiao, Q.; Shen, S.; Mo, H. J.; Xia, X.; Deng, Z., 2007, ApJ, 659, 1159

41. The Dependence of Dark Halo Clustering on Formation Epoch and Concentration Parameter
Jing, Y. P.; Suto, Yasushi; Mo, H. J., 2007, ApJ, 657, 664

42. Environmental dependence of cold dark matter halo formation
Wang, H. Y.; Mo, H. J.; Jing, Y. P., 2007, MNRAS, 375, 633

43. The Assembly History of Dark Matter Haloes
Li Y., Mo H.J., van den Bosch F.C., 2007, MNRAS, 379, 689

44. Weak lensing by galaxies in groups and clusters - I. Theoretical expectations
Yang, X.; Mo, H. J.; van den Bosch, F. C.; Jing, Y. P.; Weinmann, S. M.; Meneghetti, M., 2006, MNRAS, 373, 1159

45. Dark matter halo response to the disc growth
Choi, Jun-Hwan; Lu, Yu; Mo, H. J.; Weinberg, Martin D., 2006, MNRAS, 372, 1869

46. Properties of galaxy groups in the Sloan Digital Sky Survey - II. Active galactic nucleus feedback and star formation truncation
Weinmann, S.M.; van den Bosch, F.C.; Yang, X.; Mo, H. J.; Croton, D.J.; Moore, B., 2006, MNRAS, 372, 1161

47. The giant arc statistics in the three-year Wilkinson Microwave Anisotropy Probe cosmological model
Li, G. L.; Mao, S.; Jing, Y. P.; Mo, H. J.; Gao, L.; Lin, W. P., 2006, MNRAS, 372, L73

48. The alignment between the distribution of satellites and the orientation of their central galaxies
Yang X., Mo H.J., van den Bosch F.C., Mao S., Kang X., Weinmann S.M., Guo Y., Jing Y.P., 2006, MNRAS, 369, 1293

49. The soft X-ray properties of quasars in the Sloan Digital Sky Survey
Shen S., White S.D.M., Mo H.J., Voges W., Kauffmann G., Tremonti C., Anderson S.F., 2006, MNRAS, 369, 1639

50. An excursion set model of the cosmic web: The abundance of sheets, filaments and halos
Shen J., Abel T., Mo H.J., Sheth R., 2006, ApJ, 645, 783

51. Observational Evidence for an Age Dependence of Halo Bias
Yang X., Mo H.J., van den Bosch F.C., 2006, ApJ, 638, L55

52. The origin of cold dark matter halo density profiles
Lu Y., Mo H.J., Katz N., Weinberg M.D., 2006, MNRAS, 368, 1931

53. Properties of Galaxy Groups in the SDSS: I.– The Dependence of Colour, Star Formation, and Morphology on Halo Mass
Weinmann S.M., van den Bosch F.C., Yang X., Mo H.J., 2006, MNRAS, 372, 1161

54. Pre-heating by pre-virialization and its impact on galaxy formation
Mo H.J., Yang X., van den Bosch F.C., Katz N., 2005, MNRAS, 363, 1155

55. The cross-correlation between galaxies and groups: probing the galaxy distribution in and around dark matter haloes
Yang X, Mo H.J., van den Bosch F.C., Weinmann S.M., Li C.; Jing Y.P., 2005, MNRAS, 362, 711

56. Modeling galaxy formation with high-resolution N-body simulations
Kang X., Jing Y.P., Mo H.J., Boerner G., 2005, ApJ, 631, 21

57. The Phase-Space Parameters of Brightest Halo Galaxies
van den Bosch F.C., Weinmann S.M., Yang X., Mo H.J., Li C., Jing Y.P., 2005, MNRAS, 361, 1203

58. Galaxy occupation statistics of dark matter haloes: observational results
Yang, X., Mo, H. J., Jing, Y. P., van den Bosch, F.C., 2005, MNRAS, 358, 217

59. Optical and Near-Infrared Color Profiles in Nearby Early-Type Galaxies and the Implied Age and Metallicity Gradients
Wu, H., Shao, Z., Mo, H. J., Xia X., Deng Z., 2005, ApJ, 622, 244

60. The two-point correlation of galaxy groups: probing the clustering of dark matter haloes
Yang, X., Mo, H.J., van den Bosch, F.C., Jing, Y. P., 2005, MNRAS, 357, 608

61. A halo-based galaxy group finder: calibration and application to the 2dFGRS
Yang, X., Mo, H. J., van den Bosch, F. C., Jing, Y. P., 2005, MNRAS, 356, 1293

62. The abundance and radial distribution of satellite galaxies
van den Bosch, F.C., Yang, X., Mo H. J., Norberg P., 2005, MNRAS. 356, 1233

63. An Analytic Model of Galactic Winds and Mass Outflows
Shu C., Mo H.J., Mao S., 2005, ChJAA, 5, 327S

64. Galaxy formation in pre-processed dark haloes
Mo H. J., Mao S., 2004, MNRAS, 353, 829

65. The three-point correlation function of galaxies: comparing halo occupation models with observations
Wang Y., Yang X., Mo H. J., van den Bosch F.C., Chu Y., 2004, MNRAS, 353, 287

66. Probing dark matter haloes with satellite kinematics
van den Bosch, F.C., Norberg P., Mo H.J., Yang X., 2004, MNRAS, 352, 1302

67. On Departures From a Power Law in the Galaxy Correlation Function
Zehavi, I. et al., 2004, ApJ, 608, 16

68. Populating dark matter haloes with galaxies, mock catalogues from N-body simulations
Yang X.H., Mo H.J., Jing Y.P., van den Bosch F., Chu Y., 2004, MNRAS, 350, 1153

69. The dependence of the galaxy luminosity function on large-scale environment
Mo H. J., Yang X., van den Bosch F.C., Jing Y.P., 2004, MNRAS, 349, 205

70. Towards Cosmological Concordance on Galactic Scales
van den Bosch F., Mo H.J., Yang X.H., 2003, MNRAS, 345, 923

71. The size distribution of galaxies in the Sloan Digital Sky Survey
Shen, S., Mo, H.J., White S.D.M., Blanton, M.R., Kauffmann, G., Voges W., Brinkmann, J., Csabai I., 2003, MNRAS, 343, 978S

72. Linking Early and Late Type Galaxies to their Dark Matter Haloes
van den Bosch F., Yang X.H., Mo H.J., 2003, MNRAS, 340, 771

73. The growth and structure of dark matter haloes
Zhao, D.H; Mo H.J.; Jing, Y. P.; Brner, G., 2003, MNRAS, 339, 12

74. Constraining Galaxy Formation and Cosmology with the Conditional Luminosity Function of Galaxies
Yang, X.; Mo, H.J.; van den Bosch, F.C., 2003, MNRAS, 339, 1057

75. Understanding the Results of Galaxy-Galaxy Lensing using Galaxy-Mass Correlation in Numerical Simulations
Yang, X.; Mo, H.J.; Kauffmann, G.; Chu, Y., 2003, MNRAS, 339, 387

76. Modelling the IGM and the Lyalpha forest at high redshift from the dark matter distribution
M. Viel, S. Matarrese, H.J. Mo, Tom Theuns, M.G. Haehnelt, 2002, MNRAS, 336, 685

77. Testing Theoretical Models for the Higher-Order Moments of Dark Halo Distribution
R. Casas-Miranda, H.J. Mo, G. Boerner, 2003, MNRAS, 339, 872

78. The abundance and clustering of dark haloes in the standard Lambda CDM cosmogony
H. J. Mo, S.D.M. White, 2002, MNRAS, 336, 112

79. An analytic model for the non-linear redshift-space power spectrum
X. Kang, Y. P. Jing, H. J. Mo, G. Borner, 2002, MNRAS, 336, 892

80. On the distribution of haloes, galaxies and mass
Casas-Miranda, R.; Mo, H. J.; Sheth, Ravi K.; Boerner, G. 2002, MNRAS, 333..730

81. Galaxy formation in pre-heated intergalactic media
Mo, H. J.; Mao, Shude 2002 , MNRAS, 333..768

82. Galaxy Clustering in Early Sloan Digital Sky Survey Redshift Data
Zehavi, I; Blanton, M.; Frieman, J.; Weinberg, D.; Mo, H.J. et al 2002, ApJ, 571..172

83. The fundamental plane of spiral galaxies: theoretical expectations
Shen, Shiyin; Mo, H. J.; Shu, Chenggang 2002, MNRAS, 331..259

84. Probing the IGM with the Lyα forest along multiple lines of sight to distant QSOs
Viel, M.; Matarrese, S.; Mo, H. J.; Haehnelt, M. G.; Theuns, Tom 2002, MNRAS, 329..848

85. Sloan Digital Sky Survey: Early Data Release
Stoughton, Chris; Lupton, Robert H. et al. 2002, AJ, 123, 485

86. The host haloes of Lyman-break galaxies and submillimetre sources
Shu, Chenggang; Mao, Shude; Mo, H. J. 2001, MNRAS, 327..895

87. Constraining cosmological parameters with the clustering properties of galaxy clusters in optical and X-ray bands
Moscardini, L.; Matarrese, S.; Mo, H. J. 2001, MNRAS, 327..422

88. Ellipsoidal collapse and an improved model for the number and spatial distribution of dark matter haloes
Sheth, Ravi K.; Mo, H. J.; Tormen, Giuseppe 2001, MNRAS, 323....1

89. Observational signatures of feedback in QSO absorption spectra
Theuns, Tom; Mo, H. J.; Schaye, Joop 2001, MNRAS, 321..450

90. Low-redshift quasar Lyman alpha absorption-line systems associated with galaxies
Lin, W. P.; Boerner, G.; Mo, H. J. 2000, MNRAS, 319..517

91. The Tully-Fisher relation and its implications for the halo density profile and self-interacting dark matter
Mo, H. J.; Mao, Shude 2000, MNRAS, 318..163

92. Observational constraints on disc galaxy formation
Syer, D.; Mao, Shude; Mo, H. J. 1999, MNRAS, 305..357

93. The structure and clustering of Lyman-break galaxies
Mo, H. J.; Mao, Shude; White, Simon D. M. 1999, MNRAS, 304..175

94. The nature of the host galaxies for gamma-ray bursts
Mao, Shude; Mo, H. J. 1998, A&A, 339..1

95. The evolution of galactic discs
Mao, Shude; Mo, H. J.; White, Simon D. M. 1998, MNRAS, 297L..71

96. On the physical connections between galaxies of different types
Mao, Shude; Mo, H. J. 1998, MNRAS, 296..847

97. The formation of galactic discs
Mo, H. J.; Mao, Shude; White, Simon D. M. 1998, MNRAS, 295..319

98. Spatial Correlation Function and Pairwise Velocity Dispersion of Galaxies: Cold Dark Matter Models versus the Las Campanas Survey
Jing, Y. P.; Mo, H. J.; Boerner, G. 1998, ApJ, 494....1

99. A "Minihalo" Model for the Lyman Limit Absorption Systems at High Redshift
Abel, Tom; Mo, H. J. 1998, ApJ, 494L.151

100. Analytical approximations to the low-order statistics of dark matter distribution
Mo, H. J.; Jing, Y. P.; Borner, G. 1997, MNRAS, 286..979

101. High-order correlations of peaks and haloes: a step towards understanding galaxy biasing
Mo, H. J.; Jing, Y. P.; White, S. D. M. 1997, MNRAS, 284..189

102. Gaseous Galactic Halos and Quasi-stellar Object Absorption-Line Systems
Mo, H. J.; Miralda-Escude, J. 1996, ApJ, 469..589

103. The correlation function of clusters of galaxies and the amplitude of mass fluctuations in the Universe
Mo, H. J.; Jing, Y. P.; White, S. D. M. 1996, MNRAS, 282.1096

104. An analytic model for the spatial clustering of dark matter haloes
Mo, H. J.; White, S. D. M. 1996, MNRAS, 282..347

105. Constraints on the Cosmic Structure Formation Models from Early Formation of Giant Galaxies
Mo, H. J.; Fukugita, M. 1996, ApJ, 467L...9

106. The evolution of correlation functions and power spectra in gravitational clustering
Jain, B.; Mo, H. J.; White, S. D. M. 1995, MNRAS, 276L..25

107. Substructures and density profiles of clusters in models of galaxy formation
Jing, Y. P.; Mo, H. J.; Borner, G.; Fang, L. Z. 1995, MNRAS, 276..417

108. Lyman-Alpha Absorption at Low Redshifts and Hot Gas in Galactic Haloes
Mo, H. J. 1994, MNRAS, 269L..49M

109. Damped Lyman-alpha systems and galaxy formation
Mo, H. J.; Miralda-Escude, J. 1994, ApJ, 430L..25

110. The Sources of Lyman-Alpha Absorption at Low Redshifts - Galaxies Haloes and Minihaloes
Mo, H. J.; Morris, S. L. 1994, MNRAS, 269...52

111. The distribution of IRAS galaxies on linear and nonlinear scales
Sheth, Ravi K.; Mo, H. J.; Saslaw, William C. 1994, ApJ, 427..562

112. The large-scale structure in a universe dominated by cold plus hot dark matter
Jing, Y. P.; Mo, H. J.; Boerner, G.; Fang, L. Z. 1994, A&A, 284..703

113. Spatial distribution of low-surface-brightness galaxies
Mo, H. J.; McGaugh, Stacy S.; Bothun, Gregory D. 1994, MNRAS, 267..129

114. The Distribution of Minihaloes in Cold Dark Matter Cosmogony
Mo, H. J.; Miralda-Escude J.; Rees, M. J. 1993, MNRAS, 264..705

115. On the Pairwise Velocity Dispersion of Galaxies
Mo, H. J.; Jing, Y. P.; Borner, G. 1993, MNRAS, 264..825

116. The cluster-cluster correlation in hybrid models
Jing, Y. P.; Mo, H. J.; Boerner, G.; Fang, L. Z. 1993, ApJ, 411..450

117. Quasar clustering on large scales
Mo, H. J.; Fang, L. Z 1993, ApJ, 410..493

118. Do Galactic Potential Wells Depend on Their Largescale Environment
Mo, H. J.; Lahav, O. 1993, MNRAS, 261..895

119. The clustering of QSOs at low redshift
Boyle, B. J.; Mo, H. J. 1993, MNRAS, 260..925

120. The cross-correlation of IRAS galaxies with Abell clusters and radio galaxies
Mo, H. J.; Peacock, J. A.; Xia, X. Y. 1993, MNRAS, 260..121

121. On the error estimates of correlation functions
Mo, H. J.; Jing, Y. P.; Boerner 1992, ApJ, 392..452

122. Typical scales in the distribution of galaxies and clusters of galaxies from unnormalized pair counts
Mo, H. J.; Deng, Z. G.; Xia, X. Y.; Schiller, P.; Boerner, G. 1992, A&A, 257....1

123. Can morphological segregation of galaxies exist on 10/h MPC scales?
Mo, H. J.; Einasto, M.; Xia, X. Y.; Deng, Z. G. 1992, MNRAS, 255..382

124. Characteristic scales in the distribution of QSO absorption line systems
Mo, H. J.; Xia, X. Y.; Deng, Z. G.; Boerner, G.; Fang, L. Z. 1992, A&A, 256L..23

125. Probing pencil beams in pancake models
Buchert, T.; Mo, H. J. 1991, A&A, 249..307

126. The cellular structure of the universe and cosmological tests
Feng, Long L.; Mo, H.J.; Ruffini, R. 1991, A&A, 243..283

127. Percolation analysis and void probability functions of galaxies with different morphological type
Mo, H. J.; Boerner, G. 1990, A&A, 238....3

128. Statistical discriminator among galaxy samples of different large-scale topology and geometry
Mo, H. J.; Buchert, T 1990, A&A, 234....5

129. On the two-point correlations of galaxies in the CfA survey
Boerner, G.; Mo, H. J. 1990, A&A, 227..324

130. Geometrical analysis of galaxy clustering - Dependence on luminosity
Boerner, Gerhard; Mo, H. J. 1989, A&A, 223...25

131. A percolation analysis of cluster superclustering
Boerner, G.; Mo, H. J. 1989, A&A, 224....1

132. Correlation functions of galaxies with different weightings according to luminosity and mass
Boerner, G.; Mo, H. J. Zhou, Youyuan 1989, A&A, 221..191

133. Richness-dependence of cluster-cluster correlations
Boerner, Gerhard; Mo, Houjun; Chu, Yaoquan 1989, A&A, 219...29

134. Secondary effects of cosmic string
Mo, Hou-Jun, 1989, SCSMP, 32, 328

135. Aspherical accretion of cosmic strings
Mo, H. J.; Gao, B.; Fang, L. 1987, Ap&SS, 137..225

136. Cosmic wavefunction with induced gravity
Mo, H. J.; Fang, L. Z. 1988, Phy. Lett., B201, 321

137. Wavefunction of a rotating universe
Fang, L. Z.; Mo, H. J. 1987, Phy. Lett., B186, 297

138. Isotropy of background radiation in a multiply connected universe
Fang, L. Z.; Mo, H. J. 1987, Mod. Phys. Lett., A2, 229

139. Self-affinity of the large scale structure of the universe
Fang, L. Z.; Mo, H. J.; Bi H. G. 1987, Mod. Phys. Lett., A2, 473

3.3. Publication in Proceedings

1. Establishing the relationship between galaxies and dark matter
Mo, H. J.; Yang, X. H.; van den Bosch, F. C.; Jing, Y. P.; Weinmann, S. M., 2007, in Galaxy Evolution Across the Hubble Time, Edited by F. Combes and J. Palous, Proceedings of the International Astronomical Union 2, IAU Symposium 235, 2006 Prague. Cambridge University Press, 2007., pp.43-47

2. The origin of cold dark matter halo density profiles
Mo, H. J., 2006, in EAS Publications Series, Volume 20, 2006, pp.51-54

3. The soft X-ray properties of quasars in the Sloan Digital Sky Survey
Shen, S.; White, S.; Mo, H. J.; Voges, W.; Kauffmann, G.; Tremonti, C.; Anderson, S. F., 2006, 36th COSPAR Scientific Assembly. Beijing, CDROM, 1866

4. Weak lensing by galaxies in galaxy groups
Yang, X.; Mo, H. J.; van den Bosch, F. C., 36th COSPAR Scientific Assembly. Beijing, China. CDROM, 524

5. Cold gas in dark matter halos and the formation of late-type galaxies
Mo H.J., Yang X., van den Bosch F.C., Katz N.S., 2005, in Probing Galaxies through Quasar Absorption Lines, IAU Colloquium 199, Shanghai 2005. Eds.: P.R. Williams, C. Shu and B. Menard, Cambridge Univ. Press, Cambridge 2005, p205

6. The origin of CDM halo density profiles
Mo H.J., 2005, in Mass Profiles and Shapes of Cosmological Structures, 21st IAP Colloquium, Paris 2005. Eds.: G.A. Mamon, F. Combes, C. Deffayet, B. Fort, EDP Sciences Publisher, 2005

7. Low-redshift quasar absorption-line systems: inside and around galaxies
Lin W., Börner G., Mo H.J., 2005, in Probing Galaxies through Quasar Absorption Lines, IAU Colloquium 199, Shanghai 2005. Eds.: P.R. Williams, C. Shu and B. Menard, Cambridge Univ. Press, Cambridge 2005, p231

8. The galaxy-dark matter connection
van den Bosch, F., Yang X., Mo H. J., 2004, in: Baryons in Dark Matter Halos, Novigrad, Croatia, 2004. Eds: R. Dettmar, U. Klein, P. Salucci. Proceedings of Science, p.41.1

9. Galaxy Distribution from High-Res Cosmological Simulations
Jing Y., Kang X., Mo H.J., Boerner G., 2003, in IAU Symposium 216, Sydney, IAUS, 216, E7

10. Halo and Galaxy Bias
Casas-Miranda, R., Mo, H. J., Sheth, R.K., Boerner, G., 2002, in 11th UN/ESA Workshop on Basic Space Sciences, Cordoba, Argentina, 2002, BSS. Conf.E, 23

11. The host haloes of Lyman break galaxies
Shu C., Mao S., Mo H.J.,, 2001, in Progress in Astronomy, Vol. 19, Supp., p101

12. The origin of the Tully-Fisher relation
Mo, H. J., Mao, S., 2001, in Progress in Astronomy, Vol. 19, Supp., p. 84

13. Formation and evolution of galaxies
Mo, H., 2001, in Progress in Astronomy, Vol. 19, Supp., p. 112

14. Clustering Properties of Galaxy Clusters in Present and Future Surveys
Moscardini L., Matarrese S., Andreani P., Bartelmann M., Mo, H.J., in Tracing Cosmic Evolution with Galaxy Clusters. ASP Conference Proceedings, Vol. 268. Eds: S. Borgani, M. Mezzetti, and R. Valdarnini., ASP, 2002. p.86

15. Cosmological Formation of Disk Galaxies
Mo, H. J., Mao, S., 2000, in Dynamics of Galaxies: from the Early Universe to the Present, Paris, Eds.: F. Combes, G.A. Mamon, and V. Charmandaris, ASP 197, p.145.

16. The formation and evolution of disk galaxies
Mo H.J., in: IAP conference on Galactic Dynamics, Paris, 1999 eds. F. Combes et al., ASP Series, Vol. 197, p145

17. The Formation and Evolution of Disk Galaxies
Mao S., Mo H.J., 1999, in From Stars to Galaxies to the Universe, Tegernsee 1998. Eds: G. Boerner, H. Mo., p.116

18. Gaseous galactic halos and QSO absorption line systems
Mo H.J., in: UC Santa Cruz Workshop on Galactic Halos, 1998, eds. D. Zarisky, ASP Series, Vol. 136, p178

19. Precision measurements from the Las Campanas survey-two-point, three-point correlation functions and the pairwise velocity of galaxies
Boerner G., Jing Y.P., Mo H.J., 1999, in Dark matter in astrophysics and particle physics, Heidelberg, eds: H.V. Klapdor-Kleingrothaus and L. Baudis. Institute of Physics Pub., 1999., p.315

20. Precision measurements from the Las Campanas Suryey – two-point, three point correlation functions and the pairwise velocity dispersion of galaxies
Boerner G., Jing Y.P., Mo H.J., 1998, in Bulletin of the American Astronomical Society, Vol. 30, p.1244

21. Global stability and the mass-to-light ratio of galactic disks
Syer, D.; Mao, S.; Mo, H. J., 1998, in Dynamics of Galaxies and Galactic Nuclei, Heidelberg, Eds: W.J. Duschl and C. Einsel, p. 103.

22. Spatial Correlation Function and Pairwise Velocity Dispersion of Galaxies: CDM Models versus the Las Campanas Survey
Boerner, G.; Jing, Y. P.; Mo, H. J., 1998, in Large Scale Structure: Tracks and Traces. Potsdam, Eds. V. Mueller, S. Gottloeber, J.P. Muecket, J. Wambsganss, World Scientific 1998, p. 107-110.

23. Analytical approximations to galaxy clustering
Mo H.J., in: Ringberg Workshop on The Evolving Universe, 1997 ed. D. Hamilton, Kluwer, p343

24. Constraints on the cosmic structure formation models from early formation of galaxies
Mo H.J., In: The 21st Century Chinese Astronomy, Hong Kong 1996, eds. K.S. Cheng, K.L. Chan. World Scientific, Singapore 1997, 453–456.

25. Constraining galaxy formation models by observations of damped Lyman alpha systems
Mo, H.J. and J. Miralda-Escude: In: Large Scale Structure in the Universe, Potsdam 1994, Eds. J.P. Mücket et al. World Scientific, Singapore 1995, 268–272.

26. QSO Absorption line systems as pressure-confined clouds in galactic haloes
Mo, H.J.: In: ASO Absorption Lines. Proc. of the ESO Workshop Garching 1994, Ed. G. Meylan. Springer, Berlin 1995, 445–446.

27. Analytical approximations to the large-scale gravitational clustering
Mo, H.J., Jing Y.P., Börner G., In: Astrophysics Reports., Proc. of the Hangzhou Workshop on Cosmology at High and Low Redshift., Ed. Z.G. Deng and Z.L. Zou. Publications of the Beijing Astron. Obs. Special Issue, No. 2, 1997, 15–42.

28. Constraining galaxy formation models by damped Lyman alpha systems
Mo, H.J., Miralda-Escude J., In: Astrophysics Reports., Proc. of the Nandaihe Workshop on The Formation and Evolution of Galaxies., Ed. Z.L. Zou et al. Publications of the Beijing Astron. Obs. Special Issue, No. 1, 1995, 22–26.

29. Cosmological structure formation in hot and cold dark matter scenarios
Börner G., Mo H.J., Jing Y.P., In: Galaxies in the Young Universe. Proc. Workshop Ringberg Castle 1994, Ed. H. Hippelein et al. Springer, Berlin 1995, 21–50.

30. Substructurres of clusters and cosmological models
Jing, Y.P., H.J. Mo, G. Börner, L.Z. Fang: In: Large Scale Structure in the Universe, Potsdam 1994, Eds. J.P. Mücket, S. Gottlöber, V. Müller. World Scientific, Singapore 1995, 232–236.

31. Cosmological structure formation in hot and cold DM scenarios
Börner G., Mo, H.J., Jing Y.P., In: Astrophysics Reports. Proc. of the Nandaihe Workshop on The formation and evolution of galaxies. Ed. Z.L. Zou et al. Publications of the Beijing Astron. Obs. Special Issue, No. 1, 1995, 27–58.

32. Topology of the universe
Fang, L.Z. & Mo, H.J. 1987, in IAU Symposium 124, 461.

3.4. Invited talks at international conferences

1. A Bayesian approach to the semi-analytic model of galaxy formation, The second Galileo - Xu Guangqi meeting Ventimiglia, Italy 2010

2. Galaxy formation, an overview: invited talk, China TMT workshop, Beijing 2009

3. The formation and structure of CDM halos, invited talk, Santa Cruz Galaxy Workshop, 2009

4. Galaxy groups and cosmology, invited talk, The 1st Galileo-Xu Guangqi Conference, Shanghai 2009

5. The formation and structure of dark matter halos, keynote talk, Galaxy Growth in a Dark Universe, Heidelberg 2007

6. The galaxy-dark matter connection, keynote talk, Galaxy formation in the local and high-redshift universe, Lijiang, 2007

7. Establishing the relationship between galaxies and dark matter: invited talk, IAU Symposium No 235, Galaxy evolution across the Hubble time, Prague, 2006

8. Killing dwarf galaxies with hot pancakes, invited talk, Galaxies in the Cosmic Web, Las Cruces, 2006

9. Cold gas in dark halos and the formation of late-type galaxies, invited talk, IAU colloquium 199, Shanghai, 2005

10. The origin of cold dark matter halo profiles, invited talk, 21st IAP Colloquium, Paris, 2005

11. Galaxy formation in preheated media, invited talk, Eibsee, 2001

12. The nature of high-redshift galaxies, invited talk, Asiago, 2000

13. Analytical approximation to galaxy clustering, invited talk Ringberg, 1998

14. Gaseous galaxy halos and QSO absorption line systems, invited talk, Santa Cruz, 1997

3.5. Contributed talks at international conferences

1. The clustering of dark matter halos, Aspen, 2002
2. Cosmological formation of disk galaxies, IAP Colloquium, Paris, 2000
3. The formation of galaxy disks, UC Santa Barbara, 2000
4. The formation and evolution of disk galaxies, Ringberg, 1998
5. High-redshift galaxies and galaxy formation, Hong Kong, 1996

3.6. Invited talks at other institutions

1. Bayesian galaxy formation, KIPAC, Stanford University, 2011
2. The formation and structure of dark matter halos KIPAC, Stanford University, 2011
3. A Bayesian approach to the semi-analytical model of galaxy formation, Institute of Astronomy, Cambridge University, 2011
4. A Baysian approach to galaxy formation, University of Durham, UK, 2011
5. The structure and formation of dark matter halos, Max-Planck-Institute for Astrophysics, Garching, Germany, 2011
6. A Bayesian approach to the semi-analytical model of galaxy formation, KIAA, Peking University, 2011
7. Bayesian galaxy formation, National Observatory of China, 2011
8. Galaxy formation, a Baysian approach, colloquium, Department of Astronomy, University of Barcelona, 2010
9. The galaxy-dark matter connection, Astronomy Department, University of Maryland, 2008
10. The relationship between galaxies and dark matter, Institute of Astronomy, Academia Sinica, Taipei, 2007
11. Cosmology and galaxy formation, Yunan University, Kunmin 2007
12. The relationship between galaxies and dark mater halos, Astronomy Department, Columbia University, 2006

13. The galaxy-dark matter connection, KITP, Santa Barbara, 2006
14. The galaxy-dark matter connection, Astronomy Department, Univ. of California at Berkeley, 2006
15. The galaxy-dark matter connection, Astronomy Department, Queen's Univ., Kingston, 2006
16. The connection between dark halos and galaxies, Max-Plank-Institut für Astronomie, 2005
17. Linking galaxies with dark matter halos, University of Pennsylvania, 2005
18. The connection between galaxies and dark halos, Harvard, 2004
19. Linking galaxies with dark matter halos, MIT, 2004
20. Modeling galaxy clustering in the universe, Univ. of Massachusetts, 2002
21. Galaxy formation and evolution, Beijing Obs., 2002
22. The formation of galaxies in CDM cosmogony Shanghai Obs., 2001
23. The formation of disk galaxies, Padova Univ., 2000
24. The origin of the scaling relations of disk galaxies, Padova Univ., 1999
25. The formation and evolution of disk galaxies, Heidelberg, 1999
26. The properties of damped Lyman alpha systems, UC San Diego, 1999
27. The properties of Lyman break galaxies, CalTech, 1999
28. The formation of disk galaxies, Roma Univ., 1998
29. The formation of disk galaxies, Munich Univ., 1998
30. An analytical model of dark matter clustering, Edinburgh Univ., 1997
31. The clustering of dark matter and dark matter halos, Univ. of Arizona, 1996
32. Gaseous galaxy halos and QSO absorption line systems, Stony Brook, 1995
33. The clustering of dark halos and bias, Space Telescope Science Institute, 1995
34. Galaxy clustering and bias, Univ. of Illinois, 1995
35. Damped Lyman alpha systems and galaxy formation, Potsdam, 1995

3.7. Grants and Sponsored Activities

- Current: Probing galaxy-formation physics: a Bayesian inference approach
  PI: Houjun Mo (Co-I: Weinberg)
  Total Request: $352,000
  Dates: 9/1/11 - 8/31/14
  Source: NASA ATFP

- Current: Reconstructing the dark matter distribution to simulate the local intergalactic medium
  PI: Houjun Mo (Co-Is: Katz, Tripp)
  Total Request: $428,000
  Dates: 9/1/09 - 8/31/12
  Source: NASA ATFP

- Past: The Large-Scale Distribution and Physical Properties of Gas in the Cosmic Web
  PI: Tripp (Co-Is: Katz, Mo)
  Total Request: $192,316
  Dates: 6/1/08 - 5/31/10
  Source: NASA ADP

- Past: Suppressing Dwarf Galaxy Formation with Gravitational Pancakes
  PI: Houjun Mo (Co-I: N. Katz)
  Total Amount: $292,905
  Dates: 7/15/06 - 7/14/09
  Source: NSF Extragalactic

- Past: Enabling Bayesian inference for the astronomy masses
  PI: Martin Weinberg (Co-Is: N. Katz, H.J. Mo and E. Moss)
  Total Amount: $714,101
  Dates: 3/15/06 - 3/14/09
  Source: NASA AISR

- Past: High-performance Computational Bayesian Inference
  PI: Martin Weinberg (Co-Is Katz, Mo, Moss)
  Total Request: $771,900
  Dates: 7/15/06 - 7/14/09
  Source: NSF SEIII

- Past: Graduate Scholarship Program
  Sponsors: Zuhui Fan (Peking Univ.) and Houjun Mo

Total Awarded: $24,000
Source: Chinese Ministry of Education
Purpose: To support an exchange student to UMass for 2 years

- Past: Group collaboration: "Galaxy formation and evolution"
  PI: Yipeng Jing (Shanghai)
  Total Awarded: RMB 5,000,000 (about $700,000
  Dates: 10/1/2002 - 9/30/2007
  Source: Chinese Academy of Sciences
  Purpose: To support joint research in the field of galaxy formation and cosmology. This has led to the publications of more than 30 papers, of which Houjun Mo is an co-author for 25.

- Past: Astrophysics research grant
  PI: Houjun Mo
  Total amount: $3,000
  Purpose: To purchase a desktop computer for storing and publicly releasing the data produced by the project: "The relationship between galaxies and dark matter".

- Past: MPA participation of the Sloan Digital Sky Survey
  PI: Simon White
  Total amount: 1,000,000 Euro
  Purpose: This contribution made MPA an official participant of the Sloan Digital Sky Survey, and the data right was granted to the two official participants (Simon White and Houjun Mo) and up to six postdoctoral researchers and students.

- Past: Outstanding Young Overseas Chinese Grant
  PI: Houjun Mo
  Total amount: RMB 400,000 (about $50,000)
  Dates: 10/1/1999 - 9/30/2002
  Source: National Sciences Foundation of China
  Purpose: To support collaboration with National Astronomical Observatory, Beijing, China, on a project, "The structural properties of nearby galaxies".

4. SERVICES

4.1. Campus and University

- Department merit committee, UMass, 2011-2012
- Graduate program committee, 2007 -
- Graduate admission committee, 2007 - 2010
- Faculty senate, 2007 -
- Department-head search committee, 2007
- Department personnel committee, UMass, 2006-2007
- Department personnel committee, UMass, 2005-2006
- Department personnel committee, UMass, 2004-2005
- Department merit committee, UMass, 2004-2005
- Department faculty search committee, UMass, 2006
- Department faculty search committee, UMass, 2004
- Chair, Department Colloquium, UMass, 2004-2005
- Chair, first-year project exam committee, 2005
- member, second-year project exam committee, 2004
- member, first-year project exam committee, 2006
- member, second-year project exam committee, 2005
- PhD thesis committees, UMass (so far on 7 committees in astronomy and physics)
- Organizer of the weekly Institute Seminar at the Max-Planck-Institut für Astrophysik (MPA) 1999-2003
- MPA CoCo (Collaboration Council) representative, the Sloan Digital Sky Survey, 2001-2003
- MPA chairman and contact person for the International Max-Planck Research School, 2001-2003

- PhD thesis committee member at the MPA, 1999-2003
- Member of selection committee for postdoctoral fellows at the MPA, 1999-2003
- MPA contact person of the Cosmology Partner Group in Shanghai
- Organizer of the weekly Cosmology Seminar, 1996 - 2001

4.2. Service to profession

- Editor, International Journal of Modern Physics D, Gravitation, Astrophysics and Cosmology, 2007-2009
- Referee for leading international astronomical journals, MNRAS, ApJ, ApJ Letters, AJ, A&A
- Key projects reviewer, Chinese Academy of Sciences
- Reviewer, Israeli National Science Foundation
- Research proposal referee, Padova University, Italy
- Scientific Organizing Committee, Cosmic Re-ionization - the Formation and Evolution of Stars, Galaxies and Black Holes, Beijing, 2008
- Scientific Organizing Committee, IAU Colloquium 199, 2005
- Scientific Organizing Committee, 'Cosmology in the New Millennium', Shanghai 2000
- Local Organizing Committee, 'The Evolution of Large-Scale Structure', Garching 1998
- Local Organizing Committee, 'From Stars to Galaxies to the Universe', Ringberg 1998
- Member, International Astronomical Union
- Member, European Research and Training Network / Galaxy Formation and Evolution, 1998 - 2001
- Member, European Research and Training Network / Intergalactic Medium, 2001 - 2003
- Member, Special Research Area (astroparticle physics), German Research Foundation

4.3. Highlights of Past Research

Spatial clustering of dark matter halos: My main contribution here is the development of an analytical model for the spatial clustering of dark haloes. The results were published in Mo & White (1996). This model has been used extensively to study the clustering properties of galaxies and clusters of galaxies. Together with the model for the high-order moments of the halo distribution developed by Mo, Jing & White (1997), it provides the basis for what is now known as the 'halo occupation model' of the galaxy clustering.

Formation of disk galaxies: My main contribution here is the development of a model of disk galaxy formation in a cosmological context. The results were published in Mo, Mao & White (1998), and the model has been widely adopted in the field of galaxy formaiton.

Improving the Press-Schechter formalism: Sheth, Mo & Tormen (2001) extended the widely-used Press-Schechter formalism by incorporating ellipsoidal collapse, and showed that the resulting mass function and halo bias are much more accurate than the original Press-Schechter formalism. This extension not only provides a more accurate model for the mass and correlation functions of dark matter halos, but also allows one to model how the formation of dark matter halos depends on the large-scale environment.

The galaxy - dark matter halo connection: Jing, Mo & Börner (1998) were the first to introduce the concept of what is now called the 'halo-occupation' model of galaxy bias. They showed that such a bias is required in order for the current CDM cosmology to match the observed galaxy clustering on small scales. Together with my former postdoc and (Xiaohu Yang, Shanghai Observatory) and my collaborator, Frank van den Bosch (Max-Planck-Institute of Astronomy, Heidelberg), I extended the halo occupation model by incorporating the dependence on galaxy luminosity and color. This extension is now referred to as the conditional luminosity function (CLF) model in the literature. In the last couple of years, the halo-occupation/CLF model has been widely adopted in the study of the relationship between dark halos and galaxies. My collaboration group has made a major contribution to the research in this area.

Galaxy groups and the properties of galaxies dark matter halos: During the past two years, I and my collaborators (Xiaohu Yang and Frank van den Bosch) have embarked on a reasearch program to understand how galaxies form in dark matter halos as represented by galaxy groups selected from large redshift surveys. We developed a very successful group finder which can group galaxies together according to their common halos. We have applied the group finder to the 2-degree Galaxy Redshift Survey (2dFGRS) and the Sloan Digital Sky Survey (SDSS), and have made our group catalogs publicly available to the whole community.

These catalogs allowed us to carry out, for the first time, a systematic analysis about how the properties of galaxies are affected by their host halos. So far, this program has produced more than 20 published papers and many more are to come.

Clustering of high-redshift galaxies: Mo & Fukugita (1996) was the first to predict that the Lyman-break galaxies observed at redshift $z \sim 3$ should be highly biased relative to the underlying mass. These results have been confirmed by various recent observations and theoretical modelling. The idea of using the observed number density and clustering strength of high-redshift galaxies to infer the masses of their host halos has since been widely adopted in the interpretation of the data on high-redshift galaxies.

Galaxy pairwise velocity dispersion: Mo, Jing & Börner (1993) were the first to find that the pairwise velocity dispersion (PVD) of galaxies (for which earlier analysis gave a very low value, which was the main reason for the introduction of a high level of bias in the CDM cosmogony) is very sensitive to the presence (or absence) of rich clusters in a sample and the samples used in earlier studies were too small to give a fair estimate of this quantity. This conclusion has since been confirmed by many other authors. Jing, Mo & Börner (1998) were the first to obtain a reliable value of the PVD from the Las Campanas Redshift Survey and show that the prediction of the current ΛCDM model is consistent with observational data. These results were subsequently confirmed by recent results based on the 2dFGRS and the SDSS.

QSO absorption line systems: Mo (1994) and Mo & Miralda-Escude (1996) developed a model in which QSO absorption line systems associated with galaxies are assumed to be produced by pressure-confined gas clouds in dark mater halos. More recently, a number of numerical simulations show that this model may also describe how galaxies accrete the cooling gas from their dark matter halos.

The formation and structure of CDM halos: In Zhao, Mo, Jing & Börner (2003), it was found that the build-up of dark halos in current CDM models generally consists of an early phase of fast accretion followed by a phase of slow accretion. Halos in the two accretion phases show systematically different properties. Subsequently, in Lu, Mo, Katz & Weinberg (2006), it is shown that such formation histories may play an important role in generating the universal halo density profile observed in cosmological N-body simulations. The results obtained by Lu et al. may provide important clue about the origin of the CDM dark matter halo profiles.

Galaxy formation in preheated media: Mo & Mao (2002) proposed that early star formation and AGN activities may heat the intergalactic medium to a finite temperature, and subsequent galaxy formation is in a preheated medium. This can have significant impact

on the gas cooling and accretion in galaxy halos. In particular, the hierarchical nature of clustering may be reversed in the gas component, as the effect is larger for smaller halos. Mo, Yang, van den Bosch & Katz (2005) proposed a preheating model where the medium around low-mass haloes is preheated by gravitational pancaking. We demonstrated that the progenitors of present-day dark matter haloes with $M \lesssim 10^{12}h^{-1}\mathrm{M}_{\odot}$ were embedded in pancakes of masses $\sim 5\times10^{12}h^{-1}\mathrm{M}_{\odot}$ at $z \sim 2$. The formation of such pancakes may heat the gas to a temperature of 5×10^5K, almost exactly the amount required to explain the stellar and HI mass functions. These models may have the potential to solve the problem that star formation in low-mass dark matter halos may be too efficient to match the observed galaxy luminosity function at the faint end.

Large-scale clustering of low-surface brightness galaxies: Mo, McGaugh, Bothun (1994) were the first to find that low-surface brightness galaxies have lower correlation strength than normal galaxies. This paper still represents one of the best estimate in the literature.

Damped Lyman alpha systems and galaxy formation: Mo & Miralda-Escudè (1994) were the first to find that the total HI mass associated with QSO damped Lyman alpha absorption line systems can put stringent constraints on models of structure formation. In particular, they found that the mixed dark matter (MDM) model does not have enough clustering power on small scale to match the observations. This triggered a series of re-investigations of the original MDM model.