Curriculum Vitae
Roberto G. Abraham

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A. Biographical Information

Date of Birth: April 12, 1965
Nationality: Canadian

Education:

- **1988–1992:** Doctor of Philosophy (Astrophysics), Oxford University. Thesis entitled "Imaging of BL Lac Objects". Supervised by I. M. McHardy and R. L. Davies.
- **1983–1987:** Bachelor of Science (First Class) in the Honours Physics program, University of British Columbia.

Employment:

- **July 2009 – :** Associate Chair, Department of Astronomy and Astrophysics, University of Toronto
- **July 2009 – :** Full Professor, Department of Astronomy and Astrophysics, University of Toronto.
- **July 2003 – June 2009:** Associate Professor (with tenure), Department of Astronomy and Astrophysics, University of Toronto.
- **July 2000 – July 2003:** Assistant Professor (tenure track), Department of Astronomy and Astrophysics, University of Toronto.
- **November 1994 to June 2000:** Research Associate (1994 – 1997) and PPARC Advanced Fellow (1998 – 2000) at the Institute of Astronomy, University of Cambridge. Senior Scientific Officer, Royal Greenwich Observatory, Cambridge, April 1997–April 1998.
- **November 1991 to October 1994:** Research Associate at the Dominion Astrophysical Observatory, Herzberg Institute of Astrophysics, National Research Council of Canada, Victoria, B.C., Canada.

- **Summer 1987:** Research Engineer at the Department of Physics, University of British Columbia, Canada, investigating anomalous dispersion in molecular iodine vapour by laser interferometry.
- **Summer 1986:** Undergraduate Research Assistant at the Department of Physics, UBC, doing research in laser spectroscopy.

Honours and Awards:

- **2005:** Canada Foundation for Innovation Career Award
- **2005:** E. W. R. Steacie Memorial Fellowship
- **2005:** Faculty of Arts & Science Outstanding Teaching Award
- **2002:** Premier's Research Excellence Award.
- **1998:** PPARC Advanced Fellowship.
- **1988–1991:** Overseas Research Student Award, Oxford University.
- **1986:** Bruce Medal (Physics), University of British Columbia.
- **1984–1987:** Province of British Columbia Postsecondary Scholarship.

Recent professional activity:

- Evidence of impact
  - ADS/Web Of Science citations: > 6000, with $h = 41$. As of Feb. 2011 I have produced 23 papers with over 100 citations, 13 of which have been as first or second author.
  - I am presently serving on or chairing all three major advisory bodies for Canadian astronomy: The HIA Advisory Board (Member), the NSERC Evaluation Committee for Astronomy and Space Physics (Chair), and the Joint Committee for Space Astronomy (Chair). I am also Canada's representative on the JWST Advisory Committee (JSTAC), am serving on the CASCA 2010 Long Range Planning committee (which is defining the nation's ten-year plan for astronomical infrastructure development) and am vice-chair of the AURA oversight committee for Gemini (AOC-G). Last year I served (for the second time) as Chair of one of the extragalactic panels on the HST Time Allocation Committee (Cycle 18).
  - My Gemini Deep Deep Survey (GDDS) and its spin-off project (the GLARE survey) have been responsible for four of the twelve 'highest impact' papers produced so far by the Gemini Telescopes. (The criterion for 'highest impact' is that defined by the Gemini Director, namely citation at over $10\times$ the average citation rate for a paper in the Astrophysical Journal.) The GDDS has produced eleven papers so far with over 1100 citations to Dec 2010. The team I led designed, developed and implemented the Nod & Shuffle mode on the Gemini GMOS Spectrograph, which is

arguably the most unique feature of GMOS. I am particularly proud of the fact that while my team proposed and developed Nod & Shuffle for our own purposes, we did it as a common-user mode, so Nod & Shuffle has enabled high-impact programs of investigation by other astronomers in areas totally different from my own.

- I've won major Canadian awards for both my research (a Steacie Memorial Fellowship and a CFI Career Award; combined value $\sim \$600,000$) and for my teaching (the University of Toronto's Faculty of Arts & Science Outstanding Teaching Award).
- I invented the popular Concentration-Asymmetry and Gini Coefficient classification systems used to describe galaxy morphology.
- I am working to build a closer connection between observational work and instrumentation development. To this end, I helped put together the 'vision document' for the University of Toronto's new Dunlap Institute for Astrophysics. I am working closely with the Institute to help it grow, and involving it in my own programs of research. I am presently leading the JWST Tunable Filter Imager Guaranteed Time Observations First Light Science Team. I am also leading a program to investigate the NIR surface brightness at astronomically interesting sites in the Canadian arctic (campaign starting February 2011). In earlier instrumentation work, I led the international team undertaking the design study for the Thirty Metre Telescope's Wide-Field Optical Spectrograph (WFOS), a multi-barrel wide-field optical/near-IR spectrometer. I served on the Readiness Review Committee for the Gemini Multi-Conjugate Adaptive Optics system and was a reviewer at the Conceptual Design Review for the proposed Gemini/Subaru Wide-field Multi-Object Spectrograph (WFMOS). I am currently leading the team which built the FLAMINGOS-2 Tandem Tunable Filter (F2T2) for the Gemini telescope. F2T2 now awaits the (long-delayed) commissioning of FLAMINGOS-2 and will be a user-accessible instrument on the Gemini South telescope in 2012.
- I helped develop (and enjoyed teaching for several years) the largest astronomy class in North America (AST101 and AST201, see below), in which lectures are given to 1300+ students in the University's Convocation Hall.

- Research Grants:
  - 2007 NSERC Equipment Grant. \$33,000. 'A Practical Near-Infrared OH-suppression filter'. (PI R. Abraham; co-I's P. G. Martin, R. Jayawardhana, K. Glazebrook).
  - 2005 Steacie Memorial Fellowship. \$180,000 funding for teaching relief, and \$158,000 in additional funding from NSERC via the Steacie Supplement Program.
  - 2005 Canada Foundation for Innovation Career Award — \$264,000 in research funds being used to construct the Flamingos-2 Tandem Tunable Filter.
  - 2005 – "The Origin and Evolution of Galaxies". NSERC Personal Research Grant. \$517,600 (\$64,700 per year for five years; subsequently extended for three more years to allow me to serve on the NSERC grant selection committee without conflict of interest).
  - "Band-limiting filters for the Magellan IMACS spectrograph". NSERC Equipment Grant. \$15,313. (Co-applicant with H. Yee).

- "The Formation of the Hubble Sequence". NSERC Personal Research Grant. $137,500 ($32,500 for the first year, increased to $35,000 per year for 2001-4).
- Premier's Research Excellence Award (2002). $150,000.
- "The Canada-Franch-Hawaii Legacy Survey". NSERC Collaborative Research Opportunities Program 2001. Co-applicant on a proposal led by by PI Raymond Carlberg. Awarded $470,000 anually for 5 years for a total of $2,350,000.
- "The Toronto Carnegie Magellan Collaboration". Ontario Innovation Trust, Investments in Research Infrastructure Program 2001. Co-applicant on a proposal led by by PI Raymond Carlberg. Awarded $1,321,400

- Teaching and Research Supervision:
  - Ph.D. supervisor for Ivana Damjanov, Richard Chou, Adam Atkinson, Stephanie Keating (Dept. of Astronomy & Astrophysics, University of Toronto). Previous PhD supervision: Preethi Nair (postdoctoral fellow in Bologna), Erin Mentuch (postdoctoral fellow, McMaster). At the University of Cambridge I co-supervised (jointly with Prof. R. S. Ellis) the Ph.D. degrees of Jarle Brinchmann (faculty, Leiden) and F. Menanteau (research scientist, Rutgers). My recent postdoc Damien Le Borgne is now on the faculty at IAP, Paris. At the MSc level, at the University of Toronto I supervised the AST1500/1501 (MSc equivalent) projects of Brian Lee, Jennifer O' Neill, Duy Nguyen, Jean-René Gauthier, Erin Mentuch, Sherry Yeh, Ivana Damjanov, and Juan-Diego Soler
  - University of Toronto, Spring 2004-5 and 2008: Astronomy 201. "Stars and Galaxies" (Undergraduate level course). Enrolment capped at 1300.
  - University of Toronto, Fall 2003-4 and 2007-8: Astronomy 101. "The Sun and its Neighbours" (Undergraduate level course). Enrolment capped at 1300.
  - University of Toronto, Spring 2001–2004, 2009–2010: Astronomy 121, "The Origin and Evolution of the Universe" (Undergraduate level course). Enrolment capped at 200.
  - University of Toronto, Fall 2000–2002, Spring 2009, 2011: Astronomy 2040, "Extragalactic Astronomy" (direct-entry PhD program).
  - Cambridge University, Lent Term 2000: Post-graduate lectures on galaxy evolution.
  - Cambridge University, Michaelmas Term 1998: Post-graduate lectures on observational astronomy (graduate training lectures).
  - Cambridge University, October 1998: Four undergraduate lectures on general relativity (Natural Sciences Tripos, Part II Physics), filling in for R. Carswell.
  - Lecturer, 1997 Physics Summer School, Centre de Physique, Les Houches, France.

- Service:
  - Member, CASCA Long Range Planning Committee (2010–11)
  - Member, James Webb Space Telescope Advisory Committee (2009–Present)

- Member, NSERC GSC-17/Physics Evaluation Group Committee (2008 — present; Chair, 2011)
- Member, Herzberg Institute of Astrophysics Advisory Board (2008 — present)
- Member, CASCA/CSA Joint Committee for Space Astronomy (2008 — present; Chair, 2011)
- AURA Oversight Committee for Gemini (2006 — present; Vice-Chair)
- Member, Instrument Team, James Webb Space Telescope Fine Guidance Sensor Camera (2002 — present).
- Member, James Webb Space Telescope Canadian Steering Committee. (2002 — present).
- Chair, Extragalactic panel, HST Cycle 18 (2010) and Cycle 15 (2006)
- Member, Steering Committee for CFHT Wide-Field Infrared Camera (2001 — 2005).
- Member, JSWT Science Assessment Team (2005)
- Member, Science Advisory Committee, TMT Project (2004 — 2006).
- Service on numerous telescope time allocation committees (e.g. CFHT, Gemini, HST, etc).
- Regular referee for ApJ, AJ, A&A, Nature

- University Service:
  - Associate chair for graduate studies (2009 –)
  - Member, initial steering committee for Dunlap Institute (2008).
  - Tenure review committee for C. Matzner (2008).
  - Chair, University of Toronto Magellan Time Allocation Committee (2001—2007)
  - Colloquium chair, Department of Astronomy & Astrophysics Colloquium Series and G2000 talks (2001-2003; 2008).
  - Member of supervisory or examination committee for the following University of Toronto graduate students: Marcelo Ruetalo (Preliminary Examination Committee). Hy Trac (Supervisory Committee and Preliminary Examination Committee). Joseph Sultana (Department of Physics; Supervisory Committee and Preliminary Examination Committee). Kris Blindert (Supervisory Committee and Preliminary Examination Committee). Heather Cameron (Supervisory Committee). Lihong Yao (Supervisory Committee and Preliminary Examination Committee; Chaired Preliminary Examination). Michael Gladders (Ph.D Examination Committee). Chris Burns (Ph. D Examination Committee). Megan McClure (Supervisory Committee & Ph.D. Examination Committee). Tracy Webb (Ph. D Examination Committee). Pengjie Zhang (Ph.D. examination committee). Tornado Li (Ph.D committee). Preethi Nair (Ph. D supervisor). Jennifer ONeill (Ph. D. supervisor before her medical leave). Paula Ehlers (Ph. D comittee). Marco Viero (Ph. D committee). Marija Stankovic (Ph. D committee) Fernando Pena (Ph.D committee). Erin Mentuch (Ph.D supervisor). Ivana Damjanov (Ph.D supervisor). Richard Chou (Ph.D. supervisor).

  - Search Committee (2001/2) for new faculty appointments in the Dept. of Astronomy & Astrophysics (appointed van Kerkwijk, Wu, & Matzner).
  - Search Committee (2003/4) for new faculty appointments in the Dept. of Astronomy & Astrophysics (appointed D-S. Moon).

- Public Outreach: I enjoy helping the general public grow in their appreciation of Astronomy, and give 5–10 public outreach talks each year. I am presently the Honorary President of the Toronto Centre of the Royal Astronomical Society of Canada (RASC), and last year was a keynote speaker at Starfest (the largest 'Star Party' in North America), and in the previous year was the keynote speaker at the General Assembly of the RASC. As a consequence of publicity generated by my research work, I regularly give television, newspaper and magazine interviews and have had my research described in the national and international press. In 2009 I was a CASCA 'Galileo Lecturer' and was pleased to give many outreach talks in support of the International Year of Astronomy.

B. Scholarly and Professional Work

(Papers that I consider 'career highlights' are marked with a $\star$).

Refereed Articles

79. Damjanov, I., Abraham, R. G. et al. 2011, arXiv, arXiv:1101.0818, "Extragalactic Fields Optimized for Adaptive Optics" (PASP, in press)
78. Chou, R. C. Y., Bridge, C. R., & Abraham, R. G. 2010, arXiv, arXiv:1012.1590 "The Space Density Evolution of Wet and Dry Mergers in the Canada-France-Hawaii Telescope Legacy Survey" (ApJ, in press)
77. Mentuch, E., Abraham, R. G., & Zibetti, S. 2010, ApJ, 725, 1971 "A Simple Connection Between the Near- and Mid-infrared Emission of Galaxies and Their Star Formation Rates '
76. Green, A. W., et al. 2010, Nature, 467, 684, "High star formation rates as the origin of turbulence in early and modern disk galaxies"
75. Nair, P. B., van den Bergh, S., & Abraham, R. G. 2010, ApJ, 715, 606, "The Environmental Dependence of the Luminosity-Size Relation for Galaxies"
74. Nair, P. B., & Abraham, R. G. 2010, ApJ, 714, L260, "On the Fraction of Barred Spiral Galaxies"
73. $\star$ Nair, P. B., & Abraham, R. G. 2010, ApJS, 186, 427, "A Catalog of Detailed Visual Morphological Classifications for 14,034 Galaxies in the Sloan Digital Sky Survey"
72. $\star$ Mentuch, E., Abraham, R. et al. 2009, ApJ, 706, 1020, "A Near-Infrared Excess in the Continuum of High-redshift Galaxies: A Tracer of Star Formation and Circumstellar Disks?"
71. Tasca, L. A. M., et al. 2009, A&A, 503, 379, "The zCOSMOS redshift survey: the role of environment and stellar mass in shaping the rise of the morphology-density relation from z ˜ 1"
70. $\star$ Damjanov, I., et al. 2009, ApJ, 695, 101, "Red Nuggets at $z \sim 1.5$: Compact Passive Galaxies and the Formation of the Kormendy Relation"
69. Sheth, K., et al. 2008, ApJ, 675, 1141, "Evolution of the Bar Fraction in COSMOS: Quantifying the Assembly of the Hubble Sequence" [RGA is 5th author]
68. Casey, C. M., et al. 2008, ApJS, 177, 131, Optical Selection of Faint Active Galactic Nuclei in the COSMOS Field [RGA is 5th author]
67. $\star$ Abraham, R. G., et al. 2007, ApJ, 669, 184, "The Gemini Deep Deep Survey. VIII. When Did Early-Type Galaxies Form?"
66. Capak, P., Abraham, R. G., Ellis, R. S., Mobasher, B., Scoville, N., Sheth, K., & Koekemoer, A. 2007, ApJS, 172, 284, "The Effects of Environment on Morphological Evolution at $0 < z < 1.2$ in the COSMOS Survey"
65. Scoville, N., et al. 2007, ApJS, 172, 38, "COSMOS: Hubble Space Telescope Observations" [RGA is 2nd author]
64. McCarthy, P. J., et al. 2007, ApJ, 664, L17, "A Compact Cluster of Massive Red Galaxies at a Redshift of 1.5" (GDDS Paper IX; RGA is 3rd author]
63. Stanway, E. R., et al. 2007, MNRAS, 376, 727, "The GLARE Survey - II. Faint z ˜ 6 Lyα line emitters in the HUDF" [RGA is 4th author]

62. Le Borgne, D., et al. 2006, ApJ, 642, 48, "Gemini Deep Deep Survey. VI. Massive Hδ-strong Galaxies at z ˜= 1" [RGA is 2nd author]

61. Phillips, M. M., et al. 2006, AJ, 131, 2615, "Optical and Near-Infrared Observations of the Peculiar Type ia Supernova 1999ac" [RGA is 4th author]

60. Savaglio, S., et al. 2005, ApJ, 635, 260, "The Gemini Deep Deep Survey. VII. The Redshift Evolution of the Mass-Metallicity Relation" [RGA is 5th author]

59. ⋆ Juneau, S., et al. 2005, ApJ, 619, L135, "Cosmic Star Formation History and Its Dependence on Galaxy Stellar Mass " [RGA is 7th author]

58. Smith et al. 2004 ,'Halpha kinematics of a $z \sim 1$ disc galaxy from near-infrared integral field spectroscopy", MNRAS, 354L, 19. [RGA is fourth author]

57. ⋆ Glazebrook et al. 2004 (GDDS paper III), "The Evolution of Galaxy Stellar Masses from the Gemini Deep Deep Survey", Nature, 430, 181. [RGA is second author]

56. ⋆ Abraham, R. G., et al. (GDDS Paper I) 2004, AJ, 127, 2455. "The Gemini Deep Deep Survey. I. Introduction to the Survey, Catalogs, and Composite Spectra"

55. Stanway, E. R., et al. 2004, ApJLett, 604, L13. "Three Lyα Emitters at z ˜ 6: Early GMOS/Gemini Data from the GLARE Project".

54. Savaglio, S., et al. (GDDS Paper II) 2004, ApJ, 602, 51. "The Gemini Deep Deep Survey. II. Metals in Star-forming Galaxies at Redshift $1.3 < z < 2$"

53. Chen, H., R. O. Marzke, P. J. McCarthy, P. Martini, R. G. Carlberg, S. E. Persson, A. Bunker, C. R. Bridge, and R. G. Abraham. 2003. The Astrophysical Journal, 586, 745-764. *.The Las Campanas Infrared Survey. IV. The Photometric Redshift Survey and the Rest-Frame R-Band Galaxy Luminosity Function at* $0.5 < z < 1.5$*."*

52. ⋆ Abraham, R. G., S. van den Bergh, and P. Nair. 2003. The Astrophysical Journal, 588, 218-229. *"A New Approach to Galaxy Morphology. I. Analysis of the Sloan Digital Sky Survey Early Data Release."*

51. Whyte, L. F., Abraham, R. G., Merrifield, M.R., Eskridge, P. B., & Frogel, J. A. 2002. Monthly Notices of the Royal Astronomical Society, 336, 1281-1286. *"Morphological Classification of the OSU Bright Spiral Galaxy Survey".*

50. van den Bergh S., Abraham R. G., Whyte L. F., Merrifield M. R., Eskridge P. B., Frogel J. A., & Pogge R., 2002, The Astronomical Journal, 123, 2913-2924. *"The Visibility of Galactic Bars and Spiral Structure at High Redshifts".*

49. Firth A. E., Somerville R. S., McMahon R. G., Lahav, O., Ellis, R. S., Sabbey, C. N., McCarthy, P. J., Chen, H.-W., Marzke, R. O., Wilson, J., Abraham, R. G., Becket, M. G., Carlberg, R. G., Lewis, J. R., Mackay, C. D., Murphy, D. C., Oemler, A. E., Persson, S. E.., 2002, Monthly Notices of the Royal Astronomical Society, 332, 617-646. *"The Las Campanas Infrared Survey - II. Photometric redshifts, comparison with models and clustering evolution".*

48. Chen H., McCarthy P. J., Marzke R. O., Wilson,J., Carlberg,R.G., Firth,A.E., Persson,S.E., Sabbey,C.N., Lewis,J.R., McMahon,R.G., Lahav,O., Ellis,R.S., Martini,P., Abraham,R.G., Oemler,A., Murphy,D.C., Somerville,R.S., Beckett,M.G., Mackay,C.D., 2002, The Astrophysical Journal, 570, 54-74. *"The Las Campanas Infrared Survey. III. The H-Band Imaging Survey and the Near-Infrared and Optical Photometric Catalogs"*

47. McCarthy P. J., Carlberg R. G., Marzke,R., Chen,H.-W., Firth,A., McMahon,R., Wilson,J., Persson,E., Ellis,R., Abraham,R.G., Lahav,O., Oemler,A., Sabbey,C., Somerville,R.,

2001, The Astrophysical Journal (Letters), 560, L131-134. *"Clustering of Very Red Galaxies in the Las Campanas IR Survey"*

46. Abraham R. G., & van den Bergh S., 2001, Science, 293, 1273-1278. *"The Morphological Evolution of Galaxies"*.

45. Block D. L., Puerari I., Takamiya M., Abraham R., Stockton A., Robson I., Holland W., 2001, Astronomy & Astrophysics, 371, 393-403. *"Dust-penetrated morphology in the high-redshift universe: Clues from NGC 922"*.

44. Ellis, R. S., Abraham, R. G., & Dickinson, M. E. (2001). ApJ, 551, 111-130. *"The Relative Star Formation Histories of Spiral Bulges and Elliptical Galaxies in the Hubble Deep Fields"*

43. Menanteau, F., Abraham, R. G., & Ellis, R. S. (2001). MNRAS, 322, 1-12. *"Evidence for Evolving Spheroids in the Hubble Deep Fields North and South"*

42. Abraham, R. G. & Merrifield, M. R. (2000), AJ, 120, 2835-2842. *"Explorations in Hubble Space: A quantitative tuning fork"*

41. Ellis, R. S., Abraham, R. G., Brinchmann, J., & Menanteau, F. (2000), Astronomy and Geophysics, 41, 10-16. *"Galaxy evolution in full color"*

40. Le Fevre, O., Abraham, R., Schade, D., Tresse, L., Ellis, R., Lilly, S., Glazebrook, K., Hammer, F., Colless, M., & Crampton, D. (2000), MNRAS, 311, 565-575). *"Hubble Space Telescope Imaging of the CFRS and LDSS Redshift Surveys IV: The Merger History of Field Galaxies to $z \sim 1$"*

39. Abraham, R. G. (1999), Ap&SS, 269, 323-338. *"Quantifying Morphological Evolution from Low to High Redshifts"*

38. Wilman, R. J., Crawford, C. S., & Abraham, R. G. (1999). MNRAS, 309, 299-324. *"Mapping the gas kinematics and ionization structure of four ultraluminous IRAS galaxies"*

37. Schade, D., Lilly, S. J., Crampton, D., Ellis, R. S., Le Fèvre, O., Hammer, F., Brinchmann, J., Abraham, R. G., Colless, M., Glazebrook, K., Tresse, L., & Broadhurst, T. (1999). Ap J, 525, 31-46. "Hubble Space Telescope Imaging of the CFRS and LDSS Redshift Surveys— III. Field elliptical galaxies at $0.2 < z < 1.0$"

36. Menanteau, F., Ellis, R. S., Abraham, R. G., Barger, A., & Cowie, L. L. (1999), MNRAS, 309, 208-220. *"Optical-Infrared Colour Distribution of a Statistically-Complete Sample of Faint Field Spheroidal Galaxies"*

35. ⋆ Abraham, R. G., Merrifield, M. R., Ellis, R. S., Tanvir, N. R., & Brinchmann, J. (1999). MNRAS, 308, 569-576. *"The Evolution of Barred Spiral Galaxies in the Hubble Deep Fields North and South"*

34. ⋆ Abraham, R. G., Ellis, R. S., Fabian, N. R., Tanvir, N. R., & Glazebrook, K. (1999). MNRAS, 303, 641-658. *"The Star Formation History of the Hubble Sequence: Spatially Resolved Colour Distributions of Intermediate Redshift Galaxies in the Hubble Deep Field"*

33. Morris, S. L., Hutchings, J. B. H., Carlberg, R. G., Yee, H. K. C., Ellingson, E., Balogh, M., Abraham, R. G., & Smecker-Hane, T. (1998). The Astrophysical Journal, 507, 84-101. *"Galaxy Evolution in the z=0.4274 cluster MS1621.5+2640"*

32. Ellingson, E., Yee, H. K. C., Morris, S. L., Abraham, R. G., & Carlberg, R. G., (1998). *Ap. J. Supp.* , 116, 247 *"The CNOC Cluster Redshift Survey Catalogs. VI. MS 0015.9+1609 and MS 0451.5-0305"*

31. Abraham, R. G., Yee, H. K. C., Ellingson, E., Carlberg, R. G., & Morris, S. L. (1998). *Ap. J. Supp.* , 116, 231 *"The CNOC Cluster Redshift Survey Catalogs V. MS 1224.7+2007 and MS 1512.4+3647"*

30. Yee, H. K. C., Ellingson, E., Morris, S., Abraham, R. G., Carlberg, R. G., (1998). Ap.J (Supp), 116, 211 *"The CNOC Cluster Redshift Survey Catalogs. IV. MS 1358.4+624 and MS 1008.1-1224"*

29. Lilly, S., Schade, D., Ellis, R., Le Fevre, O., Brinchmann, J., Abraham, R., Tresse, L., Hammer, F., Crampton, D., Colless, M., Glazebrook, K., Mallen-Ornelas, G., & Broadhurst, T. (1998), The Astrophysical Journal, 500, 75, *"Hubble Space Telescope Imaging of the CFRS and LDSS Redshift Surveys II: Structural Parameters and the Evolution of Disk galaxies to $z \sim 1$"*

28. $\star$ Brinchmann, J., Abraham, R., Schade, D., Tresse, L., Ellis, R., Lilly, S., Le Fevre, O., Glazebrook, K., Hammer, F., Colless, M., & Crampton, D. (1998) The Astrophysical Journal, 499, 112 *"Hubble Space Telescope Imaging of the CFRS and LDSS Redshift Surveys I: Morphological Properties"*

27. Glazebrook, K., Abraham, R., Santiago, B., Ellis, R., & Griffiths, R. (1998), MNRAS, 297, 885-904 *"The Physical Parameters of the Evolving Population of Faint Galaxies"*

26. Wright, S. C., McHardy, I. M., Abraham, R. G., & Crawford, C.S. (1998) MNRAS, 296, 961-976 *"Near Infrared Imaging of the Host Galaxies of BL Lacertae Objects"*

25. McHardy, I. M., Jones, L. R., Merrifield, M. R., Mason, K. R., Newsam, A. M., Abraham, R. G., Dalton, G. B., Carrera, F., Smith, P. J., Rowan-Robinson, M., Wegner, G. A., Lehto, H. J., Branduardi-Raymont, G., Luppino, G. A., Efstathiou, G., Ponman, T. J., Allan, D. J., & Quenby, J. J. (1998). MNRAS 295, 641 *"The Origin of the Cosmic Soft X-ray Background: Optical Identification of an Extremely Deep Rosat Survey"*

24. Wright, S. C., McHardy, I. M., Abraham, R. G. (1998). MNRAS, 295, 799-812. *"Host Galaxies of the OVV Quasars PKS0736+017, OJ 287, and LB2136".*

23. Carlberg, R. G., Yee, H. K. C., Ellingson, E., Morris, S. L., Abraham, R., Gravel, P., Pritchet, C. J., Smecker-Hane, T., Hartwick, F. D. A., Hesser, J. E., Hutchings, J. B., & Oke, J. B. (1997), The Astrophysical Journal (Letters), 485, L13 *"The Average Mass Profile of Galaxy Clusters"*

22. Ellingson, E., Yee, H. K. C., Abraham, R. G., Gravel, P., Carlberg, R. G., Smecker-Hane, T. A., (1997). *Ap. J. Supp.* , 113, 1 *"The CNOC Cluster Redshift Survey Catalogs. III. MS 1621+2640 and MS 0302+1658"*

21. Jones, L. R., McHardy, I. M., Merrifield, M. R., Mason, K. O., Smith, P. J., Abraham, R. G., Branduardi-Raymont, G., Newsam, A. M., Dalton, G., Rowan-Robinson, M., & Luppino, G. (1997). MNRAS, 285, 547 *"X-ray QSO Evolution From a Very Deep ROSAT Survey"*

20. Carlberg, R. G., Yee, H. K. C., Ellingson, S., Morris, S., Abraham, R., Gravel, P., Hartwick, F. D. A., Hesser, J. A., Hutchings, J. B., Oke, J. B., Pritchet, C. J., Smecker-Hane, T. (1997). The Astrophysical Journal, 476L, 7. *"The Dynamical Equilibrium of Galaxy Clusters"*

19. Gladders, M. D., Abraham, R. G., McHardy, I. M., Crawford, C. S., Merrifield, M. R., & Jones, L. R. (1997). MNRAS, 284, 27. *"The Optical Structure and Local Environment of BL Lac Object 1E 1415.6+2557"*

18. van den Bergh, S., Abraham, R. G., Ellis, R. S., Tanvir, N. R., Santiago, B. X. (1996). The Astronomical Journal, 112, 359. *"A Morphological Catalog of Galaxies in the Hubble Deep Field"*

17. Abraham, R. G., van den Bergh, S., Glazebrook, K., Ellis, R. S., Santiago, B. X., Surma, P., & Griffiths, R. (1996c). *Ap. J. Supp.* , 107, 1. *"The Morphologies of Faint Galaxies: II. Classifications from the HST Medium Deep Survey"*

16. Carlberg, R. G., Yee, H. K. C., Ellingson, E., Abraham, R., Gravel, P., Morris, S., & Pritchet, C. (1996). The Astrophysical Journal, 462, 32. *"Galaxy Cluster Virial Masses and Ω"*

15. $\star$ Abraham, R. G., Smecker-Hane, T. A., Hutchings, J. B. H., Carlberg, R. G., Yee, H. K. C., Ellingson, E., Rigler, M. A., Morris. S., & Oke, J. B. (1996b). The Astrophysical Journal, 471, 694. *"Galaxy Evolution in Abell 2390"*

14. $\star$ Abraham, R. G., Tanvir, N. R., Santiago, B. X., Ellis, R. S., Glazebrook, K., van den Bergh, S. (1996a). MNRAS, 279, L47. *"Galaxy morphology to $I = 25$ mag in the Hubble Deep Field"*

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