

Gerald Cecil

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Education

1987 University of Hawaii, Ph.D. in Astronomy, Dissertation: *Kinematics of Spatially Extended High-Velocity Outflow from the Nucleus of M51*

McGill University, M.S. in Theoretical Nuclear Physics, Thesis: *A Statistical Approach to Charge Multiplicity in Relativistic Heavy-Ion Collisions*

McGill University, B.S. in Physics

Professional Positions

2000 - present Professor, 1995 - 2000 Associate Professor, 1989 - 1995 Assistant Professor, Dept. Physics & Astronomy, U. North Carolina at Chapel Hill

1997 - 2000 Project Scientist, International SOAR Telescope Project, National Optical Astronomy Observatories, Tucson

1987 - 1989 Research Fellow, Institute for Advanced Study, Princeton

Research Interest

- Multifrequency studies of internal dynamics and ISM of galaxies that bear on their formation and evolution
- 3D spectrometers for galaxy surveys

Service

- HST, Chandra, Herschel, and GALEX science telescope time-allocation review panels. SFI-Ireland, UK, Canada, Brazil, & Chile instrument program reviewer, National Radio Astronomy Observatory (NRAO) reviewer; NASA TPF-C instrument development selection, SOAR instrument reviews; NASA post-doctoral fellowships reviewer
- Review ApJ, AJ, MNRAS, PASJ, and A&A manuscripts regularly
- Associated Universities in Research for Astronomy (AURA) representative
- Southern African Large Telescope (SALT) Board

Refereed Publications (including review articles)

1. Bloom, J. V. (+ 25 co-authors) 2016 "The SAMI Galaxy Survey: Asymmetry in Gas Kinematics and its Links to Stellar Mass and Star Formation", MNRAS, **submitted**, 9 pages est.

2. Tanner, R., Cecil, G., and Heitsch, F. 2016 “Galactic Winds Radiating to 10 K: Gas Properties at Different Mass Loadings and Mechanical Luminosities”, *ApJ*, **in press**, 15 pages.
3. McCormick, A. (+10 co-authors) 2016 “Exploring the Dust Content of Galactic Winds with Herschel. II. Nearby Dwarf Galaxies”, *ApJ*, **submitted**, 27 pages est.
4. Cecil, G. (+21 co-authors) 2016 “The SAMI Galaxy Survey: Gas Streaming and Dynamical M/L in Rotationally Supported Systems”, *MNRAS*, 456, 1299-1320.
5. Richards, S. N. (+ 23 co-authors) 2016 “The SAMI Galaxy Survey: Can we Trust Aperture Corrections to Predict Star Formation?”, *MNRAS*, 455, 2826-2836.
6. Fogarty, L. M. R. (+24 co-authors) 2015, “The SAMI Pilot Survey: Stellar Kinematics of Galaxies in Abell 85, 168 and 2399”, *MNRAS*, 454, 2050-2066
7. Meléndez, M. (+10 co-authors) 2015 “Exploring the Dust Content of Galactic Winds with Herschel. I. NGC 4631”, *ApJ*, 804, 46-63
8. Bryant, J. (+57 co-authors) 2015 “The SAMI Galaxy Survey: Instrument Specification and Target Selection”, *MNRAS*, 447, 2857-2879
9. Allen, J. T. (+47 co-authors) 2015 “The SAMI Galaxy Survey: Early Data Release”, *MNRAS*, 446, 1567-1583
10. Sharp, R. (+48 co-authors) 2015 “The SAMI Galaxy Survey: Cubism and Covariance, Putting Square Pegs Into Round Holes”, *MNRAS*, 446, 1551-1566
11. Fogarty, L. M. R. (+29 co-authors) 2012 “First Science with SAMI: A Serendipitously Discovered Galactic Wind in ESO 185-G031”, *ApJ*, 761, 169-181
12. Miner, J., Rose, J. A., & Cecil, G. 2011 “Galaxies M32 and NGC 5102 Confirm a Near-IR Spectroscopic Chronometer”, *ApJ Letters*, 727, L15-19
13. Bland-Hawthorn, J. (+11 co-authors) 2011 “Hexabundles: Imaging Fibre Arrays for Low-light Astronomical Applications”, *Optics Express*, 19, 2649-2660
14. Zhang, H., Morgan, D., Cecil, G., Burkholder, A., Ramocki, N. Scull, B. & Lund, P. K. 2008 “Biochromoendoscopy: Molecular Imaging with Capsule Endoscopy for Detection of Adenomas of the GI Tract”, *Gastrointestinal Endoscopy*, 68, 520-527 (identified keynote article)
15. Bland-Hawthorn, J., Veilleux, S., & Cecil, G. 2007 “Galactic Winds: a Short Review”, *Astrophys. Space Sci.*, 311, 87-98
16. Cecil, G. & Rashkeev, D. 2007 “A Side of Mercury Not Seen by Mariner 10”, *Astron. J.*, 134, 1468-1474
17. Cecil, G. & Rose, J. A. 2007 “Insights on Galaxy Structure and Evolution from the Light of Nearby Systems”, *Rep. Prog. Phys.* 70, 1177-1258
18. Ganguly, R. (+5 co-authors) 2007 “Hubble Space Telescope Ultraviolet Spectroscopy of 14 Low-Redshift Quasars”, *Astron. J.*, 133, 479-486
19. Pimentel, D., Patzek, T., & Cecil, G. 2006 “Ethanol Production: Energy, Economic, and Environmental Losses”, *Reviews of Environmental Contamination and Toxicology*, 189, 25-41
20. Veilleux, S., Cecil, G., & Bland-Hawthorn, J. 2005 “Galactic Winds.”, *Annual Review of Astronomy & Astrophysics*, 43, 769-826

21. Groves, B., Cecil, G., Ferruit, P., & Dopita, M. A. 2004 “Spatially Resolved Ultraviolet Spectra of the High-Velocity Nuclear Outflow of NGC 1068.”, *Astrophys. J.*, 611, 786-794
22. Veilleux, S., Shopbell, P. L., Rupke, D. S., Bland-Hawthorn, J., & Cecil, G. 2003 “A Search for Very Extended Ionized Gas in Nearby Starburst and Active Galaxies.”, *Astron. J.*, 126, 2185-2208
23. Cecil, G., Bland-Hawthorn, J., & Veilleux, S. 2002 “Tightly Correlated X-ray/H α Emission from the Superbubble and Superwind in NGC 3079.”, *Astrophys. J.*, 576, 745-752
24. Dopita, M. A., Groves, B., Sutherland, R. S., Binette, L., & Cecil, G. 2002 “Are the Narrow Line Regions in Active Galaxies Dusty and Radiation Pressure Dominated?”, *Astrophys. J.*, 572, 753-761
25. Cecil, G., Dopita, M. A., Groves, B., Wilson, A. S., Ferruit, P., Pécontal, E., & Binette, L. 2002 “Spatial Resolution of High-Velocity Filaments in the Narrow-Line Region of NGC 1068: Associated Absorbers Caught in Emission?”, *Astrophys. J.*, 568, 627-638
26. Wilson, A. S., Yang, Y., & Cecil, G. 2001 “Chandra Observations and the Nature of the Anomalous Arms in NGC 4258 (M 106).”, *Astrophys. J.*, 560, 689-697
27. Cecil, G., Bland-Hawthorn, J., Veilleux, S., & Filippenko, A.V. 2001 “Jet & Wind-Driven Outflows in the Superbubble and Star-Forming Disk of NGC 3079.”, *Astrophys. J.*, 555, 338-355
28. Cecil, G., Greenhill, L.J., De Pree, C.G., Nagar, N., Dopita, M.A., Wilson, A.S., Pérez-Fournon, I., Argon, A.L., & Moran, J. M. 2000 “The Active Jet in NGC 4258 and Its Associated Shocks.”, *Astrophys. J.*, 536, 675-696
29. Veilleux, S., Bland-Hawthorn, J., & Cecil, G. 1999 “A Kinematic Link Between Boxy Bulges, Stellar Bars, and Nuclear Activity in NGC 3079 and NGC 4258”, *Astron. J.*, 118, 2108-2122
30. Veilleux, S., Bland-Hawthorn, J., Cecil, G. et al 1999 “Galactic-Scale Outflow and Supersonic Ram-Pressure Stripping in the Virgo Cluster Galaxy NGC 4388”, *Astrophys. J.*, 520, 111-123
31. Bland-Hawthorn, J., Veilleux, S., Cecil, G., et al 1998 “The Smith Cloud: HI Associated with the SGR Dwarf?” *MNRAS*, 299, 611-624
32. Morse, J. A., Cecil, G., Wilson, A. S. et al 1998 “Inclined Gas Disks in the Lenticular Galaxy NGC 5252”, *Astrophys. J.*, 505, 150-173
33. Bland-Hawthorn, J., Lumsden, S.L., Voit, G.M., Cecil, G., & Weisheit, J.C. 1997 “Strict Limits on the Ionizing Luminosity in NGC 1068 from Jet-Axis Molecular Clouds”, *Astrophys. Space Sci.*, 248, 177-190
34. Dehnen, W., Bland-Hawthorn, J., Quirrenhach, A., & Cecil, G. 1997 “Kinematics and Mass Modelling of NGC 1068”, *Astrophys. Space Sci.*, 248, 33-42
35. Bland-Hawthorn, J., Gallimore, J., et al 1997 “The Ringberg Standards for NGC 1068”, *Astrophys. Space Sci.*, 248, 9-19
36. Tsvetanov, Z., Morse, J.A., Wilson, A.S., & Cecil, G. 1996 “Complex Gaseous Structure in the Nucleus of NGC 5252”, *Astrophys. J.* 458, 172-180
37. Statler, T.S., Smecker-Hane, T., & Cecil, G. 1996 “The Post-Merger Elliptical NGC 1700: Stellar Kinematic Fields to Four Effective Radii”, *Astron. J.*, 111, 1512-1520
38. Cecil, G., Morse, J.A., & Veilleux, S. 1995 “Spectral Evidence for Shock-Ionized Gas Along the Jets of NGC 4258”, *Astrophys. J.*, 452, 613-9

39. Veilleux, S., Cecil, G., & Bland-Hawthorn, J. 1995 “The Interstellar Disk-Halo Connection in the Spiral Galaxy NGC 3079”, *Astrophys. J.*, 445, 152-160
40. Cecil, G., Wilson, A.S., & DePree, C. 1995 “Hot Shocked Gas Along the Jets of NGC 4258 (M106)”, *Astrophys. J.*, 440, 181-190
41. Veilleux, S., Cecil, G., Bland-Hawthorn, J. et al 1994 “The Nuclear Superbubble of NGC 3079”, *Astrophys. J.*, 433, 48-64
42. Hartigan, P., Heathcote, S., Raymond, J.C., Morse, J., & Cecil, G. 1994 “Spectrophotometric Evidence for Velocity Variability in the HH-34 and HH-111 Stellar Jets”, *Astron. J.*, 106, 1139-1155
43. Hartigan, P., Morse, J.A., Heathcote, S., & Cecil, G. 1993 “Observations of Entrainment and Time Variability in the HH-47 Jet”, *Astrophys. J.*, 414, L121-124
44. Morse, J.A., Heathcote, S., Cecil, G., et al 1993 “The Bow Shock and Mach Disk of HH-111V”, *Astrophys. J.*, 410, 764-776
45. Morse, J.A., Hartigan, P., Cecil, G., et al 1992 “The Bow Shock and Mach Disk of HH 34”, *Astrophys. J.*, 399, 231-239
46. Cecil, G., Wilson, A.S., & Tully, R.B. 1992 “The Braided Jets in the Spiral Galaxy NGC 4258”, *Astrophys. J.*, 390, 365-377
47. Cecil, G. 1991 “Kinematics of the Helical Nuclear Jets in NGC 4258”, *PASP*, 103, 894-897
48. Sokolowski, J., Bland-Hawthorn, J., & Cecil, G. 1991 “Imaging Spectrophotometry of Ionized Gas in NGC 1068: 3. Anisotropic Excitation of the Large-Scale Disk by Scattering of Nuclear Continuum”, *Astrophys. J.*, 375, 583-593
49. Bland-Hawthorn, J., Sokolowski, J., & Cecil, G. 1991 “Imaging Spectrophotometry of Ionized-Gas in NGC 1068: 2. Global Ionization of the Inner Disk”, *Astrophys. J.*, 375, 78-86
50. Cecil, G., Bland, J., & Tully, R.B. 1990 “Imaging Spectrophotometry of Ionized-Gas in NGC 1068: 1. Kinematics of the Narrow-Line Region”, *Astrophys. J.*, 355, 70-91
51. Cecil, G. 1988 “Kinematics of Spatially extended High-Velocity Outflow from the Nucleus of M51”, *Astrophys. J.*, 329, 38-58
52. Henry, J.P., Heyer, I., Cecil, G., et al 1987 “Synoptic Seeing Measurements at the University of Hawaii 2.2m Telescope”, *PASAP*, 99, 1354-1359
53. Cecil, G. & Stockton, A. 1985 “The Nature of the Luminous Feature Between Markarian 205 and NGC 4319”, *Astrophys. J.*, 288, 201-204
54. Cecil, G., & Rose, J.A. 1984 “Spatially Resolved High-Velocity Outflow from the Nucleus of M51”, *Astrophys. J.*, 287, 131-137
55. Rose, J.A. & Cecil, G. 1983 “Optical Spectrophotometry of the Nuclear Region of M51: 2. Further Evidence for Nuclear Activity”, *Astrophys. J.*, 266, 531-542
56. Cecil, G. & Thompson, L.A. 1983 “Tidal Truncation of the Globular Cluster NGC 5927”, *PASP*, 95, 587
57. Cecil, G., Das Gupta, S., & Myers, W.D. 1980 “Geometrical Aspects of Relativistic Nuclear Collisions”, *Phys. Rev. C*, 22, 2018-2023
58. Cecil, G., Das Gupta, S., & Mekjian, A. 1979 “Charge Multiplicity in Relativistic Heavy-Ion Collisions - Statistical Model Approach”, *Phys. Rev. C*, 20, 1021-1027

Published Conference Proceedings (invited reviews, unrefereed, no abstracts)

1. Lawrence, J. S., et al 2014 “Towards a Spectroscopic Survey of 100,000 Spatially Resolved Galaxies with Hector”, in *Ground-based and Airborne Instrumentation for Astronomy V*. Edited by Ramsay, Suzanne K., McLean, Ian S., & Takami, Hideki. Proceedings of the SPIE Volume 9147, 2-10
2. Bland-Hawthorn, J., Bryant, J., Robertson, G., Gillingham, P., O’Byrne, J. Cecil, G. et al 2011 “Hexabundles: imaging fibre arrays for low-light astronomical applications”, in *Ground-based and Airborne Instrumentation for Astronomy III*. Edited by McLean, Ian S.; Ramsay, Suzanne K.; Takami, Hideki. Proceedings of the SPIE, Volume 7735, 773541-773541-12
3. Cecil, G. 2007 “AGN Shocks in 3D”, in *Science Perspectives for 3D Spectroscopy*. Edited by M. Kissler-Patig, M.M. Roth and J.R. Walsh, Springer-Verlag, 241-251
4. Cecil, G. 2006 “Programs for Laser-AO Assisted Integral-Field Spectrometers on Ionized Flows”, *New Astron. Rev.*, 49, 553-568
5. Ferruit, P., Bradley, L. D., Kaiser, M. E., Cecil, G., Mundell, C. G., Jungwiert, B., Emsellem, E., Wilson, A. S., Terashima, Y., and Binette, L. 2004 “The Central Regions of M51 Observed with HST/STIS.” IAU Symposium No. 222: *The Interplay among Black Holes, Stars, and ISM in Galactic Nuclei*. eds. Storchi Bergmann, L. C. Ho, and H. R. Schmitt (2004).
6. Cecil, G. & Crain, J. A. 2004 “SOAR Remote Observing: Tactics & Early Results.”, in *Optimizing Scientific Return for Astronomy through Information Technologies*, Proceedings of the SPIE, 5493, 73-80
7. Cecil, G., Ferruit, P., & Groves, B. 2003 “UV Spectra of NGC 1068: Photo Ionized/Accelerated NLR.”, in *Active Galactic Nuclei: from Central Engine to Host Galaxy*, ASP Conference Series, Vol. 290. Edited by Collin, S., Combes, F., & Shlosman, I., 185-186
8. Cecil, G., Crain, J. A., & Schumacher, G. 2002 “Remote Use of the 4.25m SOAR Telescope with LabVIEW.”, in *Advanced Global Communications Technologies for Astronomy II*. Proceedings of the SPIE, Volume 4845, 72-79.
9. Cecil, G. 2001 “Resolving the NLR in NGC 1068 with STIS: Associated Absorbers Seen in Emission?”, ASP Conference Series, Vol. 255 *Mass Outflow in Active Galactic Nuclei: New Perspectives*. Edited by D. M. Crenshaw, S. B. Kraemer & I. M. George, 227-232
10. Cecil, G., Ferruit, P. & Veilleux, S. 2001 “Bubbles, Bow-Shocks, and Bullets over Broad-Lines: 3 Ionized Outflows Resolved with HST.”, *RevMex AA Conference Series*, eds. A. Raga & L. Binette, 13, 170-176
11. Veilleux, S., Cecil, G., Bland-Hawthorn, J., & Shopbell, P. L. 2001 “New Results from a Survey of Galactic Outflows in Nearby Active Galactic Nuclei.”, *RevMex AA Conference Series*, eds. A. Raga & L. Binette, 13, 222-229
12. Cecil, G. 2000 “First Generation Instruments for the SOAR 4.25m Telescope.” SPIE, 4008, 11 pages
13. Cecil, G. 2000 “Ionized Outflows in 3D: Insights from Herbig-Haro Objects & Applications to Nearby AGN.”, ASP Conference # 195 *Imaging the Universe in 3D: Astrophysics with Advanced Multi-Wavelength Imaging Devices*, eds. J. Bland-Hawthorn & W. van Breugel, 263-276
14. Sebring, T.A., Cecil, G., & Moretto, G. 1998 “SOAR Telescope Project: a 4m Telescope Focused on Image Quality.” SPIE, 3352, 62-69

15. Cecil, G. 1994 "Hot Shocked Gas Along the Helical Jets of NGC 4258." In Proceedings of IAU Colloquium No. 149 — *Tridimensional Optical Spectroscopic Methods in Astrophysics*, Marseille France, 118-122
16. Veilleux, S. & Cecil, G. 1994 "HIFI Survey of Emission-Line Galaxies: Recent Results on the Nuclear Superbubble of NGC 3079." In Proceedings of IAU Colloquium No. 149 — *Tridimensional Optical Spectroscopic Methods in Astrophysics*, Marseille France, 113-117
17. Cecil, G., De Pree, C., & Wilson, A. S. 1994 "Hot Entrained Gas in the Jet of NGC 4258 (M 106)." In AIP Conference Proceedings 313 *The Soft X-Ray Cosmos*, E.M. Schlegel & R. Petre (eds.), AIP Press, New York, 358-359+1
18. Bland-Hawthorn, J. & Cecil, G. 1994 "Circumnuclear and Extended Disk Kinematics in NGC 1068." In Proceedings of the conference on *Mass-Transfer Induced Activity in Galaxies*, Lexington Ky, in press (6 pages est.)
19. Shopbell, P., Bland-Hawthorn, J., & Cecil, G. 1994 "The IRAF Fabry-Perot Analysis Package: Incomplete Phase Surface." In Proceedings of the 2nd ADASS Conference, eds. R.J. Hanichsh, R.J.V. Brissebden, J. Barnes, ASP Conference series # 52, 447-451
20. Veilleux, S., Cecil, G., Bland-Hawthorn, J., & Filippenko, A. 1994 "Dynamics of the Superwind Bubble of NGC 3079." In Proceedings of the conference on *Mass-Transfer Induced Activity in Galaxies*, Lexington Ky, in press, 4 pages
21. Shopbell, P., Bland-Hawthorn, J., & Cecil, G., 1992 "The IRAF Fabry-Perot Analysis Package: Ring Fitting." In Proceedings of the 1st ADASS Conference, eds. D.M. Worrall, C. Biemesderfer, J. Barnes, ASP Conference series # 25, 442-446
22. Bland-Hawthorn, J., Shopbell, P. & Cecil, G., 1992 "The Development of an Imaging Fabry-Perot Reduction System within IRAF." In Proceedings of the 1st ADASS Conference, eds. D.M. Worrall, C. Biemesderfer, J. Barnes, ASP Conference Series #25, 393-397
23. Shopbell, P., Bland-Hawthorn, J., & Cecil, G., 1992 "The Theory and Application of Fabry-Perot Phase Correction within IRAF." In Proceedings of the 1st ADASS Conference, eds. D.M. Worrall, C. Biemesderfer, J. Barnes, 442-444
24. Cecil, G. 1991 "The Braided Jets in NGC 4258." *Publ. Astron. Soc. Pacific*, 103, 894-899
25. Bland-Hawthorn, J., Sokolowski, J. & Cecil, G. 1991 "Diffuse Ionized Medium in NGC 1068." *Publ. Astron. Soc. Pacific*, 103, 906-910
26. Cecil, G. 1990 "Experiences with Imaging Spectrophotometers." *Proceedings of Workshop on CCD's in Astronomy II*, A. G. D. Philip, D.S. Hayes, and S.J. Adelman (eds), L. Davis Press, 37-48
27. Bland, J. & Cecil, G. 1990 "Dynamics of the large-scale disk in NGC 1068." In *Dynamics of Astrophysical Disks*, J. A. Sellwood (ed), 143-146
28. Cecil, G. 1989 "Imaging Spectrophotometry of NGC 1068." *Proceedings of ESO Workshop on Extranuclear Activity in Galaxies*, E.J.A. Meurs & R.A.E. Fosbury (eds), 363-368
29. Cecil, G., Bland, J. & Tully, R. B. 1988 "Imaging Spectrophotometry of Ionized Gas in Active Galaxies." In *Active Galactic Nuclei*, Proceedings of Georgia State University, H. R. Miller & P. J. Wiita (eds), 89-93

Books and Articles

1. Pimentel, D., Patzek, T., & Cecil, G. 2010 “Ethanol Production: Energy, Economic, and Environmental Losses”, in *The Energy Reader*, Nader, L. ed, Wiley-Blackwell, Chapter 29, 442-457
2. Cecil, G., Bland-Hawthorn, J., & Veilleux, S. 2000 “The Lives of Quasars.”, *The Scientific American Book of the Cosmos*, St. Martin’s Press, D. H. Levy (ed.), 49-56
3. Bland-Hawthorn, J., & Cecil, G. 1996 “Classical Spectroscopy.”, in “*Experimental Methods in the Physical Sciences*”, Vol 29B, Chapter 18, Academic Press, F.B. Dunning & R. G. Hulet (eds.), 363-391
4. Veilleux, S., Cecil, G., & Bland-Hawthorn, J. 1994 “Colossal Explosions in Nearby Galaxies.” *Scientific American*, Feb. 1996, 98-103 (reprinted 3 times through 2007 in other *Scientific American* compendia)

Book in Preparation

1. Cecil, G. & Hawthorn, J. 2016 “*Observational Astrophysics: Illustrated with Mathematica and Python.*”, 190 pages (est), in preparation