CURRICULUM VITAE
Donald W. McCarthy, Jr.

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Web sites: Astronomy Camp http://www.astronomycamp.org/
NIRCam/JWST education https://lavinia.as.arizona.edu/~dmccarthy/GSUSA/index.html

Personal Synopsis

Dr. McCarthy pioneered high angular resolution at infrared wavelengths from both ground and space-based telescopes by developing new instrumentation, and techniques, for interferometry, speckle imaging, tip/tilt correction, and adaptive optics. With these tools, he was the first to directly detect low mass companions to nearby stars and also imaged the near-infrared emission from the Galactic Center source Sgr A*, discovered planet-wide atmospheric waves on Pluto, and examined the surface characteristics of asteroids and Kuiper Belt Objects. He was the first to co-phase the six apertures of the MMT Observatory, a forerunner of the modern JWST mission. He served on the Science Teams (NICMOS; NIRCam) that built infrared cameras for the Hubble and James Webb Space Telescopes. He developed the PISCES near-IR, wide-field imager and the ARIES imager/spectrograph and personally supported over 600 observing nights for ~50 observers at Arizona observatories.

Dr. McCarthy has a passion for involving all age groups in astronomical research and hands-on, inquiry-based science education in both formal and informal settings. First supported by the Research Corporation, he collaborated with a high school teacher to bring authentic research into classrooms. He has also promoted techniques for improving "Quantitative Literacy" on a national level. Since 1989, his research-oriented Astronomy Camps have immersed teenage students, educators, schools, and adults from around the world at observatories on Mt. Lemmon and Kitt Peak. He directed the education program for the NIRCam project with NASA's James Webb Space Telescope, creating a national partnership with the Girl Scouts of the USA. His most satisfying education publication was in the national magazine for the Alpha Chi Omega sorority, working with the ladies to connect them with their heritage in the night sky.

Contents

CURRICULUM VITAE
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Education

1976	Ph.D. (Astronomy)	The University of Arizona	(advisor Dr. F. Low)
1970	A.B. (Physics)	Princeton University	(advisor: Dr. D. Wilkinson)

Employment

2022-now Designated Campus Colleague (Think Tank) - The University of Arizona

The University of Arizona - Steward Observatory
2014-2022 University Distinguished Outreach Professor
1994-2022 Astronomer
1988 Associate Astronomer
1984 Assistant Astronomer
1976 Postdoctoral position

Pima Community College
2002 Adjunct Faculty

Education-specific Leadership

2014-2020 Faculty Fellow (Coconino & Coronado Halls; Alpha Chi Omega sorority)
2014-2015 Honors Professor
2001-2014 Director, NIRCam's education program for NASA's James Webb Space Telescope
https://lavinia.as.arizona.edu/~dmccarthy/GSUSA/index.html
1994-2022 Lecturer Department of Astronomy – Univ. Arizona
1989-now Director, "Astronomy Camp"
http://www.astronomycamp.org/

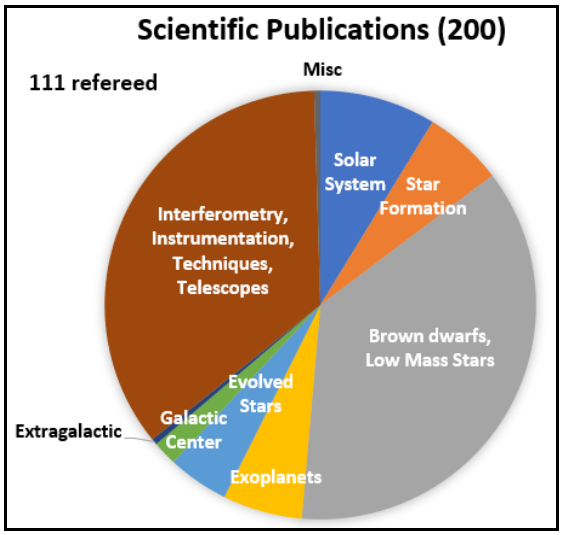
Awards

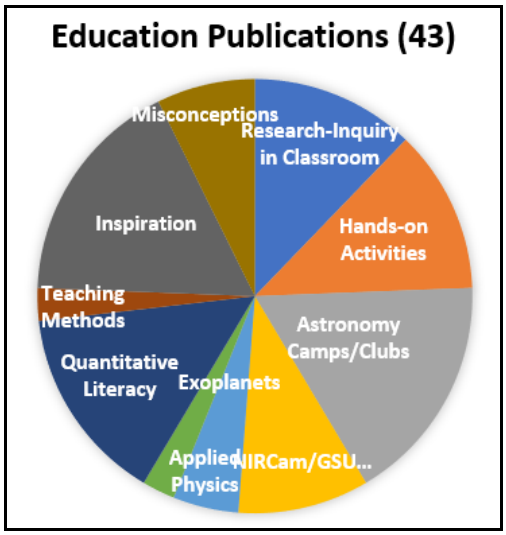
2022 Finalist - *"Five Star Faculty"* award administered by University Honors students
2021 2nd place in Annual Photo contest of Steward Observatory (Comet NEOWISE)
2020 Finalist - *"Five Star Faculty"* award administered by University Honors students
"Legacy Fellow" of the American Astronomical Society
2018 *"Professor of the Semester*" (Chi Omega sorority)
"Alumnus of the Year" for the Blake School
2016 "*Mikelle Smith Omari-Tunkara Outstanding Faculty Fellow in a Residence Hall"*
Guest Football Coach and Guest Basketball Coach for CATS Academics
2015 *"Outstanding Faculty Partner,"* SAEM/AISS Impact Awards
2014 *"University Faculty Outreach Award"*
Ceremonial first-pitch selection for UA softball team vs. Oregon State (Mar 24)
2013 *"Career Teaching Award"* of the College of Science
"Tiger of the Week," Princeton University (January 23, 2013)
2012 *"Education Award"* of the American Astronomical Society
2005 Guest Football Coach at UCLA Homecoming game – CATS Academics
2003 *"Maria and Eric Muhlman Award"* – Astron. Soc. of the Pacific to the NICMOS Science Team
Asteroid 6688 Donmccarthy = 1981 ER_{17}

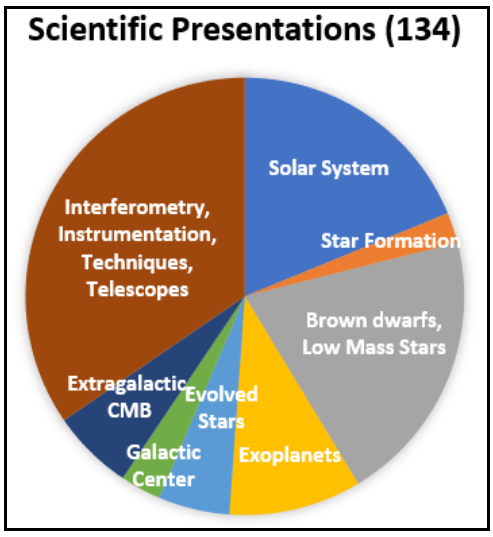
> Citation: *"Since the 1970s, Donald W. McCarthy (b. 1948) has been an instrumental part of astronomy education and research at the University of Arizona. He specializes in infrared astronomy and instrumentation and has been an inspiration to his students and to the hundreds who have participated in his Astronomy Camps."*

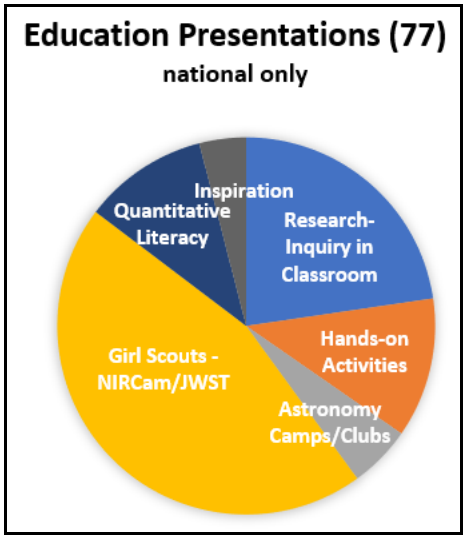
1996 *"Distinguished Achievement in Science Education"* of the College of Science
1993 The Metropolitan Education Commission Recognition (Astronomy Camp)
1992 Council, Advancement of Science Educ. (CASE), Silver Medal (Astronomy Camp)
1991 Finalist - *"Five Star Faculty*" award administered by University Honors students
1984 Honorable Mention award winner in Hughes Griffith Observer writing contest

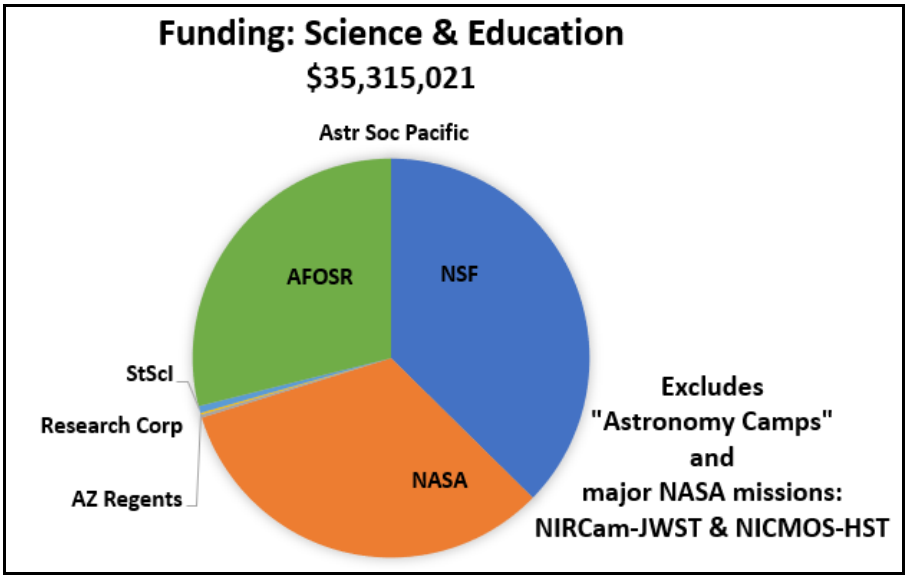
Visual Summaries: Publications, Presentations, Funding











Publications

Categorized by science & education (refereed, non-refereed, miscellaneous)

Scientific Publications (Refereed Journals)

111. *Carbon Monoxide Emission Lines Reveal and Inverted Atmosphere in the Ultra Hot Jupiter WASP-33b Consistent with an Eastward Hot Spot*, van Sluijs, L., Birkby J., Lothringer, J., Lee, E., Crossfield, I., Parmentier, V., Brogi, M., Kulesa, C., **McCarthy, D.**, Powell, K., and Charbonneau, D., 2022, MNRAS, submitted

110. *The James Webb Space Telescope Mission*, Gardner, J., **et al.**, 2022, PASP, submitted

109. *NIRCam Performance on JWST In Flight*, Rieke, M., **et al.**, 2022, PASP, submitted

108. *The Absolute Age of the Globular Cluster M15: The Impact of High Resolution LBT/PISCES Images*, Monelli, M., Testa,. V., Bono, G., Ferraro, I., Iannicola, G., Fiorentino, G., Arcidiacono, C., Massari, D., Boutsia, K., Briguglio, R., Carini, R., Close, L., Cresci, G., Esposito, S., Fini, L., Fumana, M., Guerra, J., Hill, J., Kulesa, C., Mannucci, F., **McCarthy, D.**, Pinna, E., Puglisi, A., Quiros-Pacheco, F., Ragazzoni, R., Riccardi, A., Skemer, A., and Xompero, M., 2015, AJ, 812, 12 pp.

107. *The M-dwarfs in Multiples (MinMs) Survey - I. Stellar Multiplicity Among Low-mass Stars Within 15 pc*, Ward-Duong, K., Patience, J., DeRosa, R., Bulger, J., Rajan, A., Goodwin, S.,Parker, R., **McCarthy, D.,** and Kulesa, C., 2015, MNRAS, 449, Issue 3, p. 2618-2637

106. *Star and Jet Multiplicity in the High-mass Star Forming Region IRAS 05137+3919*, Cesaroni, R., Massi, F., Arcidiacono, C., Beltran, M.T., Persi, P., Tapia, M., Molinari, S., Testi, L. Busoni, L., Riccardi, A., Boutsia, K., Bisogni, S., **McCarthy, D.**, and Kulesa, C., 2015, Astronomy & Astrophysics, 581, A124, 46 pp.
Also: *VizieR Online Data Catalog: SFR IRAS 05137+3919 star and jet multiplicity*

105. *A High Resolution Image of the Inner-shell of the P Cygni Nebula in the Infra-red [Fe II] Line*, Arcidiacono, C., Ragazzoni, R., Morossi, C., Franchini, M., Di Marcantonio, P., Kulesa, C., **McCarthy, D.**, Briguglio, R., Xompero, M., Quiros-Pacheco, F., Pinna, E., Boutsia, K., Paris, D., 2014, MNRAS, 443, 1142-1150.

104. *The VAST Survey - IV. A wide brown dwarf companion to the A3V star ζ Delphini*, DeRosa, R., Patience, J., Ward-Duong, K., Vigan, A., Marois, C., Song, I., Macintosh, B., Graham, J., Doyon, R., Bessell, M., Lai, O., **McCarthy, D.**, and Kulesa, C., 2014, MNRAS, 445, 3694-3705.

103. *Adaptive Optics Images. III. 87 Kepler Objects of Interest*, Dressing, C., Adams, E., Dupree, A., Kulesa, C., and **McCarthy, D.**, 2014, AJ, 148, 15 pp.

102. *Variable Accretion Processes in the Young Binary-star System UY Aur*, Stone, J., Eisner, J., Salyk, C., Kulesa, C., and **McCarthy, D.**, 2014, AJ, 792, 9 pp.

101. *Adaptive Optics Images. II. 12 Kepler Objects of Interest and 15 Confirmed Transiting Planets*, Adams, E., Dupree, A.K., Kulesa, C., and **McCarthy, D.**, 2013, AJ, 146, 9.

100. *Submillimeter Observations of IRAS and WISE Debris Disk Candidates*, Bulger, J., Hufford, R., Schneider, A., Patience, J., Song, I., De Rosa, R.J., Rajan, A., Dowel, C.D., **McCarthy, D.**, and Kulesa, C. 2013, Astronomy & Astrophysics, 556, A119, 10 pp.

99. *A Close-up View of a Bipolar Jet: Sub-arcsecond Near-infrared Imaging of the High-mass Protostar IRAS 20126+4104*, Cesaroni, R., Massi, F., Arcidiacono, C., Beltran, M.T., **McCarthy, D.**, Kulesa, C., Boutsia, K., Paris, D., and Quiros-Pacheco, E., 2013, Astronomy and Astrophysics, 549, id.A146, 5 pp.

98. *LBT Observations of the HR 8799 Planetary System. First Detection of HR 8799e in H band*, Esposito, S. and **35 co-authors**, 2013, Astronomy and Astrophysics, 549, id.A52, 11 pp.

97. *Eleven New Heavily Reddened Field Wolf-Rayet Stars*, Smith, J.D.T., Cushing, M., Barletta, A., **McCarthy, D.**, Kulesa, C., and Van Dyk, S.D., 2012, AJ, 144, 166-175.

96. *Adaptive Optics Images of Kepler Objects of Interest*, Adams, E.R., Ciardi, D.R., Dupree, A.K., Gautier, T.N., Kulesa, C., and **McCarthy, D.**, 2012, AJ, 144, 42-50. Erratum: 2013, 146, 71.

95. *First Light LBT AO Images of HR 8799 bcde at 1.6 and 3.3 μm: New Discrepancies Between Young Planets and Old Brown Dwarfs*, Skemer, A.J. and **47 co-authors**, 2012, ApJ, 753, 14-26.

94. *The Gray Needle: Large Grains in the HD 15115 Debris Disk from LBT/PISCES/Ks and LBTI/LMIRcam/L' Adaptive Optics Imaging*, Rodigas, T.J. et al. and **54 co-authors**, 2012, ApJ, 752, 57-70.

93. *High-Resolution Images of Orbital Motion in the Orion Trapezium Cluster with the LBT AO System*, Close, L.M. et al. and **31 co-authors**, 2012, ApJ, 749, 180-191.

92. *Kepler-21b: A 1.6 R_{Earth} Planet Transiting the Bright Oscillating F Subgiant HD 179070*, Howell, S. and **66 co-authors**, 2012, ApJ, 746, 123-151.

91. *Kepler-14b: A Massive Hot Jupiter Transiting an F Star in a Close Visual Binary*, Buchhave, L.A. and **48 co-authors**, 2011, ApJS, 197:3, 10 pp.

90. *Characteristics of Planetary Candidates Observed by Kepler. II. Analysis of the First Four Months of Data*, Boruki, W.J. and **70 coauthors**, 2011, ApJ, 736, 19-41.

89. *The High Albedo of the Hot Jupiter Kepler-7 b*, Demory, B-O. and **13 co-authors**, 2011, ApJ (Letters), 735, L12-17.

88. *A Ground-Layer Adaptive Optics System with Multiple Laser Guide Stars*, Hart, M., Milton, N.M., Baranec, C., Powell, K., Stalcup, T., **McCarthy, D.**, Kulesa, C., and Bendek, E., 2010, Nature, 466, pp. 727-729.

87. *Time-Variable Accretion in the TW Hya Star/Disk System*, Eisner, J., Doppmann, G., Najita, J., **McCarthy, D.**, Kulesa, C., Swift, B., and Teske, J., 2010, ApJL, 722, L28-32.

86. *Wide-Field Star Cluster Image Sharpening with Laser- Guided Adaptive Optics*, Hart, M., Milton, N. M., Baranec, C., Powell, K., Stalcup, T., **McCarthy, D.**, Kulesa, C., and Bendek, E., 2010, Nature, 466, 727-729.

85. *The Reddening Towards Cassiopeia A's Supernova: Constraining the ^{56}Ni Yield*, Eriksen, K., Arnett, **D., McCarthy**, D., Young, P., 2009, ApJ, 697, 29-36.

84. *Buoyancy Waves in Pluto's High Atmosphere: Implications for Stellar Occultations*, Hubbard, W., **McCarthy, D.**, Kulesa, C., Benecchi, S., Person, M., Elliot, J., and Gulbis, A., 2009, Icarus, 204, 284-289.

83. *On-sky Wide-field Adaptive Optics Correction Using Multiple Laser Guide Stars at the MMT*, Baranec, C., Hart, M., N. Mark Milton, Stalcup, T., Powell1, K., Snyder, M., Vaitheeswaran, V., **McCarthy, D.**, and Kulesa, C., 2009, ApJ, 693, 1814-1820.

82. *Long-wavelength Density Fluctuations Resolved in Pluto's High Atmosphere*, **McCarthy, D.**, Hubbard, W., Kulesa, C., Benecchi, S., Person, M., Eliott, J., and Gulbis, A. 2008, AJ, 136,1519-1522.

81. *Waves in Pluto's Upper Atmosphere*, Person, M., Elliot, J., Gulbis, A. Zuluagal, C., Babcock, B., McKay, A., Pasachoff, J., Souza, S., Hubbard, W., Kulesa, C., **McCarthy, D.**, Benecchi, S., Levine, S., Bosc, A., Ryan, E., and Ryan, W., 2008, AJ, 136, 1510-1518.

80. *An Imaging Survey for Extrasolar Planets around 45 Close, Young Stars with the Simultaneous Differential Imager at the Very Large Telescope and MMT*, Biller, Beth A.; Close, Laird M.; Masciadri, Elena; Nielsen, Eric; Lenzen, Rainer; Brandner, Wolfgang; **McCarthy, Donald**; Hartung, Markus; Kellner, Stephan; Mamajek, Eric; Henning, Thomas; Miller, Douglas; Kenworthy, Matthew; Kulesa, Craig, 2007, ApJSS, 173, 143-165.

79. *Comet Hale-Bopp in Outburst: Imaging the Dynamics of Icy Particles with HST/NICMOS*, **D. W. McCarthy**, S. R. Stolovy, S. D. Kern, H. Campins, S. M. Larson, N. H. Samarasinha, and A. Ferro, 2007, Icarus, 189, 184-195.

78. IAUC 8825: (134340) [22334-2008/04-R1] Pluto, March 31, 2007

77. M.P.E.C. 2005-M61, Apollo asteroid discovery: 2005 MG5, June 28, 2005

76. M.P.E.C. 2005-M09, Apollo asteroid discovery: 2005 MA, June 19, 2005

75. *Hα-Derived Star Formation Rates for Three z~0.75 EDisCS Galaxy Clusters*, Finn, R., Zaritsky, D., **McCarthy, D.**, Poggianti, B., Rudnick,G., Halliday, C., Milvang-Jensen, B., Pello, R., and Simard1, L., 2005, Ap.J., 630, 206-227.

74. *R- and J-band Photometry of Comets 2P/Encke and 9P/Tempel 1*, Hergenrother, C., Mueller, B., Campins, H., Samarasinha, N., and **McCarthy, D.**, 2006, *Icarus*, 181, 156-161.

73. *Deep Near-Infrared Observations of L 1014: Revealing the Nature of the Core and its Embedded Source*, Huard, T., Myers, P., Murphy, D., Crews, L., Lada, C., Bourke, T., Crapsi, A., Evans, N., **McCarthy, D.**, and Kulesa, C., 2006, ApJ, 640, 391-401.

72. *Simultaneous Visible and Near-infrared Time Resolved Observations of the Outer Solar System Object (29981) 1999 TD_{10}*, Mueller, B., Hergenrother, C., Samarasinha, N., Campins, H., and **McCarthy, D.**, 2004, Icarus, 171, 506-515.

71. *Hα-derived Star Formation Rates for the z = 0.84 Galaxy Cluster Cl J0023+0423B*, R. Finn, D. Zaritsky, and **D. McCarthy**, 2004, ApJ, 604, 141-152.

70. *High Resolution Images of Orbital Motion in the Trapezium Cluster: First Scientific Results from the MMT Deformable Secondary Mirror Adaptive Optics System*, L. Close, F. Wildi, M. Lloyd-Hart, G. Brusa, D. Fisher, D. Miller, A. Riccardi, P. Salinari, **D. McCarthy**, R. Angel, R. Allen, H. Martin, R. Sosa, M. Montoya, M Rademacher, M. Rascon, D. Curley, N. Siegler, and W. Duschl, 2003, Ap.J., 599, 537-547.

69. *A Near-Infrared Wide-Field Proper Motion Search for Brown Dwarfs*, J. L. Hinz, **D. W. McCarthy**, D. A. Simons, T. J. Henry, J. D. Kirkpatrick, and P. C. McGuire, 2002, AJ, 123, 2027-2032.

68. *Precise Masses for Wolf 1062 AB From Hubble Space Telescope Interferometric Astrometry and McDonald Observatory Radial Velocities*, G. Benedict, B. McArthur, O. Franz, L. Wasserman, T. Henry, T. Takato, I. Strateva, J. Crawford, P. Ianna, **D. McCarthy**, E. Nelan, W. Jefferys, W. van Altena, P. Shelus, P. Hemenway, R. Duncombe, D. Story, A. Whipple, A. Bradley, and L. Fredrick, 2001, A.J., 121, 1607-1613.

67. *Galaxies in the Fields of z~1.5 Radio-Loud Quasars*, P. Hall, M. Sawicki, P. Martini, R. Finn, C. Pritchet, P. Osmer, **D. McCarthy**, A. Evans, H. Lin, and F. Hartwick, 2001, A. J., 121, 1840-1862.

66. *PISCES: A Wide Field 1-2.5 Micron Camera for Large Aperture Telescopes*, **D. McCarthy**, J. Ge, J. Hinz, R. Finn, and R. de Jong, 2001, Pub. A.S.P., 113, 353-361.

65. *Compositional Variation on the Surface of Centaur 8405 Asbolus*, S.D. Kern, **D.W. McCarthy**, M.W. Buie, R.H. Brown, H. Campins, and M. Rieke, 2000, Ap. J. (Letters), 542, L155-159.

64. *NICMOS/HST Post-Perihelion Images of Comet Hale-Bopp in Outburst*, **D. McCarthy**, S. Stolovy, S. Kern, G. Schneider, A. Ferro, H. Spinrad, J. Black, and B. Smith 1997, Earth, Moon and Planets (1999), 78, 243-249.

63. *An Infrared Determination of the Reddening and Distance to Dwingeloo* 1, V. Ivanov, A. Alonso Herrero, M. Rieke, and **D. McCarthy** 1999, A. J., 118, 826-830.

62. *The Optical Mass-Luminosity Relation at the End of the Main Sequence (0.08 to 0.20 M_o)*, T. Henry, O. Franz, L. Wasserman, G. Benedict, P. Shelus, P. Ianna, D. Kirkpatrick, and **D. McCarthy** 1999, Ap. J., 512, 864-873.

61. *Halo Characteristics and Their Influence on Companion Searches at the Starfire Optical Range*, P. Ryan, R. Fugate, R. Angel, **D. McCarthy**, S. Mohanty, and D. Sandler 1998, Applied Optics, 37, #30, 7035-7043.

60. *First Results of Nulling Interferometry at the Multiple Mirror Telescope*, P. Hinz, J.R.P. Angel, W. Hoffmann, **D. McCarthy**, P. McGuire, M. Cheselka, J. Hora, and N. Woolf 1998, Nature, 395, 251-253.

59. *First Astronomical Images Obtained with Adaptive Optics Using a Sodium Laser Guide Star*, M. Lloyd-Hart, J. Angel, T. Groesbeck, T. Martinez, B. Jacobsen, B. McLeod**, D. McCarthy**, E. Hooper, and E. Hege 1998, Ap. J., 493, 950-954.

58. *The First Definitive Binary Orbit Determined with the HST Fine Guidance Sensors: Wolf 1062 (Gliese 748)*, Franz, O., Henry, T., Wasserman, L., Benedict, G., Ianna, P., Kirkpatrick, J., **McCarthy, D.**, Bradley, A., Duncombe, R., Fredrick, L., Hemenway, P., Jefferys, W., McArthur, B., Nelan, E., Shelus, P., Story, D., van Altena, W., and Whipple, A. 1997, A. J., 116, 1432-1439.

57. *A Search for Companions to Nearby Southern M Dwarfs with Near-infrared Speckle Interferometry*, Ch. Leinert, T. Henry, A. Glindemann, and **D. McCarthy** 1997, Astr. and Astrophys., 325, 159-166.

56. *Structure of Saturn's Mesosphere from the 28 Sgr Occultations*, W. B. Hubbard, C. Porco, D. Hunten, G. Rieke, M. Rieke, **D. McCarthy**, V. Haemmerle, J. Haller, B. McLeod, L. Lebofsky, R. Marcialis, J. Holberg, R. Landau, L. Carrasco, J. Elias, M. Buie, E. Dunham, S. Persson, T. Boroson, S. West, R. French, J. Harrington, J. Elliot, W. Forrest, J. Pipher, R. Stover, B. Sicardy, and A. Brahic 1997, *Icarus*, 130, 404-425.

55. *The Multiplicity of Pre-Main Sequence Stars in Southern Star Forming Regions*, A. Ghez, **D. McCarthy**, J. Patience, and T. Beck 1997, Ap. J., 481, 378-385.

54. *The Peculiar Population of Hot Stars at the Galactic Center*, P. Tamblyn, G. Rieke, M. Hanson, L. Close, **D. McCarthy**, and M. Rieke 1996, Ap. J., 456, 206-216.

53. *High-resolution V, I, and K-band Imaging of Faint Field Galaxies from the HST Medium-Deep Survey*, S. B. Mutz, R. A. Windhorst, D. Wittman, L. M. Close, and **D. W. McCarthy** 1997, A. J., 113, 1537-1547.

52. *Speckle Imaging Measurements of the Relative Tangential Velocity of the Components of T Tauri Binary Stars*, A. M. Ghez, A. J. Weinberger, G. Neugebauer, K. Matthews, and **D. W. McCarthy** 1995, *A. J.*, 110, 753-765.

51. *General Relativistic Flux Modulations in the Galactic Center Blackhole Candidate Sgr A**, J. Hollywood, F. Melia, L. M. Close, **D. W. McCarthy**, and T. A. DeKeyser 1995, Ap. J. (Letters) 1995, 448, L21-24.

50. *The Fate of Solid Matter Around HR 4796A*, M. Jura, A. Ghez, **D. W. McCarthy**, R. C. Smith, and P. G. Martin 1995, *Ap. J.*, 445, 451-456.

49. *Adaptive Optics Experiments Using Sodium Laser Guide Stars*, M. Lloyd-Hart, J. R. P. Angel, B. Jacobsen, D. Wittman, R. Dekany, **D. McCarthy**, E. Kibblewhite, W. Wild, B. Carter, and J. Beletic, 1995, Ap. J., 439, 455-473.

48. *Infrared Photometry of the Black Hole Candidate Sgr A**, L. M. Close, **D. W. McCarthy**, and F. Melia 1994, Ap. J. (Letters), 439, 682-686.

47. *The Luminosity Function at the Faint End of the Main Sequence: Results of a Deep, Large-area, CCD Survey for Cool Dwarfs*, J. D. Kirkpatrick, J. T. McGraw, T. R. Hess, C. C. Dahn, H. C. Harris, J. Liebert, and **D. W. McCarthy** 1994, The Ap.J. Suppl. Series, 94, 749-788.

46. *Ross 614B: A Redetermination of the Masses One Orbit Later*, D. S. Johnson, T. J. Henry, and **D. W. McCarthy** 1994, A. J., 107, 1551-1555.

45. *High Angular Resolution Images of Vesta at 1.65 μm*, **D. W. McCarthy, Jr.**, J. D. Freeman, and J. D. Drummond 1994, *Icarus*, 108, 285-297.

44. *High Resolution Imaging with an Adaptive Secondary Mirror*, L. Close and **D. W. McCarthy, Jr.** 1994, Pub. A.S.P., 106, 77-86.

43. *Low-Mass Companions to Nearby Stars: Spectral Classification and Its Relation to the Stellar/Substellar Break*, J. D. Kirkpatrick and **D. W. McCarthy**, Ap.J. 1994, 107, 333-349.

42. *Progress in Diffraction-Limited Imaging at the Multiple Mirror Telescope*, M. Lloyd-Hart, R. Dekany, D. Sandler, D. Wittman, R. Angel, and **D. McCarthy** 1994, J. Opt. Soc. Am. A, 11, 846-857.

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40. *Mass Luminosity Relation for Red Dwarf Stars***,** T. J. Henry and **D. W. McCarthy** 1993, *A. J.*, 106, 773-789.

39. *The Performance of Partial Adaptive Correction at the Multiple Mirror Telescope*, J. C. Christou and **D. W. McCarthy** 1993, Pub. A.S.P., 105, 1322-1329.

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63-65. *Advancing Astronomy for All*, 2018 Astronomical Society of the Pacific, Conference Series, 524,

Engage with Girl Scouts and their Space Science Badges, Harman, P., Chin, W., Grissom, C., DeVore, E., Fahy, J., Henricks, J., Kersh, E., Summer, T., White, V., **McCarthy, D.**, Lebofsky, L., and Mayo, L., p. 265

Girl Scout Space Science Badges, Bridges, and Teams, Harman, P., Chin, W., Grissom, C., Friedman, W., Fahy, J., Henricks, J., Kersh, E., Summer, T., White, V., **McCarthy, D.**, Lebofsky, L., and Mayo, L., p. 171

Building Community Around Girl Scout Space Science Badges, Fahy, J., Henricks, J., Harman, P., White, V., Summer, T., Berg, J., Chin, W., Grissom, C., Friedman, W., **McCarthy, D.**, Lebofsky, L., Mayo, L., and Kersh, E., p. 59

62. *Girl Scout Badges: Engaging Girls in Planetary Science*. Harman P., Chin W., Grissom C., Friedman W., **McCarthy D.**, Lebofsky L., Mayo L., Fahy J., Kersh., E., Henricks J., White V., and Summer T., DPS 50th Annual Meeting 2018 Abstract 202.03

61. *Girl Scout Space Science Badges and Beyond: Collaborative Learning for Girls and NASA Sci Act Collaboration*, Harman, P., Chin, W., Grissom, C., Friedman, W., **McCarthy, D.**, Lebofsky, L., Mayo, L., Fahy, J., Henricks, J., Kersh, E., White, V., and Summer, T., 2018 AGU Fall Meeting, abstract ED41E-1242

60. *Reaching for the Stars: NASA Science for Girl Scouts (Girl Scout Stars)*, DeVore, E., Harman, P., **et al.** 2017, 227th AAS Meeting #229, abstract 439.04

59. *Inaugural Girl Scout Destination Astronomy Camp*, Lebofsky, L., **McCarthy, D.**, Wright, J., Wright, R., Mace, M., Floyd, C., 2017, DPS Meeting 49, abstract 116.06

58. *Girl Scout Stars: Engaging Girl Scouts in the 2017 Total Eclipse*, Harman, P., DeVore, E., **et al.**, 2017, AGU Fall Meeting, abstract ED34B-04

57. *Girl Scout Camps and Badges: Engaging Girls in NASA Science*, Harman, P., DeVore, E., **et al.**, AGU Fall Meeting, abstract ED54A-01, (Dec 2017)

56. *Results of Studying Astronomy Students' Science Literacy, Quantitative Literacy, and Information Literacy*, Buxner, S., Impey, C., Follette, K., Dokter, E., **McCarthy, D.**, Vezino. B., Formanek, M., Romine, J., Brock, L., Neiberding, M., and Prather, E., American Astronomical Society, January 2017, Bull A.A.S., 229, #213.01.

55. *Examining the Role of Numeracy in College STEM Courses: Results from the Quantitative Reasoning for College Science (QuaRCS) Assessment Instrument*, Follette, K., **McCarthy, D.**, Dokter, E., Buxner, S., and Prather, E., American Astronomical Society 227th meeting (Jan 2016),

#214.03.

54. *Reaching for the Stars: NASA Science for Girl Scouts (Girl Scout Stars)*, DeVore, E., Harman, P., Berg, J., Friedman, W., Fahy, J., Henricks, J., Chin, W., Hudson, A., Grissom, C., Lebofsky, L. A., **McCarthy, D.**, Gurton, S., White, V., Summer, T., Mayo, L., Patel, R., and Bass, K., 2016, AGU Fall Meeting Abstract ED43B-0855, (Dec 2016)

53. *Leadership Workshops for Adult Girl Scout Leaders*, Lebofsky, L., **McCarthy, D.**, DeVore, E., Harman, P. Reaching Stars Team, 2016, AAS, DPS meeting #48, #417.03.

52. *Using Exoplanet Models to Explore NGSS and the Nature of Science and as a Tool for Understanding the Scientific Results from NIRCam/JWST*, Lebofsky, L., **McCarthy, D.**, Higgins, M., and Lebofsky, N., 2014, AAS, DPS meeting #46, #212.17.

49-51. Celebrating Science: Putting Education Best Practices to Work, ASP Annual Conference (August 4-6, 2014) in Burlingame, CA

Doodling During Class: Benefits of Real-time Feedback, **McCarthy, D.** (unpublished poster)

The Development and Validation of an Assessment Tool for Evaluating Quantitative Literacy in Introductory Science Courses, Follette, K., **McCarthy, D.**, Dokter, E., Buxner, S.

RE-NUMERATE: Restoring Essential Numerical Skills and Thinking in Astronomy Education, Follette, K., **McCarthy, D.**

47-48. American Astronomical Society, 223rd meeting, January 2014:

How to Make a Club from Scratch: The Beginning of the University of Arizona Astronomy Club, Robertson, A., Hardegee-Ulman, K, Carleton, T., Towner, A., Walker-LaFollette, M, Beiging, J., and **McCarthy, D.**, American Astronomical Society meeting #223, #160.01, January 2014

Science Literacy's Neglected Twin: Numeracy, Follette, K. **McCarthy, D.**, Dokter, E.F., and Buxner, S., American Astronomical Society meeting #223, #322.05, January 2014

43-46. Ensuring STEM Literacy: a National Conference on STEM Education and Public Outreach, Proceedings of a Conference held at San Jose State University on 20-24 July, 2013. Edited by James G. Manning, Joseph B. Jensen, Mary Kay Hemenway, and Michael G. Gibbs. ASP Conference Series, 2014, vol. 483,

Inspiration is 'Mission Critical': A Panel Discussion, **McCarthy, D.** and Lebofsky, L., 449-457.

Science Literacy's Neglected Twin: Numeracy, Follette, K. and **McCarthy, D.**, pp. 31-44.

NASA's Role in Addressing Misconceptions: Scale of Our Solar System and Other Planetary Systems, Lebofsky, L., **McCarthy, D.**, Higgins, M., and Lebofsky, N., pp. 187-193.

Mission and Research Scientists in NASA EPO and STEM Education: The Results of 15 Years of EPO, Lebofsky, L., **McCarthy, D.**, Higgins, M., Mueller, B., and Lebofsky, N., pp. 375-378.

40-42. American Astronomical Society, 221st meeting, January 2013:

Thinking Big for 25 Years: Astronomy Camp Research Projects, Hooper, E.J., **McCarthy, D.W.**, Benecchi, S.D., Henry, T.J., Kirkpatrick, J.D., Kulesa, C., Oey, M.S., Regester, J., Schlingman, W.M., #246.01.

Lighting the Fire for 25 Years: The Nature and Legacy of Astronomy Camp, **McCarthy, D.W.**, Hooper, E.J., Benecchi, S.D., Henry, T.J., Kirkpatrick, J.D., Kulesa, C., Oey, M.S., Regester, J., Schlingman, W.M., #246.11.

The California-Arizona Minority Partnership for Astronomy Research and Education (CAMPARE): Astronomy Education Research, Serna, G.E., Eckenrode, J., **McCarthy, D.**, Wallace, C.S., Prather, E.E., Brissenden, G., Rudolph, A.L., Collaboration of Astronomy Teaching Scholars (CATS), #248.06.

39. *Scientists and Educators Working Together: Everyone Teaches, Everyone Learns*, Lebofsky, L., Lebofsky, N., **McCarthy, D.**, Canizo, T., Schmitt, W., and Higgins, M., 2013, American Astronomical Society, DPS meeting #45, #117.05

38. *Using Models to Address Misconceptions in Size and Scale Related to the Earth, Moon, Solar System, and Universe*, Lebofsky, L. A., Lebofsky, N.R., **McCarthy, D.W.**, Higgins, M.L., Salthouse, K., and Canizo, T.L., 2012, AAS DPS meeting #44, #411.06.

37. *Bringing Astronomy Activities and Science Content to Girls Locally and Nationally: A Girl Scout NIRCam Collaboration*, Lebofsky, L.A., Higgins,. M.L., **McCarthy, D.W.**, and Lebofsky, N.R., 2012, 43rd Lunar and Planetary Science Conf, March 19-23, 2012 at The Woodlands, Texas. LPI Contribution No. 1659, id.1303

33-36. Communicating Science: A National Conference on Science Education and Public Outreach. Proceedings of a Conference held at Tucson, Arizona, USA 4-8 August 2012. Edited by J. Barnes, C. Shupla, J.G. Manning and M.G. Gibbs. San Francisco: Astronomical Society of the Pacific, 2013, 473:

Bringing Astronomy Activities and Science Content to Girls Locally and Nationally: A Girl Scout and NIRCam Collaboration, Higgins, M., Lebofsky, L., **McCarthy, D.**, and Lebofsky, N., p. 355.

Practical Lessons From the First Decade of EPO Partnership Between NIRCam/JWST and the GSUSA, **McCarthy, D.**, Lebofsky, L., Schlingman, W., and Higgins, M., p. 289.

Using Models to Address Misconceptions in Size and Scale Related to the Earth, Moon, Solar System, and Universe, Lebofsky, L. A., Canizo, T.L., Lebofsky, N.R., **McCarthy, D.W.**, Higgins, M.L., and Salthouse, K., p. 285.

RE-NUMERATE: A Workshop to Restore Essential Numerical Skills and Thinking via Astronomy Education, **McCarthy, D.** and Follette, K., p. 79.

32. *An Informed Approach to Improving Quantitative Literacy and Mitigating Math Anxiety in Undergraduates Through Introductory Science Courses*, Follette, K. and **McCarthy, D.**, 2012, Connecting People to Science: A National Conference on Science Education and Public Outreach. Proceedings of a conference held at Baltimore, Maryland USA 30 July - 3 August 2011. ASP Conference Series, 457. Edited by J.B. Jensen, J.G. Manning, M.G. Gibbs, and D. Daou. San Francisco: Astronomical Society of the Pacific, pp. 295-298

29-31. American Astronomical Society meeting #219, 2012:

Bringing Astronomy Activities and Science Content to Girls Locally and Nationally: A Girl Scout and NIRCam Collaboration, Lebofsky, L., Higgins, M.L., **McCarthy, D.W.**, and Lebofsky, N.R., #350.06.

The California-Arizona Minority Partnership for Astronomy Research and Education (CAMPARE): Partnering Students to Astronomy at the University of Arizona's Astronomy Camp, Saldivar, H., **McCarthy, D.**, and Rudolph, A.L., #147.04.

Fostering the Development of Quantitative Life Skills Through Introductory Astronomy: Can it be Done? Follette, K., and **McCarthy, D.W.**, #227.01.

27-28. American Astronomical Society, 217th meeting, Jan 2011:

The California-Arizona Minority Partnership for Astronomy Research and Education (CAMPARE): An Educational Experience for Undergraduates at the University of Arizona Alumni Association's Astronomy Camp, Lemon, C., **McCarthy, D.**, and Rudolph, A., Bull AAS, 43, #145.07.

Nurturing The STEM Pipeline: Graduate Student Leadership In NIRCam's Ongoing E/PO Mission For JWST, Schlingman, W., Stock, N., Teske, J., Tyler, K., Biller, B., Donley, J., Hedden, A., Knierman, K. and Young, P., Bull AAS, 43, #431.01. (authored by **McCarthy** but not delivered by him)

25-26. Earth and Space Science: Making Connections in Education and Public Outreach. Proceedings of a conference held at the University of Colorado, Boulder, Colorado, USA 31 July-4 August 2010. San Francisco: Astronomical Society of the Pacific, 2011,443:

Near Infrared Camera (NIRCAM): Making Models, Building Understanding, **McCarthy, D.**, Lebofsky, L., Higgins, M., and Lebofsky, N., pp. 280-283.

A Portable/Traveling Human Orrery, Lebofsky, L. A., **McCarthy, D. W., Jr.**, Higgins, M. L., Lebofsky, N. R., p. 63.

24. *Near Infrared Camera (NIRCam): Making Models, Building Understanding*, Lebofsky, L., **McCarthy, D.**, Higgins, M., and Lebofsky, N., 41st Lunar and Planetary Science Conference, held March 1-5, 2010 in The Woodlands, Texas. LPI Contribution No.1533, p. 1856.

23. *James Webb Space Telescope's Near Infrared Camera (NIRCam): Making Models, Building Understanding*, Lebofsky, L., **McCarthy, D.**, Higgins, M., and Lebofsky, N., 2010, DPS meeting #42, #37.01, Bull. AAS, 42, 967.

22. *Astronomy Camp = IYA x 22: 22 Years of International Astronomy Education*, Hooper, E., **McCarthy, D.**, and Camp staff, 2010, American Astronomical Society, AAS Meeting #215, #445.09, Bull. A.A.S., 42, p. 412.

21. *The James Webb Space Telescope's Near-Infrared Camera (NIRCam): Making Models, Building Understanding***, McCarthy, D.**, Lebofsky, L. A., Higgins, M. L., Lebofsky, N. R., Earth and Space Science: Making Connections in Education and Public Outreach. Proceedings of a conference held at the University of Colorado, Boulder, Colorado, USA 31 July-4 August 2010. San Francisco: Astronomical Society of the Pacific, 2011, p. 280.

20. *Astronomy Patch Day: An Interactive Astronomy Experience for Girl Scouts*, K. Knierman, **D. McCarthy**, and K. Schutz, 2005, American Astronomical Society, AAS Meeting #207, #67.02, Bull AAS, 37, 1263.

17-19. Astronomical Society of the Pacific 117th Annual Meeting, 2005, "Building Community: The Emerging EPO Profession":

Astronomy Camp, **D. McCarthy**, E. Hooper, C. Kulesa, and J. Regester

Linking Girls to the Sky: NIRCam/JWST's National Outreach to the Girl Scouts, **D. McCarthy**

Astronomy Patch Day: An Interactive Astronomy Experience for Girl Scouts, K. Knierman, **D. McCarthy**, K. Schutz

16. *NIRCam/JWST Education and Public Outreach: "Linking Girls to the Sky"*, K. Knierman, P. Young, **D. McCarthy**, L. Lebofsky, Conference on Women in Astronomy II. Poster

15. *Science Education with LSST*, Astronomical Society, Jacoby, S., Khandro, K., Larson, A., **McCarthy, D.**, S. Pompea, S., and Shara, M., American Astronomical Society, 205th annual meeting, 2004, Bull. A.A.S., 36, #5, p.1531.

13-14. American Geophysical Union Fall meeting, San Francisco, CA, December 2003:

Implementing Authentic Astronomy Research in the Classroom: The TLRBSE Experience, S. Pompea, S. Croft, C. Walker, J. Lockwood, and **D. McCarthy**

*Solar Astronomy as a Means to Promote Authentic Science Research in a Teacher Professional Development Progra*m, C. Walker, S. Croft, S. Pompea, C. Plymate, and **D. McCarthy**, #ED52A-01.

12. *NIRCam/NGST Education and Public Outreach: "Linking Girls with the Sky,"* **D. McCarthy**, L. Lebofsky, T. Slater, M. Rieke, and S. Pompea, 2002, DPS meeting #31.06, Bull. A.A.S., 34, 896.

11. *Solar Data in the Classroom: The TLRBSE Experience*, S. Pompea, C. Walker, S. Croft, and **D. McCarthy**, 2002, AGU meeting (session = Geophysics Data in the Classroom), Eos Trans. AGU, 83(47), ED11A-0033.

10. *Teacher Leaders in Research Based Science Education*, T. Rector, S. Jacoby, J. Lockwood, and **D. McCart**hy, American Astronomical Society, 199th annual meeting, 2001, Bull. A.A.S., 33, #4, 1343.

8-9. American Astronomical Society, 198th annual meeting, 2001, Bull. A.A.S., 33, #2:

The Use of Astronomy in Research-Based Science Education, T. Rector, S. Jacoby, J. Lockwood, and **D. McCarthy**, 820.

Teacher-Leaders in Research-Based Science Education, T. Rector, S. Jacoby, J. Lockwood, and **D. McCarthy**, 809.

7. *The Use of Astronomy in Research Based Science Education*, T. Rector, S. Jacoby, J. Lockwood, and **D. McCarthy**, American Astronomical Society, 194th annual meeting, 1999, Bull. A.A.S., 31, #3: 940.

6. *Steward Observatory Student Radio Telescope*, C.K. Walker, B. Jones, J. Clarke, C.E. Walker, **D. McCarthy**, 1999, National Radio Science Meeting (Boulder, CO)

5. *The Use of Astronomy in Research Based Science Education*, S. Jacoby, J. Lockwood, and **D. McCarthy**, American Astronomical Society, 191st meeting, 1998, Bull. A.A.S., 29, #5: listed in late paper titles, p. 8.

4. *A "Road Map" for Science Education*, **D. W. McCarthy**, 1996, Announcer, (American Association of Physics Teachers, winter meeting, Jan. 1997), 26, 87.

3. *Learning by Doing - An Astronomical Research Course for Secondary Schools: A University/High School Collaboration*, J. F. Lockwood**, D. W. McCarthy**, S. Baliunas, 1991, Bull. A.A.S., 22, 1236.

2. *Research Oriented Summer Astronomy Camp for Teenagers*, **D. W. McCarthy**, K. Dow, T. J. Henry, D. Kirkpatrick, J. Morrill, D. Iadevaia, L. Dunlap, 1990, Bull. A.A.S., 22, 737.

1. *Astronomical Research in the High School Classroom: A University-High School Research Partnership*, J. F. Lockwood, **D. W. McCarthy**, 1989, Bull. A.A.S., 21, 1066.

Research Funding
categorized by science & education

Scientific Funding
NASA:

"Near Infrared Camera for JWST (NIRCam)," Dr. M. Rieke, NASA, NAS5-02105, 7/02 to 12/2018 (Phases A-E), $324,784,805

"Probing the Gas Content of Terrestrial and Giant Planet Forming Regions of Protoplanetary Disks," J. Eisner and D. McCarthy, …..

"An Infrared Study of Spacecraft Targeted Comets," H. Campins, M. Belton, S. Larson, D. McCarthy, D. Britt, 4/1/01-3/31/04, $155,500

"Interferometry with the Large Binocular Telescope," NASA/JPL # 1226582, 05/29/01 – 1/07, $4,134,126

"The First Nulling & Simultaneous Differential Imaging Survey for Massive Planets Around Nearby Stars," NASA #NAG5-12086, 05/01/02 – 4/30/05, $235,577

"Nulling interferometry at the Large Binocular Telescope in support of TPF," P. M. Hinz, J.R.P. Angel, W.F. Hoffmann, D.W. McCarthy, N.J. Woolf, 10/1/00-9/3/04, $5,000,000

"The Development of a Mission and Technology Roadmap for the Exploration of Neighboring Planetary Systems," J.R.P. Angel (PI) and 27 other investigators, 4/95, $140,000.

"Calibrating The Mass-Luminosity Relation at the End of the Main Sequence," D. McCarthy's part of Hubble Space Telescope's observations, T. J. Henry, GO-06047.06-94A, 10/95-9/96, $5,119 (year 1 of 3).

"Near Infrared Observations of Titan's Lower Atmosphere," P. Smith, M. Lemmon, and D. McCarthy, 10/94-9/95, $50,199.

"Near-Infrared Camera and Multi-object Spectrometer (NICMOS) Guaranteed Time Observer," R. Thompson et al., NAG5-3042, 8/95-3/2001, $26,007,930

"Observational & Theoretical Studies of Circumstellar Material at Very High Spatial Resolution," Origin of Solar Systems Program, McCarthy, NAGW 2254, 11/90-11/93, $75,717.

"Detector Evaluation for a Deep Optical/Infrared Survey and Second Generation Space Telescope Instruments," M. Rieke, D. McCarthy, G. Rieke, and R. Thompson, 2/90-3/91, $200,000.

NSF:

"Innovative Multiband Filters," Rhoads, J., Malhotra, S., Scowen, P., and McCarthy, D. NSF, #1006993, 9/10-9/13, $400,000

"The 20/20 Telescope – A New Concept for the GSMT," NSF #AST-0138347, 7/01/02 – 7/07, $1,898,586

"Computed Tomography Imaging Spectrometer for Astronomical Applications," E. Hege, D. McCarthy, E. Dereniak and M. Descour, 2000, two years, $431,821

"Advanced Instrumentation for Adaptively Corrected…," NSF #AST9731178, 09/01/98 – 8/31/04, $1,004,238

"Advanced Instrumentation for Adaptively Corrected Telescopes: Detection of Faint Stellar Companions and High Resolution Spectroscopy," M. Lloyd-Hart, J. Angel, D. Sandler, D. McCarthy, and R. Fugate, 4/1/98-3/31/01, $1,589,147

"High Resolution Infrared Imaging at the 6.5m MMT with Adaptive Optics," D. McCarthy, 7/96-6/98, AST-9623788, $699,061.

"Adaptive Optics and High Resolution Imaging," D. McCarthy, J.R.P. Angel, 6/92-9/95, AST-9203336, $1,041,893.

"Two-Dimensional Infrared Speckle Imaging," McCarthy, 4/1/89-3/31/92, AST-8822465, $304,900.

"Applications of Array Detectors in Infrared Spatial Interferometry," McCarthy and Low, 4/86-4/89, AST-8519506, $422,200.

"Implementing New Capabilities of the Multiple Mirror Telescope: Operation in the Thermal Infrared and as a Coherent Array," M. Lebofsky and D. McCarthy, 5/86-10/88, AST-8418188, $290,500.

"Infrared Spatial Interferometry," F. Low and D. McCarthy, 2/15/83-9/30/86, AST-8218782, $361,066.

"Infrared Spatial Interferometry: A Phased-Photometer for the MMT," F. Low, 6/15/81-3/31/83, AST-8108431, $142,800.

"Continued Development of Spatial Interferometry at Infrared Wavelengths," F. Low, 6/1/79-10/30/81, AST-7902869, $216,700.

"Development of Spatial Interferometry at Infrared Wavelengths," F. Low, 3/1/77-8/31/79, AST-7701261, $200,000.

Space Telescope Science Institute - AURA, Inc.:

"Completing a Near-Infrared Search for Very Low Mass Companions to Stars within 10 pc," T. Henry, D. Golimoski, J. Krist, C. Burrows, H. Ford, D. McCarthy, and D. Schroeder, GO 7894, 145 orbits in Cycle 7+

"Grism Spectra of Centaurs and TNO's from 1-2 Microns," D. McCarthy, H. Campins, S. Stolovy, B. Brown, $31,414, GO 7822, 8 orbits in Cycle 7+
supplemental funding in 2000, $17,672, added M. Buie as co-I

"A High-Resolution Proper Motion Study of the Ionized Gas Near Sgr A,"* S. Stolovy, F. Melia, F. Yusef-Zadeh, and D. McCarthy, GO 7842, 4 orbits in Cycle 7+

"Mineralogic Mapping of the Surface of Asteroid 4 Vesta," 7/1/97-10/31/98, D. McCarthy
plus nine collaborators, $21,234, GO 7443, 8 orbits in Cycle 7

"The Formation of Young Solar-Type Multiple and Single Stars," D. W. McCarthy and
A. Ghez, Hubble Fellowship for Ghez, HF-1031.01-92A, 10/92-9/93, $65,048.10/93-9/94, $62,940.

Air Force Office of Scientific Research:

"Exploiting Adaptive Optics with Deformable Secondary Mirrors; Development of Tomographic Laser Guide Star Wavefront Sensing at the 6.5m MMT and Laser Adaptive Optics at the 6.5m MMT Telescope: High Resolution Imaging of Thermal Sources and Spacecraft," AFOSR F49620-01-1-0383, 15 May 01 –31 July 05, $8,155,000

"Advanced Adaptive Optics Development at the 6.5m MMT Telescope," M. Lloyd-Hart, P. Hinz, J. Angel, L. Close, D. McCarthy, 6/1/02-10/31/03, $2,040,334

Education Funding

Astronomical Society of the Pacific:

"A Portable/Traveling Human Orrery," McCarthy, D., Lebofsky, L., and Lebofsky, N., $2,480 (9/09 to 9/10), Simple Effective Education and Dissemination (SEED) Grants For Astronomy Researchers, (money directed to Tucson's Sahuaro Girl Scout Council).

Arizona Board of Regents:

"STOP-LITE: Science Teachers Observing Pollution - Light Interference Tracking Experiment," L. Lebofsky, D. McCarthy, N. Lebofsky, T. Potter, J. Becker, D. Davis, March 1, 1999 - February 29, 2000, $49,865.

NASA:

"Reaching for the Stars," McCarthy D., and Lebofsky, L., Jan 2016-Jan. 2021, $677,695.

"Near Infrared Camera (NIRCam) E/PO," Dr. M. Rieke, NASA, NAS502105, 7/02-4/30/2024 (Phases A- E), NAS5-02105, $466,115,825, (McCarthy is the E/PO leader)

Total expended for E/PO program (2001-2014): $863,254

"Nature of Light Through the Eyes of the Hubble Space Telescope," STScI, HST-EO-10639.06, 1/06-2/08, $19,900

"Internet Tools for Research Based Science Education," IDEA proposal, T. Rector, J. Lockwood, D. McCarthy, and S. Jacoby, 4/1/99-3/31/01, $26,396.

"NICMOS: Opportunities for High School Research," NASA Initative to Develop Education through Astronomy (IDEA) grant, D. McCarthy, 1/1/95, $5,995.

"Variable Star Research for Pre-College Students," D. McCarthy and J. Lockwood, 9/91-8/92, Supplement, $5,025.

NSF:

"An Informed Approach to Improving Quantitative Literacy and Mitigating Math Anxiety in Undergraduates through Introductory Science Courses," D. McCarthy, K. Follette, and E. Dokter, # 1140398, 9/1/12-8/31/15, $199,535.

"Teacher Leaders in Research Based Science Education," S. Jacoby, J. Lockwood, D. McCarthy, and T. Rector, 5/1/01-4/30/06, $2,496,850.

"The Use of Astronomy in Research Based Science Education," S. Jacoby, J. Lockwood, and D. McCarthy, 3/1/97-2/28/2001, $494,189.

"Astronomy Related Teacher In-Service Training (ARTIST)," Lebofsky, Dunlap, and McCarthy, 3/92-6/95, $975,000.

"Adaptive Optics and High Resolution Imaging," McCarthy, 10/1/92-9/30/93, (REU Award), $12,100.

"Two-Dimensional Infrared Speckle Imaging - Research for Undergraduates," D. McCarthy (PI) and Diana Johnson, 9/26/91-9/30/92, Supplement for undergraduate education, $6,050.
NSF Program Director added $6,050 to research grant for PI educational projects, REU awards, 4/1/89-3/31/92

Research Corporation:

"Research in the Classroom - A National Curriculum Program Phase II - Expansion and Networking Research Projects Across the United States," Lockwood, McCarthy, and Roth, $40,000.
$9,000, 22 July, 1993 (temp. funding)

"Speckle Interferometry of Nearby Red Dwarf Stars Using an InSb 2D Infrared Camera," McCarthy and Lockwood, 2/93, $2,895.

"A New National Science Curriculum: Doing Research in High School Classrooms," McCarthy and Lockwood, 6/91-6/93, $19,500.

"High Resolution Imaging of Low Mass Companions to Nearby Stars," McCarthy and Lockwood, High School - College Research Partnership Program; also a "Flinn Foundation Grant of the Research Corporation"
summer of 1990 $6,000
summer of 1989 $5,500 (plus a $1,000 supplement)

summer of 1988 $5,000

Graduate Students Supervised or Mentored

In addition to the following graduate students, I provided access to IR observing instruments (PISCES, ARIES) on many telescopes (LBT, MMT, 90", 61", McMath-Pierce, Star Fire) and supported the IR observations of many graduate students, and faculty.

Kate Follette	(Ph.D. 2014)
Wayne Schlingman	(Ph.D. 2012)
Karen Knierman	(Ph.D. ASU 2012 Arizona/NASA Space Grant Fellowship mentor)
Jackie Monkiewicz	(Ph.D. ASU ~2018 instrumentation projects and observing support)
Koby Smith	(Masters, Optical Sciences)
Margaret Turnbull	(Ph.D. 2004; NSF CATTS mentor)
Rose Finn	(Ph.D. 2003; NASA Fellowship mentor)
Jorge Carvano	(Brazil)
Joannah Hinz	(Ph.D. 2003)
Phil Hinz	(Ph.D. 2001)
Subu Mohanty	(Ph.D. Harvard ~2002)
Laird Close	(Ph.D. 1996)
Dave Wittman	(Ph.D. 1997)
Jeff Lockwood	(Ph.D. Education, 1994)
Davy Kirkpatrick	(Ph.D. 1992)
Brian McLeod	(through second year project)
Todd Henry	(Ph.D. 1991)
Jonathan Freeman	(Ph.D. 1990; Applied Math)

Service

Service (Department)

Education and Public Outreach listed separately

2019-2022	Director of Undergraduate Majors Program	
2001-2022	NIRCam on James Webb Space Telescope:	Science team & E/PO leader
	NICMOS on Hubble Space Telescope:	Science team member
2014-now	Presented weekly "Question of the Day" to Astronomy Club	
2020-now	Provided weekly "rooftop observing" sessions for students (science & non-science majors)	

Observing Support:

1998-2013	PISCES wide-field IR camera; 522 nights on 1.5, 2.3, and 6.5m MMT ~50 observers (grads, postdocs, UA/ASU/NAU faculty, Public Access)
2011-2013	PISCES wide-field IR camera served as primary AO-camera on LBT
2001-2014	ARIES IR camera/spectrometer on MMT with adaptive optics ~35 observers (grads, postdocs, UA/ASU/NAU faculty, Public Access) AO engineering for NGS and Laser Guide Stars

Past Committees:

Academic Program
Awards
Center for Astronomical Adaptive Optics
Diversity and Inclusion

MMT Council Chair (2009-2012; 2015-2022)
Peer Teaching Evaluation
Promotion and Continuing Status
Telescope Allocation (1985-1988; 2004-2009) [Chair 1987; 2006-2009; 2018-2019]

Service (University)

Education and outreach listed separately

Past Committees:

- College of Science Climate Committee
- Faculty Fellow serving in residence halls (Coconino, Coronado Halls)
- Math Dept. Committee on Promotion and Continuing Status (chair)
- Provost's Committee on Promotion & Continuing Status
- Faculty of Science Promotion & Tenure

Service (National)

E/PO listed separately

Past Committees:

- American Astronomical Society:
  - Chambliss Book Award
  - Graduate workshop facilitator for discussion of Professional Masters' Program
  - DPS Local Organizing Committee in charge of Education Program for Oct. '96
  - Education
- Member of Hubble Space Telescope Decade II Panel
- National Science Foundation review panel for …
  - Adaptive Optics Development Program (AODP)
  - ATI
  - Small Business Innovation Research proposal
  - Instrumentation Proposal Review Panel (chair)
- SIRTF Science Working Group
- Gemini Adaptive Optics Working Group
- Interferometry Panel of the Astronomy and Astrophysics Survey
- NOAO 8m telescope interferometry steering group
- Kitt Peak User's Committee
- NNTT infrared imaging/photometry team member

Courses Taught & Created

University of Arizona

Teacher and Course Evaluations, and rankings, available here:

https://scsonline.oia.arizona.edu/index.php

Supported preceptors in every course via Teaching Teams Program or Independent Study

Honor's Contracts		several per year
Honor's First Year Projects		several per year
Student-Faculty Interaction		several activities every semester
AST 100		1991, 1993, 1994, 1996, 1997
ASTR 170B1	(The Physical Universe)	2003-2021 additional section for Schedule for Success students a "buffer course" for Center for English as a Second Language students also attended by Taglit program for disability students
ASTR 196	(Astron. Problem Solving)	2014-2022 (created the course)
ASTR 199	(Independent Study)	
ASTR 201	(Cosmology)	2004-2022 also attended by Taglit program for disability students
ASTR 296	(seminar guest lecturer)	annual lecture
ASTR 337	(Connecting with the Sky)	2015-2022 (created the course)
ASTR 392	(Independent Study)	
ASTR 398	(Honors Research)	2022
ASTR 400a	(Theor Astrophy: Stars)	1995 (substitute)
ASTR 400b	(Theor Astrophy: Galaxies)	2021
ASTR 492	(research)	2021-2022
ASTR 499	(Independent Study)	many

ASTR 418/518	(Instrumentation)	guest lecturer; provide CCD-spectrometer
ASTR 597	(NOAO's TLRBSE)	2003,2004; online course with 20 educators (helped create)
HNRS 595H	(Kissling course)	2003
HNRS 195I	(Profiles in Curiosity)	2014-2015 (created the course)
NATS 102	(The Physical Universe)	1999- 2001, 2003-2005

- designated a "buffer course" for Center for English as a Second Language students

UNVR & LASC 197 collaborating courses for preceptors

Arizona State University

~1972 Course instructor while a graduate student at the University of Arizona

Pima Community College (West campus)

ASTR 101	Astronomy	2002
ASTR 102	Solar System	2002

Education/Outreach Activities (University)

Current Committees:

Advisory Boards:

Women in Science & Engineering
Univ. Arizona NASA Space Grant Consortium

Past Activities:

Faculty advisor:

Twirling Line Club
Campus Crusade for Christ
Wildcats for Christ

Advising **C**enter for **E**xploratory **S**tudents (ACES)
Flinn Scholarship Program
Final Ph.D. examination committees:

Ms. T. Cañizo	(Education, 2001)
Mr. J. Lockwood	(Education, 1994)

Workshop at Teaching Academy about Quantitative Literacy
Pre-Health Interview Committee
Science and Math Education Center (SAMEC) Committee
Future Science Teachers' Research Program
State review panel for Eisenhower Science & Math proposals
Committee on the Earth Science Teaching Majors
Faculty of Science Undergraduate Majors
University Science Teachers' Colloquium Series
Honors Dialogue Program

Education/Outreach Activities (Community)

Current Activities:

Sun City Vistoso Astronomy Club: Speaker & student support at Astronomy Camps

Past Activities:

Yearlong telescope building project at Pueblo High School (100 students/faculty)
Project ASTRO at NOAO
Coronado K-8 school (Astronomy Camp w/ Sun City Vistoso)
funded $10K scholarships to Boys & Girls Club to Astronomy Camp
Discovery Park Science Center - helped design and plan exhibits and educational themes
Ongoing invited talks/demonstrations/tours/career-shadowing in local schools. Over 100 school visits (pre-school - college), usually with multiple presentations.

Education/Outreach Activities (National)

Past Committees:

ASP Awards Committee member (Chair)

Publication Committee (Chair)

Past Activities:

Board of Directors of the Astronomical Society of the Pacific (ASP; 2009-2012)
chair of awards and publication committees
Nominating Committee
"Research-Based Science Education" at NOAO
Div. Planetary Science (DPS) Local Organizing Committee for Education Program

"Astronomy Camps"

The Astronomy Camp programs pioneered a unique research-based approach to STEM education. Using the Sky Island environments of observatories in the Catalina mountains and at Kitt Peak National Observatory, Astronomy Camp provides authentic, "immersion" experiences. Since 1988, thousands of Campers from all U.S. states and 20 foreign countries "became scientists," residing at the mountaintop observatories, operating research-class telescopes and technology, keeping nighttime hours, interacting with leading scientists, interpreting their own observations, investigating their own questions and curiosities, and most importantly having fun doing so. More than 30 Camp alumni received Ph.D. degrees in a variety of fields. In Astronomy alone, our alumni are now Professors and Directors of major programs at over 50 universities and 10 national labs. The Campers, and their families, provided unexpected benefits to The University of Arizona, including capital improvements and the enrollment of ~70 new undergraduate and graduate students, new faculty, postdoctoral fellows, and engineering staff. The Astronomy Camp infrastructure and educational approach were leveraged heavily in UArizona's successful NASA proposal to build NIRCam for the James Webb Space Telescope (below).
http://www.astronomycamp.org/

NIRCam/JWST Mission education program with the GSUSA

The University's original NASA proposal (2001) to build NIRCam for the James Webb Space Telescope required an official education proposal comprising 1-2% of the total budget. Using the Astronomy Camp heritage and infrastructure (above), we proposed a formal national partnership with the Girl Scouts of the USA (GSUSA) to (1) improve STEM education for young women (K-14); (2) train their adult leaders in astronomical concepts relevant to JWST/NIRCam; (3) develop associate STEM activities for use at Troop-levels; and (4) build a long-term relationship between NIRCam-GSUSA that could quickly and effectively promote scientific discoveries from JWST.

From 2002-2019, we conducted 34 "Train the Trainer" in-person workshops for GSUSA leaders at our Mt. Lemmon Observatories, Biosphere 2, and our local GS Council's facilities. These 397 leaders represent 98 of the 112 official Councils in 47 U.S. states, D.C., Guam, Japan, and Puerto Rico. In 2015, we continued our in-person workshops with the SETI Institute and helped develop the first-ever Space Science badges (6) for all age levels. We continue to support 274 of these leaders via a monthly Newsletter and often provide assistance with their special events.

To date, NIRCam's E/PO partnership with the GSUSA has led to 34 national presentations and publications and, as mentioned above, to six Space Science badges engaging millions of young girls and women in the science of astronomy.
https://lavinia.as.arizona.edu/~dmccarthy/GSUSA/index.html

Personal

Military Service

1970-1978 U.S. Army Reserve (Captain; Signal Corps)

1976 Signal Corps Officer Basic Course (Class leader of 70 officers; August, GA)
Awards: *"The Distinguished Graduate"*

1966-1970 Army R.O.T.C. - Princeton University
Awards: *"Distinguished Military Graduate"*
Lt. Col. John U. D. Page Award

Finalist:

1977 NASA's original selection of Space Shuttle Mission Specialist (Astronaut Candidate)