

CURRICULUM VITAE

Donald W. McCarthy, Jr.

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NIRCam/JWST education <https://lavinia.as.arizona.edu/~dwmccarthy/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.

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Science (140)	17
Education (78)	25
Research Funding:	
Science	\$29,392,792 exclusive of NICMOS-HST, NIRCam-JWST 30
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Personal:	Military service; NASA Space Shuttle

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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

	The University of Arizona - Steward Observatory
2023-now	Outreach Instructional Specialist III
2022-2023	Designated Campus Colleague (Think Tank – UArizona)
2014-2022	University Distinguished Outreach Professor
1994-2022	Astronomer
1988	Associate Astronomer
1984	Assistant Astronomer
1976	Postdoctoral position

	Pima Community College
2002	Adjunct Faculty

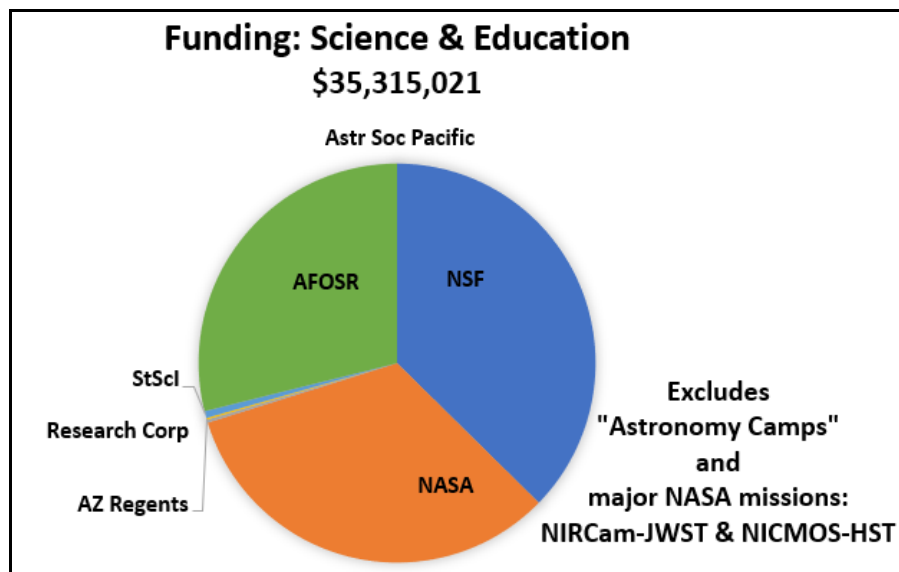
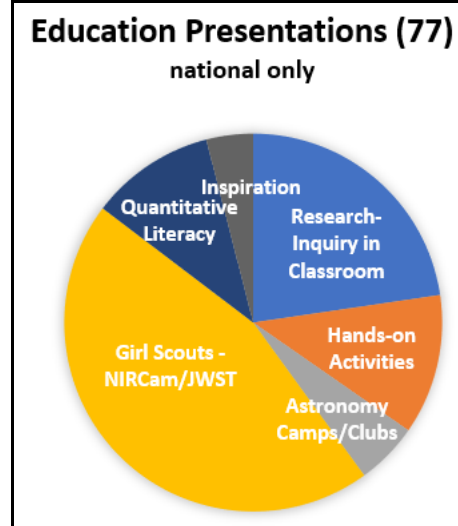
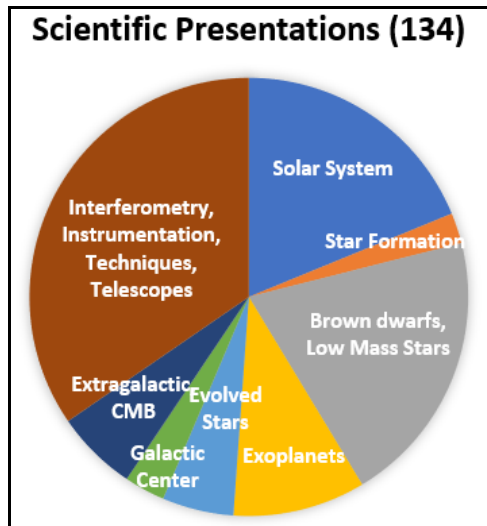
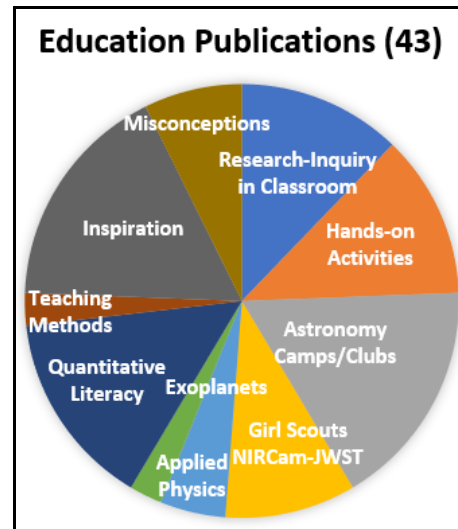
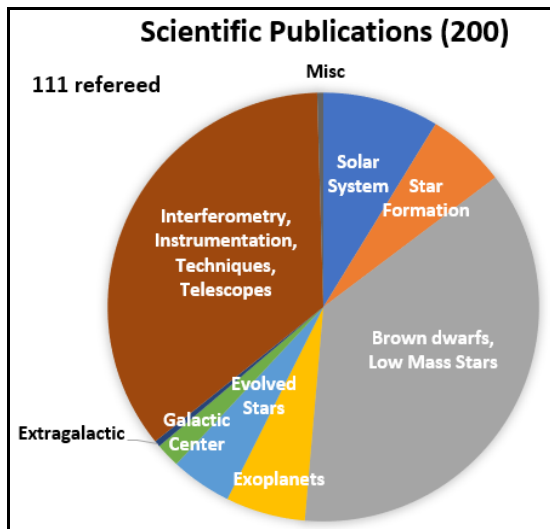
Education-specific Leadership

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

2023	Klumpke-Roberts Award of the Astronomical Society of the Pacific
2023	To the Science Team of NIRCam for JWST: The 2023 DGPh (German Photographic Society) Prize in "Science, Medicine, and Technology"
2022	Finalist - "Five Star Faculty" award administered by University Honors students
2021	2 nd 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 <i>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."</i>
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 through 2022



Publications

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

Scientific Publications (Refereed Journals)

114. *JWST/NIRCam Imaging of Young Stellar Objects. III. Detailed Imaging of the Nebular Environment around the HL Tau Disk*, Mullin, C., Dong, R., Leisenring, J., Cugno, G., Greene, T., Johnstone, D., Meyer, M., Wagner, K., Wolff, S., Boyer, M., Horner, S., Hodapp, K., **McCarthy, D.**, Rieke, G., Rieke, M., and Young, E. 2024, AJ, 167, #4, 10 pp.
113. *JWST/NIRCam Imaging of Young Stellar Objects. II. Deep Constraints on Giant Planets and a Planet Candidate Outside of the Spiral Disk Around SAO 206462*, Cugno, Leisenring, J., Wagner, K., Mullin, C., Greene, T., Johnstone, D., Meyer, M., Wolff, S., Beichman, C., Boyer, M., Horner, S., Hodapp, K., Kelly, D., **McCarthy, D.**, Roellig, T., Rieke, G., Rieke, M., Standberry, J., and Young, E. 2024, AJ, 167, #4, 14 pp.
112. *JWST/NIRCam Imaging of Young Stellar Objects. I. Constraints on Planets Exterior to the Spiral Disk Around MWC 75.8*, Wagner, K., Leisenring, J., Cugno, G., Mullin, C., Dong, R., Wolff, S., Greene, T., Johnstone, D., Meyer, M., Beichman, C., Boyer, M., Horner, S., Hodapp, K., Kelly, D., **McCarthy, D.**, Roellig, T., Rieke, G., Rieke, M., Sitko, M., Stansberry, J., and Young, E. 2024, AJ, 167, #4, 10 pp.
111. *Carbon Monoxide Emission Lines Reveal an 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.**, and Charbonneau, D., 2023, MNRAS, 522, #2, 2145-2170.
110. *The James Webb Space Telescope Mission*, Gardner, J., **et al.**, 2023, PASP, 135, #1048, id 068001, 24 pp.
109. *Performance of NIRCam on JWST in Flight*, Rieke, M., **et al.**, 2023, PASP, 135, #1044, id 028001, 14 pp.
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.
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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

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.
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95. *First Light LBT AO Images of HR 8799 bcde at 1.6 and 3.3 μ m: 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.
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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.
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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.
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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. *H α -Derived Star Formation Rates for Three $z \sim 0.75$ EDisCS Galaxy Clusters*, Finn, R., Zaritsky, D., **McCarthy, D.**, Poggianti, B., Rudnick, G., Halliday, C., Milvang-Jensen, B., Pello, R., and Simard, L., 2005, *ApJ*, 630, 206-227.
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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, *ApJ*, 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.
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67. *Galaxies in the Fields of $z \sim 1.5$ Radio-Loud Quasars*, P. Hall, M. Sawicki, P. Martini, R. Finn, C. Pritchett, P. Osmer, **D. McCarthy**, A. Evans, H. Lin, and F. Hartwick, 2001, *A. J.*, 121, 1840-1862.
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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.
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75. *Girl Scouts and Subject Matter Experts: Making Connections*, Harman, P., Chin, W., Grissom, C., Friedman, W., **McCarthy, D.**, Lebofsky, L., Mayo, L., Fahy, J., Henricks, J., White, V., and Summer, T., 51st Lunar and Planetary Science Conference, March 2020, LPI Contribution No. 2326, #2408.
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72. *Reaching for the Stars: Engaging Girl Scouts, Volunteers and Families in NASA Science*. Harman, P., Chin W., Grissom C., Friedman W., **McCarthy D.**, Lebofsky, L., Mayo L., Fahy J., Henricks J., White V., Summer T., Bass-Rockman K., and Patel-Rockman R. Poster: NASA SciAct Annual Meeting 2019.
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- 68-70. *Advancing Astronomy for All*, Proceedings of a conference held in the California Wine Country, Sonoma Valley, California, ASP Conference Series, 524, Oct. 2018, Edited by G. Schultz, J. Barnes, and L. Shore.

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

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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

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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

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- 17-19. Astronomical Society of the Pacific 117th Annual Meeting, 2005, “Building Community: The Emerging EPO Profession”:
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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.
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"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 Initiative 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 Center for Exploratory Students (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

“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)