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Academic Rank:

Professor, Aerospace Engineering Sciences, University of Colorado, appointed September, 1985

Degrees with fields, institutions and dates:

B.S., Aerospace Engineering, University of Texas, 1962; M.S., Aerospace Engineering, University of Texas, 1965; Ph.D., Aerospace Engineering, University of Texas, 1968.

Other related experience:

Director, Colorado Center for Astrodynamics Research, University of Colorado, 1985-present; Associate Chair for Graduate Studies, Dept. of Aerospace Engineering Sciences, 2008-. Senior Research Engineer, Center for Space Research, University of Texas at Austin, 1983-85; Technical Group Supervisor, Seasat Geophysical Evaluation Manager, Jet Propulsion Laboratory, Pasadena, CA, 1970-83; Aerospace Technologist, Johnson Space Center, Houston, TX, 1967-70; Lecturer, The University of Houston, Dept. of Mechanical Engineering 1968-70; Research Engineer, Texas Center for Research, Austin, TX, 1964-67; Engineer, Ling-Temco-Vought Corporation, Dallas, TX, 1962-63.

Consulting:

Scientific Consultant, Jet Propulsion Laboratory, Naval Research Laboratory, General Electric, Kaman Sciences Corp, Langley Research Center, The University of Texas at Austin, Stanford University, Ball Aerospace.

Peer Reviewed Publications: Names in bold are first authors. No names in bold means I was first or the only author. One of my post docs, current or former students or I was first author for 88 of the papers.

1. "Some Qualitative Characteristics of Lunar Satellite Orbits," American Astronautical Society Science and Technology Series, Vol. 11, 1967, pp. 45-64, co-authored with B. D. Tapley.
2. "An Approximate Solution of the Short-Term Motion of a Lunar Satellite," Journal of Spacecraft and Rockets, May 1969, pp. 513-519, co-authored with **B. D. Tapley**.
3. "An Encke-Type Special Perturbation Method," Celestial Mechanics, Vol.2, No. 1, May 1970, pp. 103-113.
4. "Application of Brouwer's Artificial Satellite Theory to the Computation of the State Transition Matrix," NASA TN D-5934, August 1970, co-authored with J. Kirkpatrick.

5. "Sequential Estimation of the State and Observation Error Covariance Matrix," AIAA Journal, Vol. 9, No. 2, February, 1971, pp. 212-217, co-authored with B. D. Tapley.
6. "Empirical Bayes Estimation of Observation Error Variances in Linear Systems," AIAA Journal, Vol. 9, No. 6, June 1971, pp. 1183-1187, co-authored with **H. F. Martz**.
7. "Mariner 9 Celestial Mechanics Experiment: Gravity Field and Pole Direction of Mars," Science, Vol. 175, January 21, 1972, pp. 317-320, co-authored with **J. Lorell**, E. Christensen, J. F. Jordan, P. Laing, W. L. Martin, W. Sjogren, I. I. Shapiro, R. Reisenberg, and G. Slater.
8. "Special Perturbations Utilizing Osculating Reference States," Celestial Mechanics, Vol. 9, No. 2, 1972, pp. 41-53, co-authored with E. J. Christensen and L. K. Seversike.
9. "Gravity Field of Mars from Mariner 9 Tracking Data," Icarus, Vol. 18, No. 2, February 1973, pp. 304-316, co-authored with the Mariner 9 Celestial Mechanics Experiment Team.
10. "Mariner 9 Television Observations of Phobos and Deimos," Journal of Geophysical Research, Vol. 78, No. 20, July 10, 1973, pp. 4313-4326, co-authored with **J. B. Pollack**, J. Ververka, M. Noland, C. Sagan, T. Duxbury, C. Acton, W. Hartmann and B. Smith.
11. "Determination of the Satellite Orbit of Mariner 9," Celestial Mechanics, Vol. 9, No. 2, 1974, pp. 395-414, co-authored with E. J. Christensen, A. J. Ferrari, J. F. Jordan and S. J. Reinhold.
12. "Viewing Phobos and Deimos for Navigating Mariner 9," Journal of Spacecraft and Rockets, March 1974, pp. 215-222, co-authored with **T. C. Duxbury** and N. Jerath.
13. "Mars Physical Parameters from Observations of the Natural Satellites and Doppler Tracking," Journal of Geophysical Research, Vol. 79, No. 32, November 10, 1974, pp. 4837-4844.
14. "Orbit Determination for Mariner 9 Using Radio and Optical Data," Journal of Spacecraft and Rockets, Vol. 12, No. 7, July 1975, pp. 439-441, co-authored with **S. N. Mohan**.
15. "The Motions of Phobos and Deimos from Mariner 9 TV Data," Celestial Mechanics, Vol. 12, 1975, pp. 77-88, co-authored with T. C. Duxbury.
16. "Secular Acceleration of Phobos and Q of Mars," Icarus, Vol. 27, 1976, pp. 51-53, co-authored with **J. C. Smith**.
17. "The Mass of Phobos from Viking Flybys," Geophysical Research Letters, Vol. 4, No. 12, December 1977, pp. 555-557, co-authored with E. J. Christensen, C. E. Hildebrand, and B. C. Williams.
18. "Viking First Encounter of Phobos: Preliminary Results," Science, Vol. 199, January 6, 1978, pp. 61-64, co-authored with the **Phobos Experiment Team**.

19. "Viking Satellite Orbit Determination," *Journal of Guidance and Control*, Vol. 1, November-December 1978, pp. 385-386, co-authored with **C. E. Hildebrand**, E. J. Christensen, D. H. Boggs, H. Hokikian and J. F. Jordan.
20. "Orbit Analysis for Seasat-A," *The Journal of the Astronautical Sciences*, Vol. XXVI, No. 4, October-December 1978, pp. 315-342, co-authored with **E. Cutting** and J. Frautnick.
21. "The Deimos Mass Experiment: Planning and Preliminary Results," *Natural and Artificial Satellite Motion*, University of Texas Press, 1979, pp. 353-368, co-authored with **T. C. Duxbury** and C. E. Hildebrand
22. "Seasat Mission Overview," *Science*, Vol. 204, No. 4400, June 29, 1979, pp. 1405-1406, co-authored with J. A. Dunne and D. B. Lame.
23. "Seasat Altimeter Calibration: Initial Results," *Science*, Vol. 204, No. 4400, June 29, 1979, pp. 1410-1412, co-authored with **Seasat Altimeter Experiment Team**.
24. "Seasat Performance Evaluation: The First Two Steps," *IEEE Journal of Oceanic Engineering*, Vol. OE-5, No. 2, April 1980, pp. 72-73, co-authored with D. B. Lame, J. A. Dunne, A. J. Spear, and C. A. Yamarone.
25. "The Seasat Precision Orbit Determination Experiment," *The Journal of the Astronautical Sciences*, Vol. XXVIII, No. 4, October-December 1980, pp. 315-325, co-authored with **B. D. Tapley**.
26. "A Survey of the Goals and Accomplishments of the Seasat Mission," *Oceanography from Space*, Plenum Press Marine Science Series, 1981, pp. 3-14, co-authored with D. Lame and P. Rygh.
27. "Seasat: Space Age Oceanography," *Nature*, Vol. 293, No. 5834, October 22-28, 1981, p. 608.
28. "The Seasat Altimeter Data and Its Accuracy Assessment," *Journal of Geophysical Research*, Vol. 87, No. C5, April 30, 1982, pp. 3179-3188, co-authored with **B.D. Tapley** and M. Parke.
29. "An Empirical Determination of the Effects of Sea State Bias on Seasat Altimetry," *Journal of Geophysical Research*, Vol. 87, No. C5, April 30, 1982, pp. 3221-3226, co-authored with M. Richards and G.W. Rosborough.
30. "Seasat Measurement System Evaluation: Achievements and Limitations," *Journal of Geophysical Research*, Vol. 87, No. C5, April 30, 1982, pp. 3175-3178, co-authored with D. Lame.

31. "Seasat Altimeter Determination of Ocean Dynamic Height: A Kuroshio Verification Experiment," *Journal of Geophysical Research*, Vol. 87, No. C5, April 30, 1982, pp. 1625-1636, co-authored with **R.L. Bernstein** and R.H. Whritner.
32. "The Seasat Altimeter Wet Tropospheric Range Correction," *Journal of Geophysical Research*, Vol. 87, No. C5, April 30, 1982, pp 3213-3220, co-authored with **B.D. Tapley** and J.R. Lundberg.
33. "Collinear-Track Altimetry in the Gulf of Mexico from Seasat: Measurements, Models and Surface Truth," *Journal of Geophysical Research*, Vol. 88, No. C3, February 28, 1983, pp. 1625-1636, co-authored with **J.D. Thompson** and G.A. Maul.
34. "A Survey of Oceanographic Satellite Altimetric Missions," *Marine Geodesy*, Vol. 8, No. 1-4, 1984, pp 3-16, co-authored with D.B. Lame and J.L. Mitchell.
35. "The Seasat Altimeter Wet Tropospheric Range Correction Revisited," *Marine Geodesy*, Vol. 8, No. 1-4, 1984, pp 221-248, co-authored with J.B. Lundberg and B.D. Tapley.
36. "The TOPEX Mission -- Observing the Oceans from Space," *EOS Transactions, American Geophysical Union*, Vol. 65, No. 28, July 10, 1984, pp. 434-443, co-authored with C. Wunsch and C. Yamarone.
37. "TOPEX -- A Spacebourne Ocean Observing System," *AIAA Progress in Aeronautics and Astronautics Series, Monitoring Earth's Oceans, Land and Atmosphere from Space-Sensors, Systems and Applications*, Vol. 97, 1985, co-authored with R.W. Stewart and C. Yamarone.
38. "Orbit Determination Using Dual Crossing Arc Altimetry," *ACTA Astronautica*, Vol. 13, No. 4, 1986, co-authored with **M. Santee** and B. Tapley.
39. "Accurate Measurement of Mean Sea Level Changes by Altimetric Satellites," *Journal of Geophysical Research*, Oct. 1986, Vol. 97, No. C10, pp 11775-11782, co-authored with B. Tapley, J. Ries, and R. Stewart.
40. "The GEOSAT-ERM Mission Design," *The Journal of Astronautical Sciences*, Vol. 35, No. 2, April-June, 1987, pp 119-134, co-authored with J. Mitchell and G. Heyler.
41. "GEOSAT-ERM Orbit Determination," *American Astronautical Society, Advances in the Astronautical Sciences*, Vol. 65, 1988, pp 65-81, co-authored with F.G. Lemoine and M.J. Crawford.
42. "Orbit Analysis for the GEOSAT-ERM," 1988, *The Journal of the Astronautical Sciences*, Vol. 36, No. 4, October-December 1988, pp 425-446, co-authored with P. Allen and N. Pino.

43. "Satellite Derived Water Vapor Corrections for GEOSAT Altimetry," Journal of Geophysical Research, March 15, 1990, Vol. 95, No. C3, pp 2953-2964, co-authored with W. J. Emery, D. G. Baldwin and C. L. Norris.
44. "Precise Orbit Computation for the GEOSAT Exact Repeat Mission," Journal of Geophysical Research, March 15, 1990, Vol. 95, No. C3, pp 2871-2886, co-authored with B. Haines, J. Marsh, and R. Williamson.
45. "Mean Sea Surface and Variability of the Gulf of Mexico Using GEOSAT Altimetry Data," Journal of Geophysical Research, March 15, 1990, Vol. 95, No. C3, pp 3025-3032, co-authored with , **R. Leben**, and C. Fox.
46. "Measuring Precise Sea Level From A Buoy Using The Global Positioning System," Geophysical Research Letters, Nov. 1990, Vol. 17, No. 12, pp 2145-2148, co-authored with **T. Kelecy**, C. Rocken, L. Young, G. Purcell, and S. Wolf.
47. "Optimal Temperature Estimation for Modeling the Thermal Elastic Shock Disturbance Torque," Journal of Spacecraft and Rockets, July-Aug 1991, Vol. 28, No. 4, pp 448-456, co-authored with **D. F. Zimbelman** and R. V. Welch.
48. "Time, Frequency and Space Geodesy: Impact on the Study of Climate and Global Change," invited paper Proceedings of the IEEE, July 1991, Vol. 79, No. 7, co-authored with **P. MacDoran**.
49. "GPS Positioning Opportunities for WOCE," Proceedings of the International Symposium on Marine Positioning, PIP Printing, Rockville MD 1991, co-authored with **P. F. MacDoran**, R. G. Bilham, T. M. Kelecy, and C. Rocken.
50. "Precise Sea Level Measurement Experiment Using a GPS Equipped Buoy," Proceedings of the International Symposium on Marine Positioning, PIP Printing, Rockville MD, 1991, co-authored with **T. M. Kelecy**, C. Rocken, and L. E. Young.
51. "The Global Structure of the Annual and Semi-annual Sea Surface Height Variability from GEOSAT Data", Journal of Geophysical Research, Nov 15, 1992, Vol. 97, No. C11, pp 17813-17828, co-authored with **G. A. Jacobs**, M. E. Parke, and P. C. Allen.
52. "The Application of Kinematic GPS to Precise Sea Level Measurements", Proceedings of the Sixth International Geodetic Symposium on Satellite Positioning, Defense Mapping Agency and Ohio State University, March 1992, pp 1039-1048, co-authored with **T. M. Kelecy** and G. L. Madler.
53. "GPS Buoy and Pressure Transducer Results from the August 1990 Texaco Harvest Oil Platform Experiment," Marine Geodesy, 1992, Vol. 15, No. 4, co-authored with **T. Kelecy** and C. Rocken.

54. "An Estimate of Decadal Changes in Sea Surface Topography from Seasat and Geosat Altimetry", Sea-Level Changes: Determination and Effects, American Geophysical Union Monograph No. 69, 1992, pp 181-187, co-authored with **B. Haines** and C. Koblinsky.
55. "A Study of Real-Time GPS Orbit Determination for the Extreme Ultraviolet Explorer", Proceedings of the Institute of Navigation National Technical Meeting., San Diego CA, Jan. 1993, co-authored with **K. Gold**, W. Bertiger, S. Wu, T. Yunck, R. Muellerschoen, and K. Larson.
56. "Rossby Waves in the Pacific Extracted from GEOSAT Altimeter Data," The Journal of Physical Oceanography, June 1993, Vol. 23, No. 6, pp 1155-1175, co-authored with **G. A. Jacobs**, and W. J. Emery.
57. "Variability in the Gulf of Alaska from Geosat Altimetry Data," JGR Oceans, Sept 15, 1993, Vol. 98, No. C9, pp 16311-16330, co-authored with **S. Bhaskaran**, G. Lagerloef, and W. Emery.
57. "Tracking Loop Current Eddies with Satellite Altimetry", Advances in Space Research, Vol. 13, no.11, Nov 1993, pp 325-333, co-authored with **R. Leben**.
59. "Application of GEM-T2 Gravity Field to Geosat Orbit Computation, JGR Oceans, Aug 15, 1994, Vol. 99, No. C8, pp 16,237 - 16,254, co-authored with **B. J. Haines**, C. J. Koblinsky and R. G. Williamson.
60. "Precise Mean Sea Level Measurements Using the Global Positioning System", JGR Oceans, April 15, 1994, Vol. 99, No. C4, pp 7951-7959, co-authored with **T. Kelecy**, M. Parke, and C. Rocken.
61. "TOPEX/POSEIDON Near Real Time Altimetry in the North Indian Ocean", WOCE Notes, Aug 1994, Vol. 6 No. 2, pp 9-14, co-authored with **L. Kantha**, D. Beitzell, S. Harper, and J. Kindle.
62. "The Use of GPS Buoys to Calibrate Altimetric Satellites", Proceedings of the ION GPS-94, 7th International Technical Meeting of the Satellite Division of the Institute of Navigation, Salt Lake City, Utah, September 20-23, 1994, pp 221-230, co-authored with **M. Parke**, P. Axelrad, K. Gold, K. Key, D. Kubitschek.
63. "Calibration of the TOPEX/POSEIDON Altimeter Using a GPS buoy", JGR Oceans, December 15, 1994, Vol. 99, No. C12, pp 24,517-24,526, co-authored with **M. Parke**, P. Axelrad, K. Gold, J. Johnson, K. Key, and D. Kubitschek.
64. "Calibration of TOPEX/POSEIDON at Platform Harvest", JGR Oceans, December 15, 1994, Vol. 99, No. C12, pp 24,465-24,485, co-authored with **E. Christensen**, B. Haines, C. Morris and M. Parke et al.

65. "GPS Orbit Determination for the Extreme Ultraviolet Explorer", Journal of the Institute of Navigation, Vol. 41, No. 3, Fall, 1994, pp 337 - 351, co-authored with **K. Gold**, W. Bertiger, S. Wu, T. Yunck, and R. Muellerschoen.
66. "CU Sea Level System at Platform Harvest", Marine Geodesy, Vol 18, No. 1-2, January-June 1995, co-authored with **D. Kubitschek**, M. Parke, J. Johnson and C. McLaughlin.
67. "Precision Orbit Determination in the Geosat Orbit", Proceedings of the Institute of Navigation National Technical Meeting, Anaheim CA, Jan. 18-20, 1995, co-authored with **K. Gold**, K. Irish, A. Reichert, P. Binning, and P. Axelrad.
68. "EOF Analysis of Global TOPEX/Poseidon Altimeter Data and Implications for Detection of Global Sea Level Rise", JGR Oceans, Vol. 101, No. C6, pp 14,131-14,145, June 15, 1996, co-authored with **J. Hendricks**, R. Leben, and C. Koblinsky.
69. "A new Class of Adaptive, Extended Kalman Filter", Spaceflight Mechanics; Advances in the Astronautical Sciences, Vol. 93 part 1, pp 117-135, AAS Publication Office, San Diego, 1996, co-authored with **D. Cruickshank**.
70. "Precision Orbit Determination for GFO and GFO-2", Spaceflight Mechanics; Advances in the Astronautical Sciences, Vol. 93 part 1, pp 1331-1342, AAS Publication Office, San Diego, 1996, co-authored with **K. Irish**, K. Gold, and P. Axelrad.
71. "Detection of ocean waves using satellite Altimetry: Application to Kelvin Waves", Marine Geodesy, Vol. 19, No. 4, 1996, co-authored with **B. Dayyani**, and P. D. Weidman.
72. "Real-Time Outreach at the University of Colorado", Currents, Issue 15, pp 1-5, July 1997.
73. "Correction of Single Frequency Altimeter Measurements for Ionosphere Delay", IEEE Transactions on Geoscience and Remote Sensing, Vol. 35, No.2, March 1997, pp , co-authored with **W. Schreiner** and R. Markin.
74. "Mapping the Sea Surface Using a GPS Buoy", Marine Geodesy, Vol. 21, No. 1, 1998, co-authored with **M. Parke** and K. Key.
75. "Seasonal Analysis of TOPEX/POSEIDON Altimeter Data Corrections", Marine Geodesy, Vol. 21, No. 1, 1998, co-authored with **J. Myrick** and M. Parke.
76. "Altimeter Sampling Characteristics Using a Single Satellite", JGR Oceans, Vol. 103, No. C5, pp 10,513-10,526, May 15, 1998, co- authored with **M. Parke**, R. Leben, and C. Tierney.
77. "Precision Orbit Determination for the Geosat Follow-On Satellites", Journal of Spacecraft and Rockets, Vol. 35, No. 3, pp 336-341, May-June 1998, co-authored with **K. Irish**, K. Gold, A Reichert, and P. Axelrad.

78. "An investigation of ocean tides derived from along track altimetry", JGR Oceans, Vol. 103, No. C5, pp 10,273-10,287, May 15, 1998, co-authored with **C. Tierney**, and M. Parke.
79. "Analysis of Legeckis Eddies in the near equatorial Pacific", JGR Oceans, Vol. 104, No. C4, April 15, 1999, pp 7865-7888, co-authored with **P. Weidman**, D. Mickler, and B Dayyani.
80. "A new GPS data processing algorithm for the positioning of oceanographic experiments", Journal of Atmospheric and Oceanic Technology, Vol. 16, No. 8, Aug 1999, pp 1127-1137, co-authored with **K. Key**, K. Leaman, P. Vertes.
81. "GPS-based ionospheric corrections for single frequency radar altimetry", J. of Atmospheric and Solar-Terrestrial Physics, Vol. 61, 1999, pp 1197-1203, co-authored with **A. Komjathy**.
82. "GPS Signal Scattering from Sea Surface: Comparison Between Experimental Data and Theoretical Model," *Remote Sensing of Environment*, Vol. 73, 2000, pp 162-174 co-authored with **A. Komjathy**, V. Zavorotny, P. Axelrad, and J. Garrison.
83. "Shallow and Deep Water Tides from Altimetry and Numerical Modeling", J. Geophysical Research, Vol. 105, No. C5, May 15, 2000, pp 11259-11278, co-authored with **C. Tierney** and L. Kantha.
84. "Gulf of Mexico Ocean Monitoring System", Oceanography, vol. 13, No. 2, 2001, co-authored with **J. Blaha**, R. Leben, et al.
85. "Modeling the Anomalous Acceleration and Radiation Pressure Forces for the TOPEX/Poseidon Spacecraft", Philosophical Transactions A of the Royal Society, Vol 359, 2001, pp 2191 – 2208, co-authored with **D. Kubitschek**.
86. "An Analytical Theory for Orbit Determination", Journal of the Astronautical Sciences, Vol. 49, No.2, April-June 2001 co-authored with **D. Goldstein** and B. Thompson.
87. "Real-time, Autonomous, Precise Orbit Determination Using GPS", Navigation, Fall 2001, Vol. 48, No. 3, pp 169–179, co-authored with **D. Goldstein** and P. Axelrad.
88. "Operational Altimeter data processing for mesoscale monitoring", Marine Geodesy, Vol. 25, No. 1-2, January-June, 2002, pp 3-18, co-authored with **R. Leben**, and B. Engebretth.
89. "Orbit Determination for the Quikscat Spacecraft", Spacecraft and Rockets Nov-Dec, 2002, vol. 39, no. 6, pp. 852-858 co-authored with **B. Thompson**, M. Meek, D. Kubitschek, K. Gold, and P. Axelrad.
90. "Leveling Sea Surface using a GPS-Catamaran", Marine Geodesy, Vol. 26, No. 3-4, July-Dec, 2003, coauthored with **P Bonnefond**, et al.

91. “The Harvest Experiment: Monitoring Jason-1 and TOPEX/Poseidon from a California Offshore Platform”, Marine Geodesy, Vol. 26, No. 3-4, July-Dec, 2003, co-authored with **B. Haines**, D. Dong, and S. Gill.

92. “Using GPS Signals for Satellite Remote Sensing”, Acta Astronautica, Vol. 55, 2004, pp. 39-49, co-authored with **D. Mickler** and P. Axelrad.

93. “Orbit Determination Strategy Using Single Frequency GPS Data” Journal of Spacecraft and Rockets, Vol. 42, No. 5, Sept.-Oct 2005, co-authored with **Y. Hwang**.

94. “Automated Operational Orbit Determination for the ICESat Mission”, Journal of Spacecraft and Rockets, Vol. 43, No. 5, Sept-Oct, 2006, co-authored with **C. Meek** and P. Axelrad.

95. “Near Real-Time Satellite Altimeter Products: Pacific Ocean Tools and Applications” Pacon publications, 2005, co-authored with **R. Leben**.

96. “Autonomous Interplanetary Orbit Determination using Satellite-to Satellite Tracking”, Journal of Guidance, Control, and Dynamics, Vol. 30, No. 3, May-June 2007, pp 679-686 co-authored with **K. Hill**.

97. “Autonomous Orbit Determination from Lunar Halo Orbits Using Crosslink Range”, Journal of Spacecraft and Rockets, Vol 45, No. 3, May- June, 2008, Co-authored with **Keric Hill**.

98. ”Mars Aerobraking Spacecraft State Estimation by Processing Inertial Measurement Unit Data”, Journal of Guidance, Control, and Dynamics, Vol. 31, No. 6, Nov-Dec 2008, co-authored with **M. Jah**, M. Lisano, and P. Axelrad.

99. “Direct Lunar Halo Orbit Transfers” Journal of the Astronautical Sciences, Vol 56, No. 4, Oct-Dec, 2008, Co-authored with **Jeffrey Parker**.

100. “Modeling a Low Energy Ballistic Lunar Transfer Using Dynamical Systems Theory”, Volume 45, Number 6 (Nov./Dec. 2008) AIAA Journal of Spacecraft and Rockets, Co-authored with **Jeffrey Parker**.

- 101 “Mission Design Options for the DUNE Spacecraft”, Journal of the Astronautical Sciences, Vol. 56, No. 3, July-September 2008, Co-authored with **Jeffrey Parker**.

- 102 “Sensitivity of Orbit Predictions to Density Variability”, Journal of Spacecraft and Rockets, Vol. 46, No. 6, Nov-Dec, 2009, Co-authored with **Rodney Anderson** and Jeffrey Forbes.

103. “Chaining Periodic Three-Body Orbits in the Earth-Moon System”, *Acta Astronautica* Vol. 67, 2010, pp. 623-638 Co-authored with **Jeffrey Parker** and Kathryn Davis.
104. “A Cubed Sphere Gravity Model for Fast Orbit Propagation”, *Journal of Guidance, Control, and Dynamics*, Vol.33, No. 2, Mar/Apr. 2010, Co-authored with **Brandon A. Jones** and Gregory Beylkin.
105. “The Harvest Experiment: Calibration of the Climate Data Record from TOPEX/Poseidon, Jason-1 and OSTM/Jason-2”, *Marine Geodesy*, Vol. 33, Supplement 1, 2010, Co-authored with **B. J. Haines** and S. D. Desai.
106. “Preliminary Study of Geosynchronous Orbit Transfers from LEO using Invariant Manifolds, *The Journal of Astronautical Sciences*, Vol. 58, No. 8, Part 1, July – September 2011, pp. 295-310, Co-authored with **Kate Davis** and Rodney Anderson.
107. “The Harvest Experiment LIDAR System: Water Level Measurement Device Comparison for Jason-1 and Jason-2/OSTM Calibration”, *Marine Geodesy*, vol 34, No 3-4, July-Dec 2011, Co-authored with **S. Washburn**, B. Haines and C. Fowler.
108. “Optimal transfers between unstable periodic orbits using invariant manifolds *Celestial Mechanics and Dynamical Astronomy: Volume 109, Issue 3, Page 241*, 2011, Co-authored with **K. Davis**, D. Scheeres, and R. Anderson.
109. “A Multiresolution Model for Small-Body Gravity Estimation,” *Celestial Mechanics and Dynamical Astronomy*, Vol. 111, Number 3, pp. 309-335, 2011, Co-authored with **Jones, B. A.** , G. Belykin, R. S. Provence.
110. “Sequential Orbit Determination with the Cubed-Sphere Gravity Model,” *Journal of Spacecraft and Rockets*, Vol. 49, Number 1, pp. 145-156, 2012, Co-authored with **Jones, B. A.** and G. Beylkin
111. “Impact of Tidal Density Variability on Orbital and Reentry Predictions,” *Space Weather*, Vol. 10, S12003, 2012, Co-authored with **Leonard, J. M.** and J. Forbes.
112. “Gravity Error Compensation Using Second-Order Gauss-Markov Processes,” *Journal of Spacecraft and Rockets*, Vol 50, No. 1, Jan-Feb, 2013, Co-authored with **J. M. Leonard**, and Nievinski, F. G.
113. “Nonlinear Propagation of Orbit Uncertainty Using Non-Intrusive Polynomial Chaos” the *AIAA Journal of Guidance, Control and Dynamics*, Vol 36, No 2, pp 415 - 425, 2013, Co-authored with **A. Doostan** and B. Jones.

Books

Statistical Orbit Determination, co-authored with B. Tapley and B. Schutz of The University of Texas at Austin, Elsevier/Academic Press, 2004.

Book Chapters

Satellite Orbit Determination, *The Encyclopedia of Aerospace Engineering*, John Wiley & Sons Ltd, publisher, (2010), pp 3085-3100, Co-authored with Brandon A. Jones.

Guest Editor of Journal Special Issues

1. Guest Editor, Special Issue on Seasat Ephemeris Analysis, *Journal of the Astronautical Sciences*, Vol. XXVII, No. 4, Oct-Dec 1980.
2. Guest Editor, Seasat Special Issue II, *Journal of Geophysical Research*, Vol. 88, No. C3, Feb 28, 1983.
3. Guest Editor, Special Issue on Satellite Altimetry, *Marine Geodesy*, Vol. 8, No. 1-4, April 1984.
4. Guest Editor, Special Issue on TOPEX/Poseidon Calibration and Validation, *Marine Geodesy*, Vol. 18, No. 1-2, January - June 1995.
5. Guest Editor, Special Issue on Jason-1 Calibration and Validation (part 1), *Marine Geodesy*, Vol. 26, No. 3-4, July-Dec, 2003.
6. Guest Editor, Special Issue on Jason-1 Calibration and Validation (part 2), *Marine Geodesy*, Vol. 27, No. 1, 2, Jan-June, 2004.
7. Guest Editor, Special Issue on Jason-1 Calibration and Validation (part 3), *Marine Geodesy*, Vol. 27, No. 3, 4, July-Dec, 2004
8. Guest Editor, Special Issue of the *Journal of the Astronautical Sciences*. Papers presented at symposium honoring Byron Tapley, Austin, TX, Feb 1, 2008.
9. Guest Editor, *Marine Geodesy*, Three Special Issues on OSTM/Jason-1 and 2 Calibration/Validation, *Science and Operational Oceanography Results*, *Marine Geodesy*, Issue #1, Vol 33, 2010; Issue #2 Vol 34, No 3-4, July-Dec, 2011; Issue #3 , Vol. 35, Supplement 1, July-Dec 2012.

Scientific and professional societies of which a member:

American Institute of Aeronautics and Astronautics, Fellow; American Astronautical Society, Fellow; Institute of Navigation; American Geophysical Union; American Meteorology Society; American Society of Engineering Educators; American Association for the Advancement of Science; The Oceanographic Society; Sigma Gamma Tau; Tau Beta Pi.

Honors and Awards:

Member National Academy of Engineering (2004)

Distinguished Engineering Alumni Award, University of Colorado, Boulder, 2013 (for service to the Engineering College)

Big 12 Fellowship from the Vice Chancellor's Awards and Grants Advisory Committee (2002)

American Institute of Aeronautics and Astronautics, Mechanics and Control of Flight Award (1999)

American Astronautical Society, Dirk Brouwer Award (1998)

Research Award, University of Colorado, College of Engineering (1994)

NASA Exceptional Service Medal, Seasat Geophysical Evaluation Management, 1980

NASA Public Service Medal, TOPEX/Poseidon Mission Support, 1994

Eight NASA Group Achievement Awards (1970-2004)

Fellow, American Institute of Aeronautics and Astronautics (1991)

Fellow, American Astronautical Society (1990)

Professional Activities:

Current:

Member – OSTM Science Team (NASA)

Member - Jason-2 Science Team: (NASA)

Former:

Chair and Vice Chair NAE Aerospace Peer Committee

Member NAE Committee on Membership

Member NAE Nomination Committee

Associate Editor - Journal of Marine Geodesy

Member – TOPEX/Poseidon Precision Orbit Determination Team (NASA)

Member – TOPEX/Poseidon Science Team (NASA)

Member - Committee on Earth Studies, Space Studies Board, National Academy of Sciences

Member - Eos Global Positioning System Team: (NASA)

Member - Committee to Review the NASA Graduate Student Researcher Program: (NASA)

Member Underrepresented Minority and Disabled Focus Committee: (NASA)

Member - NASA/Navy Altimeter Study Group

Member - IAG Subcommittee of the US National Committee of the IUGG

Astrodynamics Editor - The Journal of the Astronautical Sciences

Member - AIAA Astrodynamics Committee

Member - Satellite Ocean Data System Science Working Group: (NASA)

Member - Seasat Altimeter Experiment Team: (NASA)

Member - Seasat Science Steering Group: (NASA)

Member - Mariner 9 Celestial Mechanics Team: (NASA)

Member - Phobos Experiment Team (Viking Mission to Mars, NASA)

Supervising Professor for Ph. D graduates of the University of Colorado and dissertation titles:

1. Darrel Zimbelman (1990): Thermal Elastic Shock and Its Effect on Spacecraft Attitude Control.
2. Patrick Allen (1990): An Altimetric Study on the Branching of the Gulf Stream System into the North Atlantic and Azores Currents.
3. Kuang-Chung Tu (1990): Precise Real-Time Orbit Determination for Applications to GPS Differential Positioning.
4. Bruce Haines (1991): Evaluation of SEASAT/GEOSAT Altimetry with Application to Long-Term Sea Level Changes in the North Pacific.
5. Gregg Jacobs (1991): An Analysis of Rossby Waves in the Pacific Ocean from GEOSAT Altimetry.
6. Thomas Kelecy (1991): Application of Precise Orbit Determination and Astrodynamics to Satellite Altimetry and Satellite Geodesy.
7. Shyam Bhaskaran (1991): Application of Satellite Altimetry to Study the Gulf of Alaska Gyre.
8. William Schreiner (1993): Error Analysis of Real-Time and Post-Processed Orbit Determination for the GEOSAT Follow-On Altimetric Satellite Using GPS Tracking.
9. Ramesh Govind (1994): Absolute Sea Level Monitoring in Australia: The Geodetic Fixing of Tide Gauge Benchmarks using the Global Positioning System.
10. James LaMance (1994): Evaluation of Global Sea Surface Height Estimates from Combined ERS-1 and TOPEX Altimetry.
11. John Rodell (1994): A Study of the Impact of Enhanced Non-Conservative Force Models for Spot-2 on Gravitational Model Estimation.
12. Kenneth Gold (1994): GPS Applications to EUVE Precise Orbit Determination.
13. Denis Trembley (co-chair, 1995): Simultaneous Estimation of the Orbit Error, the Geoid, the Dynamic Topography, and the Oceanic Tides from Geosat Data.
14. Theodore Olson (1996): Geopotential Improvement from Explorer Platform Single-Frequency GPS Tracking.
15. Douglas Engelhardt (co-chair, 1996): Estimation of North Pacific Ocean Dynamics and Heat Transport from TOPEX/Poseidon Satellite Altimetry and A Primitive Equation Ocean Model.
16. James Hendricks (co-chair, 1996): Global Sea Level Rise and Upper Ocean Heat Storage Estimates from TOPEX/Poseidon Satellite Altimetry.

17. Jennifer Myrick (1996): Improvement of Environmental Correction Models for Satellite Altimetry Using Empirical Analysis.
18. Kelly Irish (1996): Precision Orbit Determination for the GEOSAT Follow-On Satellites Using GPS.
19. Patrick Binning (1997): GPS Absolute and Relative Satellite Navigation.
20. Daniel Kubitschek (1997): The Anomalous Acceleration and Radiation Force Calculation for the TOPEX/Poseidon Spacecraft.
21. Kevin Key (1997): Use of a GPS Equipped Buoy for Precision Sea Level Measurement.
22. David Curickshank (1998): Genetic Model Compensation: Theory and Applications.
23. Craig McLaughlin (1998): Autonomous Orbit Determination and its Effects on Geolocation
24. Craig Tierney (co-chair, 1998): Global Estimation of Ocean Tides in Deep and Shallow Water from TOPEX/Poseidon and Numerical Models with Applications to Geophysics, Oceanography, and Precision Altimetry.
25. David Goldstein (2000): Real-Time Autonomous Precise Satellite Orbit Determination Using the Global Positioning System.
26. Suzanna Barth (co-chair, 2002): Estimating Real-Time Ocean Temperature Profiles from Satellite Altimetry for Use in a Coupled Model of Hurricane Intensification.
27. Clifton Minter (2002): Thermospheric Composition Forecasting Using Kalman Filtering Techniques.
28. Yoola Hwang (2003): Orbit Determination Strategy Using Single Frequency GPS Data.
29. Matthew C. Meek (2004): Automated Operational Orbit Determination.
30. Moriba Jah (2005): Mars Aerobraking Spacecraft State Estimation by Processing IMU data.
31. Rodney Anderson (2005); Low Thrust Trajectory Design for Resonant Flybys and Captures Using Invariant Manifolds.
32. Keric Hill (2007): Autonomous Navigation in Libration Point Orbits.
33. Jeffrey Parker (2007): Low Energy Ballistic Lunar Transfers.
34. Kate Hamera Davis (2009): Locally Optimal Transfer Trajectories Between Libration Point Orbits Using Invariant Manifolds.

35. Brandon Jones (2010): Efficient Models for the Evaluation and Estimation of the Gravity Field.

36. Aurora Sibois (2011): GPS-based Sub-Hourly Polar Motion Estimates: Strategies and Applications

37. Scott Washburn (2012): Radiation Shielding for Deep Space Missions.

Current Ph. D. Candidates:

1. Bradley Cheetham
2. Eduardo Villaba
3. Brian Lathrop (Co-Chair)
4. Ann Detrich (Co-Chair)
5. Jason Leonard
6. Jon Herman (Co-Chair)
7. Nicholas Ravago
8. Bena Mero

Post Doctoral

Katherine Davis