

R. STEVEN NEREM CURRICULUM VITAE

EDUCATION

The University of Texas at Austin	Aerospace Engineering	Ph.D.	1989
Dissertation: <i>Determination of the General Ocean Circulation Using Satellite Altimetry from a Simultaneous Solution for the Earth's Gravity Field</i> , Advisor: Byron D. Tapley			
The University of Texas at Austin	Aerospace Engineering	M.S.	1985
Thesis: <i>The Use of Satellite Altimeter Data for Determining the Mean Sea Surface</i> , Advisors: Byron D. Tapley and George H. Born			
Colorado State University	Geology	B.S.	1982

ACADEMIC APPOINTMENTS

Professor, Dept. of Aerospace Engineering Sciences, University of Colorado at Boulder, August 2000 – present.

Associate Professor, Dept. of Aerospace Engineering Sciences, University of Colorado at Boulder, August 2000 – 2005.

Associate Director, Colorado Center for Astrodynamics Research, University of Colorado at Boulder, January 2002 – present.

Associate Professor, Dept. of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin, September 1999 – August 2000.

Assistant Professor, Dept. of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin, January 1996 – August 1999.

OTHER PROFESSIONAL EXPERIENCE

Visiting Scientist, Groupe de Recherches en Géodésie Spatiale, Centre National d'Etudes Spatiale, Toulouse, France, March – August, 2002

Geophysicist, Space Geodesy Branch, Laboratory for Terrestrial Physics, NASA Goddard Space Flight Center, Greenbelt, MD, May 1990 - January 1996.

Member of Technical Staff, Pilot Ocean Data System, Jet Propulsion Laboratory, Pasadena, CA, May 1985 - Aug. 1985.

Physical Scientist, National Oceanic and Atmospheric Administration, assigned to the Center for Space Research, The University of Texas at Austin, Sept. 1982 - Dec. 1984.

Research Assistant, National Oceanic and Atmospheric Administration, assigned to NASA Johnson Space Center, June 1982 - Aug. 1982

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

Member, American Geophysical Union, 1982-present.

Member, International Union of Geodesy and Geophysics, 1987-present.

Member, International Association of Geodesy, 1989-present.

Member, American Institute of Aeronautics and Astronautics, 1990-present.

Member, European Geophysical Union, 1991-present.
Member, American Society of Engineering Education, 1997-present
Member, Institute of Electrical and Electronics Engineers, 1998-present

PROFESSIONAL SOCIETY AND MAJOR GOVERNMENTAL COMMITTEES, EDITORIAL BOARDS, AND CONFERENCES CHAIRED

Member, TOPEX Precision Orbit Determination Team, 1989-present.
Member, TOPEX Gravity Model Improvement Team, 1989-96.
Member, International Association of Geodesy Special Study Group 2.107, Gravity Field Determination by Satellite Gravity Gradiometry, 1991-95.
Member, International Association of Geodesy Special Study Group 2.132, Time-Varying Gravitational Effects on Satellite Orbits, 1991-95.
Member, International Association of Geodesy Special Study Group 2.151, Altimetry: Optimal Processing for Geodesy, Geophysics, and Oceanography, 1991-95.
Member (corresponding), International Association of Geodesy Special Study Group 2.130, Non-Gravitational Force Modeling Effects on Satellite Orbits, 1991-95.
Member, NOAA Climate and Global Change Program Proposal Review Panel, 1992.
Session Chairman, Planetary Geodesy, American Geophysical Union Spring Meeting, 1992.
Session Chairman, Satellite Altimetry, American Geophysical Union Fall Meeting, 1992.
Member, NASA/GSFC Source Evaluation Board (SEB), Geodynamics Contract, 1993.
Geodesy Section Program Chairman, American Geophysical Union Spring Meeting, 1993.
Session Chairman, Geodesy at the Crossroads, American Geophysical Union Spring Meeting, 1993.
Session Chairman, Ocean Topography and Circulation, American Geophysical Union Fall Meeting, 1993
Member, NASA Proposal Review Panel, Near Earth Asteroid Rendezvous (NEAR) Mission Facility Instrument Team, 1994.
Geodesy Section Program Chairman, American Geophysical Union Spring Meeting, 1994.
Session Chairman, Applications of Geodesy to Monitoring Global Change, American Geophysical Union Spring Meeting, 1994.
Member, AIAA Committee on Astrodynamics Standards, 1992-present.
Member, TOPEX SWT Subcommittee on Intercomparison and Merging of Geodetic Data, 1990-93.
Member, EOS Precision Orbit Determination/Mission Design Panel, 1990-92.
Member, Geodesy Section Executive Committee, American Geophysical Union, 1994-present.
Member, IAG Special Study Group 4.168, Inversion of Satellite Altimetry, 1995-99.
Member, IAG Special Study Group 3.165, Global Gravity Field Determination and Evaluation, 1995-99.
Geodesy Section Press Officer, American Geophysical Union Spring Meeting, 1995.
Session Chairman, Global Sea Level Change, American Geophysical Union Spring Meeting, 1995.
Session Chairman, Satellite Altimetry, American Geophysical Union Fall Meeting, 1995.
Session Co-convenor, International Union of Geodesy and Geophysics/International Association of Geodesy General Assembly, 1995.
Session Chairman, European Geophysical Society, 1996.
Session Chairman, Planetary Geodesy, American Geophysical Union Fall Meeting, 1996.

Member, NASA Planetary Science Data Steering Group (PSDSG), 1995-96.
 Session Chair, IGS/PSMSL Sea Level Workshop, 1997
 Group Leader for Calibration/Validation, Jason Science Team Meeting, Baltimore, May, 1997.
 U. S. Representative, International Geoid Service, International Association of Geodesy
 Session Chair, Geodesy, American Geophysical Union Fall Meeting, December 1998.
 Session Chair, Geodesy, American Geophysical Union Spring Meeting, May 1999.
 Session Chair, Geodesy, American Geophysical Union Fall Meeting, December 2000.
 Member, IAG/IAPSO Joint Working Group on Geodetic Effects of Nontidal Oceanic Processes,
 1999-2003
 Session Chair, Geodesy, American Geophysical Union Fall Meeting, December 2003.
 Editor, Geodesy Section, *Eos Transactions*, 1999-2002.
 Associate Editor, *Journal of Geophysical Research - Solid Earth*, 1995-1998.
 Secretary, Geodesy Section, American Geophysical Union, 2002-2004

UNIVERSITY COMMITTEES/ADMINISTRATIVE ASSIGNMENTS

The University of Texas at Austin

Member, Graduate Studies Committee, 1996-97
 Member, ASE/EM Computer Committee, 1997-98
 Member, ASE/EM ABET Metrics Committee, 1997
 Chair, Orbital Mechanics Ph.D. Qualifying Exam Committee, 1997
 ASE/EM Graduate Area Coordinator (Orbital Mechanics), 1998-present
 Engineering Honors Program Committee, 1998-present
 Member, Center for Space Research Review Committee, College of Engineering, 1999

University of Colorado

Member, AES Graduate Curriculum Committee, 2003-present
 Member, Adhoc Committee on AES/LASP Cooperation, 2002-2004
 Member, AES Graduate Committee on Recruitment, 2004-present
 Member, AES Evaluation/Salary Committee, 2003-2004
 Chair, AES Faculty Search Committee, 2003-2004
 Member, Geophysics Program Steering Committee, 2002-present
 Fellow, Cooperative Institute for Research in Environmental Sciences, 2003-present

HONORS AND AWARDS

M. J. Thompson Presidential Graduate Endowed Fellowship in Aerospace Engineering, The
 University of Texas at Austin, 1987-88.
 NASA/Goddard Space Flight Center Outstanding Performance/Quality Increase Award, 1991.
 NASA/Goddard Space Flight Center Performance Award, 1992.
 NASA Group Achievement Award (Goddard Earth Model GEM-T3), 1992.
 Editors' Citation for Excellence in Refereeing for Geophysical Research Letters, 1993.
 NASA/GSFC Certificate of Outstanding Performance, 1993.
 NASA/Goddard Space Flight Center Quality Increase Award, 1993.
 NASA/GSFC Special Act Group Award, Lageos II Project Team, 1993.
 NASA Group Achievement Award (TOPEX/Poseidon Mission Design), 1993.

NASA/Goddard Space Flight Center Group Achievement Award (Lageos-2 Project Team),1993.
NASA/Goddard Space Flight Center Group Achievement Award (Joint Gravity Model 1 Team),1993.
NASA/GSFC Performance Award (Outstanding), 1994
NASA/GSFC Certificate of Outstanding Performance, 1994
NASA Public Service Group Achievement Award (TOPEX/POSEIDON Precision Orbit Determination Team), 1994
NASA/Goddard Space Flight Center Group Achievement Award (TOPEX/Poseidon Precision Orbit Determination Team), 1994
NASA Exceptional Scientific Achievement Medal, 1995
Big XII Faculty Fellowship (1998-99)
1998 Faculty Excellence Awards Recipient, Halliburton Foundation Young Faculty Award
2005 Bowie Lecturer, American Geophysical Union
2006 Geodesy Section Award, American Geophysical Union

CONTINUING EDUCATION

“GIPSY/OASIS Software Users Class, Jet Propulsion Laboratory,” given at the University of Colorado, Boulder, Colorado, July 1993.
"American Society of Engineering Education (ASEE) National Effective Teaching Institute (NETI)", Washington, DC, June 20-22, 1996.
Center for Teaching Effectiveness, The University of Texas at Austin, New Faculty Workshop, August, 1996.

RESEARCH INTERESTS

Satellite altimetry, global sea level determination, Earth gravity field determination, time variations of the Earth's gravity field, planetary geodesy, precision orbit determination.

PUBLICATIONS

R. Steven Nerem

Refereed Journal Publications

1. Lundberg, J., V. Szebehely, R. S. Nerem, B. Beal, "Surfaces of Zero Velocity in the Restricted Problem of Three Bodies," *Celestial Mechanics*, Vol. 36, pp. 191-205, 1985.
2. Nerem, R. S., R. K. Holz, M. R. Helfert and B. D. Tapley, "Vegetation Change Detection from NOAA Polar Orbiting Satellites," *GeoJournal*, Vol. 11, No. 4, pp. 313-320, 1985.
3. Ludeke, A. K., R. K. Holz, P. L. Phillips and R. S. Nerem, "Seasonal/Cultural Change in Central America: an Analysis Application of NOAA-AVHRR Imagery," *Revista Geografica*, No. 103, June, 1986.
4. Tapley, B. D., R. S. Nerem, C. K. Shum, J. C. Ries, and D. N. Yuan, "Determination of the General Circulation of the Oceans from a Joint Gravity Field Solution," *Geophysical Research Letters*, Vol. 15, No. 10, pp. 1109-1112, September, 1988.
5. Nerem, R. S., B. D. Tapley, and C. K. Shum, "Determination of the Ocean Circulation Using GEOSAT Altimetry," *Journal of Geophysical Research* (Geosat Special Issue I), Vol. 95, No. C3, pp. 3163-3179, March 15, 1990.
6. Shum, C. K., R. A. Werner, D. T. Sandwell, B. H. Zhang, R. S. Nerem, and B. D. Tapley, "Variations of Global Mesoscale Eddy Energy Observed From Geosat," *Journal of Geophysical Research* (Geosat Special Issue II), Vol. 95, No. C10, pp. 17865-17876, October 15, 1990.
7. Lerch, F. J., R. S. Nerem, D. S. Chinn, J. C. Chan, G. B. Patel, and S. M. Klosko, "New Error Calibration Tests for Gravity Models Using Subset Solutions with Independent Data: Applied to GEM-T3," *Geophysical Research Letters*, Vol. 20, No. 2, pp. 249-252, February 5, 1993.
8. Nerem, R. S., B. F. Chao, A. Y. Au, J. C. Chan, S. M. Klosko, N. K. Pavlis, and R. G. Williamson, "Time Variations of the Earth's Gravitational Field From Satellite Laser Ranging to LAGEOS," *Geophysical Research Letters*, Vol. 20, No. 7, pp. 595-598, April 9, 1993.
9. Nerem, R. S., B. G. Bills, and J. B. McNamee, "A High Resolution Gravity Model for Venus: GVM-1," *Geophysical Research Letters*, Vol. 20, No. 7, pp. 599-602, April 9, 1993.
10. Nerem, R. S., B. H. Putney, J. A. Marshall, F. J. Lerch, E. C. Pavlis, S. M. Klosko, S. B. Luthcke, G. B. Patel, R. G. Williamson, and N. P. Zelensky, "Expected Orbit Determination Performance for the TOPEX/Poseidon Mission," *IEEE Transactions on Geoscience and Remote Sensing*, Vol. 31, No. 2, pp. 333-354, March 1993.
11. Smith, D. E., F. J. Lerch, R. S. Nerem, M. T. Zuber, G. B. Patel, S. K. Fricke, and F. G. Lemoine, "An Improved Gravity Model for Mars: Goddard Mars Model-1," *Journal of Geophysical Research*, Vol. 98, No. E11, pp. 20871-20889, November 25, 1993.
12. Lerch, F. J., R. S. Nerem, B. H. Putney, T. L. Felsentreger, B. V. Sanchez, S. M. Klosko, G. B. Patel, R. G. Williamson, D. S. Chinn, J. C. Chan, K. E. Rachlin, N. L. Chandler, J. J. McCarthy, J. A. Marshall, S. B. Luthcke, D. E. Pavlis, J. W. Robbins, S. Kapoor, and E. C.

- Pavlis, "Geopotential Models from Satellite Tracking, Altimeter, and Surface Gravity Data: GEM-T3 and GEM-T3S," *Journal of Geophysical Research*, Vol. 99, No. B2, pp. 2815-2839, February 10, 1994.
13. Nerem, R. S., F. J. Lerch, R. G. Williamson, S. M. Klosko, J. W. Robbins, and G. B. Patel, "Gravity Model Improvement Using the DORIS Tracking System on the SPOT-2 Satellite," *Journal of Geophysical Research*, Vol. 99, No. B2, pp. 2791-2813, February 10, 1994.
 14. Christensen, E. J., B. J. Haines, K. C. McColl, and R. S. Nerem, "Observations of Geographically Correlated Orbit Errors for TOPEX/Poseidon Using the Global Positioning System," *Geophysical Research Letters*, Vol. 21, No. 19, pp. 2175-2178, September 15, 1994.
 15. Nerem, R. S., F. J. Lerch, S. M. Klosko, G. B. Patel, R. G. Williamson, and C. J. Koblinsky, "Ocean Dynamic Topography from Satellite Altimetry Based on the GEM-T3 Gravity Model," *Manuscripta Geodaetica*, Vol. 19, pp. 346-366, September, 1994.
 16. Smith, D. E., R. Kolenkiewicz, R. S. Nerem, P. J. Dunn, M. H. Torrence, J. W. Robbins, S. M. Klosko, R. G. Williamson, and E. C. Pavlis, "Contemporary Global Horizontal Crustal Motion", *Geophysical Journal International*, Vol. 119, pp. 511-520, 1994.
 17. Nerem, R. S., F. J. Lerch, J. A. Marshall, E. C. Pavlis, B. H. Putney, B. D. Tapley, R. J. Eanes, J. C. Ries, B. E. Schutz, C. K. Shum, M. M. Watkins, J. C. Chan, S. M. Klosko, S. B. Luthcke, G. B. Patel, N. K. Pavlis, R. G. Williamson, R. H. Rapp, R. Biancale, and F. Nouel, "Gravity Model Development for TOPEX/POSEIDON: Joint Gravity Models 1 and 2," *Journal of Geophysical Research*, Vol. 99, No. C12, pp. 24,421-24,447, December 15, 1994.
 18. Tapley, B. D., J. C. Ries, G. W. Davis, R. J. Eanes, B. E. Schutz, C. K. Shum, M. M. Watkins, J. A. Marshall, R. S. Nerem, B. H. Putney, S. M. Klosko, S. B. Luthcke, D. E. Pavlis, R. G. Williamson, and N. P. Zelensky, "Precision Orbit Determination for TOPEX/POSEIDON," *Journal of Geophysical Research*, Vol. 99, No. C12, pp. 24,383-24,404, December 15, 1994.
 19. Nerem, R. S., E. J. Schrama, C. J. Koblinsky, and B. D. Beckley, "A Preliminary Evaluation of Ocean Topography from the TOPEX/Poseidon Mission," *Journal of Geophysical Research*, Vol. 99, No. C12, pp. 24,656-24,583, December 15, 1994.
 20. Christensen, E. J., B. J. Haines, S. J. Keihm, C. S. Morris, R. S. Norman, G. H. Purcell, B. G. Williams, B. C. Wilson, G. H. Born, M. E. Parke, S. K. Gill, C. K. Shum, B. D. Tapley, R. Kolenkiewicz, R. S. Nerem, "Calibration of TOPEX/POSEIDON at Platform Harvest," *Journal of Geophysical Research*, Vol. 99, No. C12, pp. 24,465-24,485, December 15, 1994.
 21. Nerem, R. S., "Global Mean Sea Level Variations from TOPEX/POSEIDON Altimeter Data," *Science*, Vol. 268, pp. 708-710, May 5, 1995.
 22. Nerem, R. S., C. Jekeli, and W. M. Kaula, "Gravity Field Determination and Characteristics: Retrospective and Prospective," *Journal of Geophysical Research*, Vol. 100, No. B8, pp. 15053-15074, August 10, 1995.
 23. Nerem, R. S., "Terrestrial and Planetary Gravity Fields," *Reviews of Geophysics*, Supplement, U.S. National Report to International Union of Geodesy and Geophysics 1991-1994, pp. 469-476, July, 1995.

24. Nerem, R. S., "Measuring Global Mean Sea Level Variations Using TOPEX/POSEIDON Altimeter Data," *Journal of Geophysical Research*, Vol. 100, No. C12, pp. 25,135-25,151, December 15, 1995.
25. Bills, B. G., and R. S. Nerem, "A Harmonic Analysis of Martian Topography," *Journal of Geophysical Research*, Vol. 100, No. E12, pp. 26,317-26,326, 1995.
26. Kiefer, W. S., B. G. Bills, and R. S. Nerem, "An Inversion of Gravity and Topography for Mantle and Crustal Structure on Mars," *Journal of Geophysical Research - Planets*, Vol. 101, No. E4, pp. 9239-9252, April 15, 1996.
27. Frey, H. V., B. G. Bills, R. S. Nerem, and J. H. Roark, "The Isostatic State of Martian Topography Revisited," *Geophysical Research Letters*, Vol. 23, No. 7, pp. 721-724, April 1, 1996.
28. Tapley, B. D., M. M. Watkins, J. C. Ries, G. W. Davis, R. J. Eanes, S. R. Poole, H. J. Rim, B. E. Schutz, C. K. Shum, R. S. Nerem, F. J. Lerch, J. A. Marshall, S. M. Klosko, N. K. Pavis, and R. G. Williamson, "The JGM-3 Gravity Model," *J. Geophys. Res.*, Vol. 101, No. B12, pp. 28029-28049, 1996.
29. Nerem, R. S., K. E. Rachlin, and B. D. Beckley, "Characterization of Global Mean Sea Level Variations Observed by TOPEX/POSEIDON Using Empirical Orthogonal Functions," *Surveys in Geophysics*, Vol. 18, pp. 293-302, 1997.
30. Nerem, R. S., B. J. Haines, J. Hendricks, J. F. Minster, G. T. Mitchum, and W. B. White, "Improved determination of global mean sea level variations using TOPEX/POSEIDON altimeter data," *Geophysical Research Letters*, Vol. 24, No. 11, pp. 1331-1334, June 1, 1997.
31. Schenewerk, M. S., T. M. vanDam, and R. S. Nerem, "Seasonal motion of the Annapolis, MD GPS Monument," *GPS Solutions*, Vol. 2, No. 3, pp. 41-49, 1999.
32. Chen, J. L., C. R. Wilson, D. P. Chambers, R. S. Nerem, and B. D. Tapley, "Global water mass balance and mean sea level variations", *Geophysical Research Letters*, Vol. 25, No. 19, pp. 3555-3558, 1998.
33. Chen, J. L., C. R. Wilson, R. J. Eanes, and R. S. Nerem, "Geophysical Interpretation of Observed Geocenter Motions", *Journal of Geophysical Research* Vol. 104, No. B2, pp. 2683-2690, 1999.
34. Nerem, R. S., "Measuring Very Low Frequency Sea Level Variations Using Satellite Altimeter Data," *Global and Planetary Change*, Vol. 20, No. 2-3, pp. 157-171, 1999.
35. Nerem, R. S., D. P. Chambers, E. W. Leuliette, G. T. Mitchum, and B. S. Giese, "Variations in Global Mean Sea Level Associated with the 1997-1998 ENSO Event: Implications for Measuring Long Term Sea Level Change", *Geophysical Research Letters*, Vol. 26, No. 19, pp. 3005-3008, 1999.
36. Goldstein, D. B., R. S. Nerem, E. S. Barker, J. V. Austin, A. B. Binder, W. C. Feldman, "Using the Impact of the Lunar Prospector Orbiter in a Polar Cold Trap to Detect Water Ice", *Geophysical Research Letters*, Vol. 26, No. 12, pp. 1653-1656, 1999.
37. Nerem, R. S., R. J. Eanes, P. Thompson, and J. L. Chen, "Observations of Seasonal Variations of the Earth's Gravity Field Using Satellite Laser Ranging and Geophysical Models", *Geophysical Research Letters*, Vol. 27, No. 12, pp. 1783-1786, 2000.

38. Chambers, D. P., J. L. Chen, R. S. Nerem, and B. D. Tapley, "Global Mean Sea Level Change and the Earth's Water Mass Budget", *Geophysical Research Letters*, Vol. 27, No. 19, p. 3073-3076, 2000.
39. Bills, B. G., and R. S. Nerem, "Mars Topography: Lessons Learned from Spatial and Spectral Domain Comparisons of MOLA and USGS Data", *J. Geophys. Res.*, Vol. 106, No. E12, pp. 32915-32926, 2001.
40. Goldstein, D. B., J. V. Austin, E. S. Barker, and R. S. Nerem, "Short-time Exosphere Evolution Following an Impulsive Vapor Release on the Moon", *J. Geophys. Res.*, Vol. 106, No. E12, pp. 32841-32846, 2001.
41. Park, K.-D., R. Nerem, J. L. Davis, M. S. Schenewerk, G. A. Milne, and J. X. Mitrovica, "Investigation of glacial isostatic adjustment in the northeast U.S. using GPS measurements", *Geophys. Res. Lett.*, 29(11), 1509, doi:10.1029/2001GL013782, 2002.
42. Leuliette, E. W., R. S. Nerem, and G. L. Russell, "Detecting Time Variations in Gravity Associated with Climate Change", *J. Geophys. Res.*, Vol. 107, No. B6, doi:10.1029/2001JB000404, 2002.
43. Chambers, D. P., T. J. Urban, D. Fujii, C. A. Mehlhaff, and R. S. Nerem, Low Frequency Variations in Global Mean Sea Level: 1950-2000, *J. Geophys. Res.*, Vol. 107, No. C4, pp. 1-10, 2002.
44. Nerem, R. S., and G. T. Mitchum, "Estimates of vertical crustal motion derived from differences of TOPEX/POSEIDON and tide gauge sea level measurements", *Geophys. Res. Lett.*, 29(19), 1934, doi:10.1029/2002GL015037, 2002.
45. Chambers, D. P. C. A. Mehlhaff, T. J. Urban, and R. S. Nerem, Analysis of interannual and low-frequency variability in global mean sea level from altimetry and tide gauges, *Phys. Chem. Earth*, Vol. 27, pp.1407-1411, 2002.
46. Gabor, M. J., and R. S. Nerem, "Satellite-Satellite Single Difference Phase Bias Calibration As Applied to Ambiguity Resolution", *Navigation*, Vol. 49, No. 4, pp. 223-242, 2003.
47. Bender, P. L., R. S. Nerem, and J. M. Wahr, Possible Future Use of Laser Gravity Gradiometers, *Space Sci. Rev.*, Vol. 108, No. 1, pp. 385-392, 2003.
48. Nerem, R. S., J. M. Wahr, and E. W. Leuliette, Measuring the Distribution of Ocean Mass Using GRACE, *Space Sci. Rev.*, Vol. 108, No. 1, pp. 331-344, 2003.
49. Gabor, M. J., and R. S. Nerem, Characteristics of Satellite-Satellite Single Difference Widelane Fractional Carrier Phase Biases, *Navigation*, Vol. 51, No. 1, pp. 77-92, 2004.
50. Park, K. D., R. S. Nerem, M. S. Schenewerk, and J. L. Davis, Site-Specific Multipath Characteristics of Global IGS and CORS GPS Sites, *J. Geodesy*, Vol. 77, No. 12, pp. 799-803, DOI 10.1007/s00190-003-0359-9, 2004.
51. Cazenave, A., and R. S. Nerem, Present-Day Sea Level Change: Observations and Causes, *Rev. Geophys.*, 42, RG3001, doi:10.1029/2003RG000139, 2004.
52. Leuliette, E. W., R. S. Nerem, and G. T. Mitchum, Results of TOPEX/Poseidon and Jason calibration to Construct a Continuous Record of Mean Sea Level, *Marine Geodesy*, Vol. 27, No. 1-2, pp. 79-94, 2004.

53. Chambers, D. P., J. Wahr, and R. S. Nerem, Preliminary observations of global ocean mass variations with GRACE, *Geophys. Res. Lett.*, 31, L13310, doi:10.1029/2004GL020461, 2004.
54. Yoon, Y. T., R. S. Nerem, M. M. Watkins, B. J. Haines, and G. L. Kruizinga, The Effects of GPS Carrier Phase Ambiguity Resolution on Jason-1, *Marine Geodesy*, Vol. 27, No. 3-4, 2004.
55. Lombard, A., A. Cazenave, K. DoMinh, C. Cabanes, and R. S. Nerem, Thermosteric sea level rise for the past 50 years: comparison with tide gauges and inference on water mass contribution, *Global and Planetary Change*, Vol. 48, No. 4, pp. 303-312, 2005.
56. Sutton, E. K., J. M. Forbes, and R. S. Nerem, Global thermospheric neutral density and wind response to the severe 2003 geomagnetic storms from CHAMP accelerometer data, *J. Geophys. Res.*, 110, A09S40, doi:10.1029/2004JA010985, 2005.
57. Forbes, J. M., G. Lu, S. Bruinsma, R. S. Nerem, and X. Zhang, Thermosphere density variations due to the 15-24 April 2002 solar events from CHAMP/STAR accelerometer measurements, *J. Geophys. Res.*, 110, A12S27, doi:10.1029/2004JA010856, 2005.
58. Luthcke, S. B., H. J. Zwally, W. Abdalati, D. D. Rowlands, R. D. Ray, R. S. Nerem, F. G. Lemoine, J. J. McCarthy, and D. S. Chinn, Recent Greenland Ice-Sheet Mass Loss Derived from High-Resolution Analysis of Gravity Observations, *Science*, 314, 1286-1289, 2006.
59. Bruinsma S., J. M. Forbes, R. S. Nerem, X. Zhang, Thermosphere density response to the 20–21 November 2003 solar and geomagnetic storm from CHAMP and GRACE accelerometer data, *J. Geophys. Res.*, 111, A06303, doi:10.1029/2005JA011284, 2006.
60. Nerem R. S., A. Cazenave, D. P. Chambers, L. Fu, E. W. Leuliette, G. T. Mitchum, Comment on “Estimating future sea level change from past records” by Nils-Axel Mörner, *Global and Planetary Change*, 55, 358-360, 2006.
61. Sutton E. K., J. M. Forbes, R. S. Nerem, T. N. Woods, Neutral density response to the solar flares of October and November, 2003, *Geophys. Res. Lett.*, 33, L22101, doi:10.1029/2006GL027737, 2006.
62. Nerem, R. S., E. Leuliette, and A. Cazenave, Present-day sea-level change: A review. *Comptes Rendus Geoscience*, 338, 1077-1083, 2006.
63. Sutton, E.K., R.S. Nerem, and J.M. Forbes, Atmospheric Density and Wind Measurements from Accelerometer Data, *J. Spacecraft and Rockets*, in review, 2007.
64. Tamisiea, M. E., J. X. Mitrovica, R. S. Nerem, E. W. Leuliette, and G. A. Milne, Correcting Satellite-Derived Estimates of Global Mean Sea Level Change for Glacial Isostatic Adjustment, *Geophys. J. Int.*, in review, 2007.
65. Chambers, D. P., M. Tamisiea, and R. S. Nerem, Effects of Ice Melting on GRACE Observations of Ocean Mass Trends, *Geophys. Res. Lett.*, in review, 2007.

Refereed Conference Proceedings

1. Koblinsky, C. J., R. S. Nerem, R. G. Williamson, and S. M. Klosko, “Global Scale Variations in Sea Surface Topography Determined from Satellite Altimetry, Sea Level

- Changes: Determination and Effects,” AGU Geophysical Monograph 69, IUGG Vol. 11, pp. 155-165, P. Woodworth, Editor, 1992.
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RESEARCH FUNDING R. STEVEN NEREM

LIST OF SPONSORED PROJECTS

Grants while at NASA/Goddard Space Flight Center

AGENCY	TITLE	START DATE	END DATE	PI/ CO-I	TOTAL
NASA/HQ	Ocean Topography Mapping, Improvement of the Marine Geoid, and Global Permanent Ocean Circulation Studies From TOPEX/Poseidon Altimeter Data (TOPEX Science Team)	1990	1996	Co-I	\$1,500,000
NASA/HQ	Gravity Field Improvement from Laser Data – LAGEOS II Science Team (LAGEOS II Science Team)	1991	1994	PI	\$300,000
NASA/GSFC	An Improved Determination of the Gravity Field of Venus (NASA/GSFC Director's Discretionary Fund)	1991	1991	PI	\$40,000
NASA/HQ	Time Variations of the Earth's Gravitational Field (NASA/Earth System Science Modeling & Satellite Data Analysis Program)	1992	1996	PI	\$300,000
NASA/HQ	The Subduction Zone Process in Alaska (Dynamics of the Solid Earth (DOSE))	1992	1996	Co-I	\$400,000
NASA/HQ	A High Resolution Model of the Venusian Gravitational Field Using Tracking Data from the Pioneer Venus Orbiter (Pioneer Venus Orbiter (PVO) Guest Investigator Program)	1992	1994	PI	\$70,000
NASA/HQ	An Improved High Resolution Gravity Model for Venus Using Magellan and Pioneer Venus Orbiter Tracking Data (Venus Data Analysis Program)	1993	1994	PI	\$112,000
NASA/HQ	Precision Orbit Determination for Global Change Studies Using Satellite Altimeter Data (Modeling, Data, and Information Systems)	1993	1995	PI	\$280,000
NASA/GSFC	The Measurement of Absolute Sea Level Using the Global Positioning System (NASA/GSFC Director's Discretionary Fund)	1993	1995	PI	\$70,000
NASA/HQ	A Gravity Model Research Program in Support of the GAMES Mission	1994	1996	PI	\$200,000
NASA/HQ	Measuring Absolute Sea Level Change in the Chesapeake Bay Using the Global Positioning System	1994	1996	PI	\$80,000
NOAA	An Evaluation of the Ecosystem Loss and Anomalous Sea Level Rise in the Blackwater Region of the Chesapeake Bay (Coastal Processes Program)	1994	1995	Co-I	\$100,000
NASA/HQ	An Improved High Resolution Gravity Model for Venus Using Magellan Post-Aerobraking Tracking Data (Planetary Geology and Geophysics Program)	1995	1996	PI	\$50,000

Grants at the University of Texas at Austin

AGENCY	TITLE	START DATE	END DATE	PI/ CO-I	TOTAL
NASA/JPL	Studies of Long-Term Sea Level Change Using TOPEX/Poseidon Altimeter Data (EOS ALT Program)	4/1996	4/1997	PI	\$123,000
NASA/HQ	Monitoring Sea Level Change and Land Subsidence in the Chesapeake Bay Using the Global Positioning System	7/1996	7/1997	PI	\$50,000
NASA/HQ	Detection of Vertical Crustal Motion in Alaska Using Tide Gauges and TOPEX/POSEIDON Altimeter Data (DOSE Program)	7/1996	7/1997	Co-I	\$10,000
NSF & NASA	A Study of Sea Level Change in the Northeastern U.S. Using GPS and Tide Gauge Data with Applications to Global Sea Level Change	9/1997	8/2000	PI	\$287,462
NASA/HQ	Measurement and Interpretation of Temporal Variations of the Earth's Gravity Field Using GPS and SLR Data (SENH Program)	7/1997	7/2000	PI	\$136,765
NASA/HQ	An Investigation of Very Low Frequency Sea Level Change Using TOPEX/POSEIDON Altimeter Data (T/P Extended Mission)	6/1997	6/1998	PI	\$139,000
Texas HECB	Measuring Atmospheric Precipitable Water Vapor in Texas Using the Global Positioning System (Advanced Technology Program)	1/1998	12/1999	PI	\$173,000
NASA/HQ	An Investigation of Very Low Frequency Sea Level Change Using Satellite Altimeter Data", NASA Headquarters (Jason-1 Science Team)	6/1998	8/2000	PI	\$223,722
NASA/JPL	Applications of the Global Positioning System	6/1998	6/1999	PI	\$40,000
NASA/HQ	Mass Distribution in the Earth's Systems: Space Geodetic Measurements and Geophysical Modeling (NASA Graduate Student Researchers Program – P. Thompson fellowship)	8/1998	8/2001	PI	\$66,000
NIMA	Future Advances in Global Gravity Field Modeling (NURI Program)	8/1998	8/2001	PI	\$114,000
NASA/JSC	GPS On-Orbit Receiver for Relative Navigation	2/1999	9/1999	Co-PI	\$60,000
NASA/JSC	NSTL Pseudolite Study Task	2/1999	9/1999	Co-PI	\$60,000
NASA/JPL	Altimeter Range Processing Analysis for Spacecraft Navigation about Asteroids and Comets	4/1999	9/2000	PI	\$45,000
NASA/HQ	Using the Impact of the Lunar Prospector into a Polar Cold Trap to Detect Water Ice	7/1999	7/2000	Co-PI	\$10,000
Research Corp.	Modeling and Observations of the Lunar Prospector Impact with the Moon	7/1999	7/2000	Co-I	\$3,333
UT COE	Modeling and Observations of the Lunar Prospector Impact with the Moon	1/1999	1/2000	Co-I	\$10,000
NASA/STSI	Using the Impact of Lunar Prospector into a South Polar Cold Trap to Detect Water Ice	6/1999	6/2000	Co-I	\$7,500

Grants at the University of Colorado

AGENCY	TITLE	START DATE	END DATE	PI/ CO-I	TOTAL
NSF & NASA	A Study of Sea Level Change in the Northeastern U.S. Using GPS and Tide Gauge Data with Applications to Global Sea Level Change	8/2000	8/2003	PI	\$62,538
NASA/HQ	Measurement and Interpretation of Temporal Variations of the Earth's Gravity Field Using GPS and SLR Data	8/2000	12/2002	PI	\$60,235
NASA/HQ	An Investigation of Very Low Frequency Sea Level Change Using Satellite Altimeter Data	8/2000	6/2004	PI	\$576,278
NASA/JPL	GPS Integer Ambiguity Resolution to Support POD for the Jason-1 Satellite	8/2001	8/2003	PI	\$130,000
NASA/HQ	Improvements In The Estimation Of The Earth's Gravity Field Using GRACE Mission Data (NASA ESS Fellowship for D. Kutter)	8/2001	8/2002	PI	\$22,000
NIMA	Future Advances in Global Gravity Field Modeling	8/2000	6/2002	PI	\$167,000
NASA/JPL	Using Global Terrestrial GPS Measurements to Unravel the Emerging Altimetric Record of Global Sea-Level Change	1/2001	1/2004	PI	\$90,000
NSF	Space Weather Program: Thermospheric Density and Wind Perturbations During Geomagnetically Disturbed Periods	7/2002	7/2006	Co-PI	\$484,000
National Inst. Aerospace	Design of a Comet and Asteroid Protection System	1/2003	5/2003	PI	\$24,000
NASA/HQ	Interferometric Range Transceiver (IRT) for Measuring Temporal Gravity Variations (Instrument Incubator Program)	8/2003	7/2006	PI	\$2,910,000
NASA/HQ	Unraveling the Record of Sea Level Change in the Northeastern U.S. Using GPS and Tide Gauge Data with Applications to Coastal Hazards (SENH Program)	7/2003	6/2006	PI	\$254,000
AGI	AGI Orbit Determination Study	9/2003	8/2004	Co-PI	\$70,000
NASA/HQ	A Multi-Disciplinary Investigation of Present-Day Sea Level Change	1/2004	12/2006	PI	\$999,900
NASA/HQ	An Investigation of Very Low Frequency Sea Level Change Using Satellite Altimeter Data	7/2004	6/2008	PI	\$762,000
NOAA	The Contribution of Tide Gauges to Sea Level Change Studies	7/1/03	6/30/05	PI	\$98,000
NASA	A Study of the First Global Measurements of the Water Cycle	7/1/05	6/30/08	Co-PI	\$150,000
NSF	Crustal Deformation Measurements and a Multidisciplinary Geophysical Investigation of the Rio Grande Rift	9/1/05	8/31/08	Co-PI	\$481,000

GRADUATE STUDENT SUPERVISION R. STEVEN NEREM

Ph.D. Supervisions Completed

Gabor, Michael, 12/99, “GPS Carrier Phase Ambiguity Resolution Using Satellite-Satellite Single Differences”, Dept. of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin

Park, Kwan-Dong, 12/00, “Determination of glacial isostatic adjustment parameters based on precise point positioning using GPS”, Dept. of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin

Yoon, Yoke, 12/03, “Resolving GPS Carrier Phase Ambiguities for Low Earth Orbit Spacecraft”, Dept. of Aerospace Engineering Sciences, University of Colorado at Boulder.

Thompson, Blair F., 5/2005, “Spaceborne Accelerometry and Temporal Gravity Analysis from the CHAMP Satellite Mission”, Dept. of Aerospace Engineering Sciences, University of Colorado at Boulder.

Ph.D. Supervisions in Progress

Morken, Daniel (expected 5/06)

Sutton, Eric (with Jeff Forbes)

Parker, Jeff (with George Born)

Loomis, Bryant

M.S. Supervisions Completed

Carter, Justin, 5/98 (no thesis), Dept. of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin

Curell, Phillip, 8/98 “GRACE Orbit Analysis Tool and Parametric Analysis”, Dept. of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin

Gay, Robert 5/99, "Mars Entry Navigation with Surface and Orbiting Beacons", Dept. of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin

Whitlock, David 5/2000, “The Measurement of Precipitable Water Vapor Over Texas Using the Global Positioning System”, Dept. of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin

Mehlhoff, Chris, 8/2000, “Reconstructing Sea Level Change from Tide Gauges and Empirical Orthogonal Functions Derived from TOPEX/POSEIDON Altimetry”, Dept. of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin

Bamford, William, 12/2000, "Orbit Determination and Comparison for the GLONASS Satellites", Dept. of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin

Pelletier, Frederick, 12/2000, "Altimeter Range Crossover Analysis for the Near Earth Asteroid Rendezvous Mission", Dept. of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin

Courtney, David, 5/2001, "A Simulation Study of Simultaneous Multiple Low Satellite GPS Double-Differencing for Orbit Determination", Dept. of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin

Morken, Dan, 5/2003 (no thesis), Dept. of Aerospace Engineering Sciences, University of Colorado at Boulder.

Parker, Jeff, 5/2003 (no thesis), Dept. of Aerospace Engineering Sciences, University of Colorado at Boulder.

Hausman, Matthew, 5/2003, "Orbit Determination Techniques of a Conceptual Space Based Observatory System for the Detection and Monitoring of Near-Earth Objects"

M.S. Supervisions in Progress

Jakub, Tom

Wiese, David

Other Thesis Committees

Ph.D. Committees – Rodney Anderson, Cam Meek, Dallas Masters, John Braun, Archie Paulson

M.S. Committees -

**TEACHING
R. STEVEN NEREM**

Semester	Course
Spring 1996	ASE389P Remote Sensing from Space
Fall 1996	ASE372L Applications of the Global Positioning System
Spring 1997	ASE389P Remote Sensing from Space
Fall 1997	ASE372L Applications of the Global Positioning System ASE366K Spacecraft Dynamics
Spring 1998	ASE389P Remote Sensing from Space
Fall 1998	ASE372L Applications of the Global Positioning System ASE366K Spacecraft Dynamics
Spring 1999	ASE389P The Global Positioning System
Fall 1999	ASE372L Applications of the Global Positioning System ASE366K Spacecraft Dynamics
Spring 2000	ASE389P The Global Positioning System
Fall 2000	ASEN5050 Spaceflight Dynamics
Spring 2001	ASEN5060 Satellite Geodesy
Fall 2001	ASEN5050 Spaceflight Dynamics
Spring 2002	Visiting Scientist in Toulouse, France
Fall 2002	ASEN5050 Spaceflight Dynamics ASEN4018 Senior Projects
Spring 2003	ASEN3200 Orbital Mechanics / Attitude Dynamics & Control ASEN4028 Senior Projects
Fall 2003	ASEN5050 Spaceflight Dynamics (CAETE) ASEN4018 Senior Projects
Spring 2004	ASEN5060 Satellite Geodesy (CAETE) ASEN4028 Senior Projects
Fall 2004	ASEN5050 Spaceflight Dynamics (CAETE)
Spring 2005	ASEN3200 Orbital Mechanics / Attitude Dynamics & Control
Fall 2005	ASEN5050 Spaceflight Dynamics (CAETE)
Spring 2006	ASEN5060 Satellite Geodesy ASEN5519 Satellite Technology Lab (new class)

Robert Steven Nerem, Professor
University of Colorado at Boulder
Department of Aerospace Engineering Sciences

Dr. Nerem joined the faculty in August 2000 after spending over 6 years at NASA/Goddard Space Flight Center as a geophysicist, and over 4 years at the University of Texas at Austin as an assistant and associate professor. He received his B.S. degree in Geology from Colorado State University in 1982, and his M.S. and Ph.D. degrees in Aerospace Engineering from The University in 1985 and 1989 respectively. Dr. Nerem also worked for NOAA and the Jet Propulsion Laboratory during his graduate training.

Dr. Nerem has more than 50 refereed journal articles and 13 refereed conference publications covering a variety of topics in satellite orbit determination, geophysics, oceanography, and planetary science. He has personally given more than 50 presentations at scientific conferences, in addition to co-authoring an equal number of presentations, and has chaired a dozen sessions at those conferences. In addition, he has co-authored a chapter for a book on the gravity field and co-edited a book on gravity field determination. He has served as an Associate Editor of the *Journal of Geophysical Research - Solid Earth*, and as Geodesy Editor for *Eos Transactions* of the American Geophysical Union (AGU). He also was awarded an Editors' Citation for Excellence in Refereeing by the journal *Geophysical Research Letters* in 1993. In 2002, he was elected to a 2-year term as Secretary of the Geodesy Section of the AGU.

Dr. Nerem is a specialist in satellite orbit determination, satellite remote sensing, and space geodesy, the latter dealing with measuring the Earth's shape, gravity field, and sea level using space-based techniques. He has also applied these techniques to measuring the gravity fields of Venus and Mars. Dr. Nerem has participated in several NASA flight projects including Lageos II, TOPEX/Poseidon, Jason-1, Pioneer Venus Orbiter, and Mars Observer. In 1995, Dr. Nerem was awarded NASA's Exceptional Scientific Achievement Medal for his research in the area of gravity field determination, in addition to a dozen NASA achievement and performance awards he received while at NASA. Dr. Nerem's research is currently supported by the National Science Foundation, NASA, and NOAA.

Since arriving at CU, Dr. Nerem has taught graduate level classes in Space Flight Dynamics and Satellite Geodesy, and undergraduate classes in orbital mechanics and senior projects. In the past he has taught courses on Remote Sensing from Space, Applications of the Global Positioning System, and Orbital Mechanics, both at the graduate and undergraduate levels. He is currently Associate Director of CU's Colorado Center for Astrodynamics Research, and a Fellow of CU's Cooperative Institute for Research in Environmental Sciences.