

THE UNIVERSITY OF TEXAS AT AUSTIN
Cockrell School of Engineering

FULL NAME: Srinivas Bettadpur **TITLE:** Professor
ENDOWED POSITION: FSX Professorship in Space Application and Exploration (Fellow)
DEPARTMENT: Aerospace Engineering and Engineering Mechanics

EDUCATION:

The Punjab Engineering College	Mechanical Engineering	B.E.	1984
Indian Institute of Technology, Kanpur	Aeronautical Engineering	M.Tech.	1985
The University of Oklahoma, Norman	Aerospace Engineering	M.S.	1987
The University of Texas at Austin	Aerospace Engineering	Ph.D.	1993

PROFESSIONAL REGISTRATION: Not Registered

CURRENT AND PREVIOUS ACADEMIC POSITIONS:*Current*

Professor, Dept. of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin, Sep 2021 to present.

Professor (by courtesy), Department of Geological Sciences, The University of Texas at Austin, Sep 2021 to present.

Previous

Director (Academic), Center for Space Research, The University of Texas at Austin, Jan 2018 to August 2023.

Associate Professor, Dept. of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin, August 2015 to August 2021.

Associate Professor (by courtesy), Department of Geological Sciences, The University of Texas at Austin, Sep 2019 to Aug 2021.

Research Professor, Department of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin, January 2010 to August 2015.

Lecturer, Department of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin, Spring semesters, 1995 to 1998.

Postdoctoral Fellow, The University of Texas at Austin, September 1993 to June 1994.

OTHER PROFESSIONAL EXPERIENCE:

Otto Mønsted Visiting Professor, DTU Space, Danish Technical University, Apr 11 to June 19, 2023.

Affiliate, Applied Research Laboratories, The University of Texas at Austin, 2017 to present

Senior Research Scientist, Center for Space Research, The University of Texas at Austin, September 2003 to December 2009.

Research Scientist, Center for Space Research, The University of Texas at Austin, April 1998 to August 2003.

Research Engineer/Scientist Associate V, The University of Texas at Austin, September 1996 to March 1998.

Research Engineer/Scientist Associate IV, Center for Space Research, The University of Texas at Austin, June 1994 to August 1996.

MEMBERSHIPS IN PROFESSIONAL AND HONORARY SOCIETIES:

Fellow (2011), International Association of Geodesy (IAG)

Associate Fellow (2011), American Institute of Aeronautics and Astronautics (AIAA)

Member, American Geophysical Union (AGU)

Member, American Astronautical Society (AAS)

Member, Institute of Electrical and Electronics Engineers (Societies AES and GRSS).

Member, American Association for the Advancement of Sciences (AAAS)

HONORS AND AWARDS:

NASA Exceptional Public Achievement Medal (2018), for "...exceptional achievements in promoting the science and applications of GRACE Mission data."

The Vening-Meinesz Medal of the European Geosciences Union (2016) - Citation: "The 2016 Vening Meinesz Medal is awarded to Srinivas Bettadpur in recognition of his outstanding contributions to precise orbit determination and ocean-tide modeling, and his pioneering developments in the field of time-variable gravity field determination from satellite-to-satellite tracking data."

NASA Group Achievement Award (2013) for the Ice Mass Balance Inter-comparison Exercise (IMBIE)

The William T. Pecora Team Award (2007), from US Dept. of Interior and NASA, to GRACE Team. "...for the design, development, and successful operation of new methods of satellite-based measurement of the Earth's gravity field resulting in significant contributions to the understanding of the changing global environment."

NASA Group Achievement Award (2003) for the Gravity Recovery and Climate Experiment Project (GRACE)

International Association of Geodesy Best Publication Award for Young Scientists, 1995.

N.K. Wright Centennial Memorial Endowed Presidential Scholarship Fund, UT Austin, 1990-91

PROFESSIONAL SOCIETY AND MAJOR GOVERNMENTAL COMMITTEES, EDITORIAL BOARDS, AND CONFERENCES ORGANIZED/CHAired:

Outside Committees

President, Commission-2 (Gravity Field) - International Association of Geodesy (2023-2027)

Co-Chair (by invitation), NASA/ESA Joint Mass Change Mission Expert Group, May 2021-November 2022.

Chair (invited by IAGG), International EGM2020 Gravity Field Evaluation Working Group, 2018-present.

National Academies Committee on Evolving the Geodetic Infrastructure to Meet New Scientific Needs (member), "...to identify key connections between geodesy and priority Earth science questions in the recent Decadal Survey (NASEM, 2018)" 2018 to 2019.

Chair (competed), NASA/ESA Interagency Gravity Science Working Group (IGSWG), May 2016.

Member, IMBIE 2012, ESA/NASA Ice-sheet Mass Balance Intercomparison Exercise, 2011-2012.

Steering Committee, Global Geodetic Observing System (GGOS) 2005 to 2009.

Conference Activities

Convener, Host and Chair of the Scientific Organizing Committee, Gravity Geoid and Height Symposium, Third Joint Meeting of the IGFS and Commission 2 of the IAG, Sep 12-14, 2022, Austin, Texas.

Convener

IAG Symposia G03 (Time Variable Gravity Field), IUGG 26th General Assembly, July 2015, Prague, Czech Republic.

GRACE Science Team meetings: ~ 120 international attendees; arranged scientific program & logistics, Austin, Texas. Oct 10-12, 2017; Sep 21-22, 2015; Oct 23-25, 2013; Aug 8-10, 2011; Nov 5-6, 2009; Dec 12-13, 2008 (San Francisco, CA); Dec 8-9, 2006 (San Francisco, CA); Oct 13-14, 2005; and Oct 8-10, 2003.

Co-Convener

IAG Symposia G03 (Time Variable Gravity Field), IUGG 27th General Assembly, July 2023, Berlin, Germany.

IAG Symposia G03 (Time Variable Gravity Field), IUGG 27th General Assembly, July 2019, Montreal, Canada.

IAG Symposia G03 (Time Variable Gravity Field), IAG/IASPEI Joint Assembly, Aug 2017, Kobe, Japan.

GRACE Science Team meetings: ~ 120 international attendees; arranged scientific program, Potsdam, Germany; Oct 2020 (Online); Sep 2019 (Pasadena, CA); Oct 2018; Oct 2016; Oct 2014; Oct 2012; Oct 2010; Oct 2007 (Munich, Germany); July 2004.

Member Scientific/Organizing Committee

ESA Living Planet Symposium, May 2019, Milan, Italy.

Second Joint Meeting of the IGFS and Commission 2 of the IAG, Sep 2018, Copenhagen, Denmark.

Indo-US Workshop on Hydrology, Indo-US Science & Technology Forum, Nov 2016, Hyderabad, India.

Second International Symposium of the International Gravity Field Service, Sep 2010, Fairbanks, Alaska.

American Geophysical Union Fall Meetings:

Convener, G44x, San Francisco CA, Dec 2019

Convener G13x, Washington DC, Dec 2018
 Convener G21x, New Orleans LA, Dec 2017
 Primary Convener G11x, San Francisco CA, Dec 2016
 Convener G31x, San Francisco CA, Dec 2015
 Primary Convener G22x, San Francisco CA, Dec 2014

Journal Activities

Associate Editor, *Journal of Geodesy*, September 2015 to August 2022
 Associate Editor, *Celestial Mechanics & Dynamical Astronomy*, September 2010 to September 2014.

OTHER PROFESSIONAL HIGHLIGHTS:

Fulbright Specialist Program visitor to National Geophysical Research Institute, Hyderabad, India, July 10-26, 2020 (scrapped due to the coronavirus pandemic).
 Research visit under Discovery International Award of the Australia Research Council (ARC), as part of Discovery Award to the Research School in Earth Sciences Australian National University, Canberra, Oct 19-31, 2019.
 Member of the Advisory Board, International Gravity Field Service, 2007 to present.
 Member, NASA GRACE Follow-On Science Team, 2011 to present.
 Member, NASA GRACE Science Team, 1998 to 2017.
 Vice-President, Commission 2 (Gravity), International Association of Geodesy, 2011-2015.
 Science Operations Manager, NASA GRACE Mission, 2001-2015.
 Invited Lectures outside of conferences:
 Board of Visitors Summer Meeting, McDonald Observatory UT Austin, “The McDonald Geodetic Observatory”, July 27, 2019.
 IUSSTF Bilateral Workshop on Regional Hydrology using Spaceborne Gravity Observations, November 14-16, 2016, Hyderabad, India.
 W & E Heraeus Autumn School in Global Gravity Field Modeling from Satellite-to-Satellite Tracking, Lecture “Classical (Variational) Methods”, October 4-9, 2015, Bad Honnef, Germany.
 National Geodetic Service Airborne Gravity for Geodesy Summer School, “Spaceborne gravity from GRACE and GOCE: the time-mean and time-variable fields”, May 23-27, 2016, Silver Spring, Maryland.
 Indian National Centre for Earth Science Studies, “From GRACE to GRACE Follow On and Beyond”, Dec 18, 2015, Thiruvananthapuram, Kerala, India.

Current Review Activities:

Reviewer – Various journals.

UNIVERSITY COMMITTEES/ADMINISTRATIVE ASSIGNMENTS:

Administrative Assignments

Director (Academic), Center for Space Research, Cockrell School of Engineering, Jan 2018 – Aug 2023.

University

Cockrell School of Engineering

Mental Health and Wellness for students, staff, and faculty (*ad hoc*) Committee, AY2019-20.
 Undergraduate Advising (*ad hoc*) Committee, AY2018-19
 Academic Support Committee, AY2017-18
 Academic Support Committee, AY2016-17
 Department Chair Review Committee, ASE/EM, Spring 2016
 Space and Earth Engineering Strategic Planning Committee, 2009

Department

Orbital Mechanics Area Coordinator, ASE/EM, Sep 2023 to present.
 Member, ASE/EM Undergraduate Curriculum Committee, Sep 2021 to present
 ASE and EM Graduate Studies Committees, AY2010-present

DGS Graduate Studies Committee, AY2018-present

Chair, ASE/EM Undergraduate Curriculum Committee, AY Sep 2016 to August 2021

Chair, ASE/EM *ad hoc* Committee on Well-Being, AY 2020-21.

ASE/EM Faculty Search Committee (Systems & Orbits), AY2019-20

ASE/EM Diversity Committee, AY2019-20

ASE/EM Faculty Search Committee (Systems & Orbits), 2017-18

PUBLICATIONS:

Refereed Journal Publications (italicized first authors are student advisees)

1. Kumar, K., D. Yadav and B.V. Srinivas (1991), "Adaptive Noise Models for the Extended Kalman Filter", *Journal of Guidance, Control and Dynamics*, 14 (2), 475-477.
2. Bettadpur, S., J.B. Lundberg and B.E. Schutz (1992), "Spherical Harmonic Synthesis and Least Squares Computations in Satellite Gravity Gradiometry", *Bulletin Geodesique*, 66 (2), 261-271.
3. Bettadpur, S. and R.J. Eanes (1994), "Geographical Representation of Radial Orbit Errors Due to Ocean Tides", *Journal of Geophysical Research*, 99(C12), 24883-24894.
4. Bettadpur, S. (1995), "Hotine's Geopotential Formulation: Revisited", *Bulletin Geodesique*, 69(3), 135-142. [*This paper won the 1995 IAG Best Publication Award for Young Scientist*]
5. Ray, R., S. Bettadpur, R.J. Eanes, and E.J.O. Schrama (1995), "Geometrical Determination Love Number h_2 at Four Tidal Frequencies", *Geophysical Research Letters*, 22(16), 2175-2178.
6. Lundberg, J., R.J. Eanes and S. Bettadpur (2000), "Long arc orbit determination solutions using Encke's method", *Applied Mathematics and Computation*, v 113, n 1, 1 July 2000, p43-53.
7. Dunn, C.E., W. Bertiger, Y. Bar-Sever, S. Desai, B. Haines, D. Kuang, G. Franklin, I. Harris, G. Kruizinga, T. Meehan, S. Nandi, D. Nguyen, T. Rogstad, J. B. Thomas, J. Tien, L. Romans, M. Watkins, S-C Wu, S. Bettadpur, and J.R. Kim (2003), "Instrument of GRACE (GPS Augments Gravity Measurements, Application Challenge, *GPS World*, Vol 14, No.2, Feb 2003.
8. Tapley, B.D., D. Chambers, S. Bettadpur and J. Ries (2003), "Large scale ocean circulation from the GRACE GGM01 geoid", *Geophysical Research Letters*, 30(22), 2163, Nov 15.
9. Tapley, B., S. Bettadpur, M. Watkins and C. Reigber (2004), "The Gravity Recovery And Climate Experiment: Mission Overview and Early Results", *Geophysical Research Letters*, 31, L09607, doi:10.1029/2004GL019920.
10. Tapley, B., S. Bettadpur, J. Ries, P. Thompson and M. Watkins (2004), "GRACE measurements of mass variability in the Earth system", *Science*, Vol 305, Issue 5683, 503-505, 23 July 2004, doi: 10.1126/science.1099192.
11. Thompson, P., S. Bettadpur and B. Tapley (2004), "Impact of short period, non-tidal, temporal mass variability on GRACE gravity estimates", *Geophysical Research Letters*, 31, L06619, doi:10.1029/2003GL019285.
12. Tapley, B., J. Ries, S. Bettadpur, D. Chambers, M. Cheng, F. Condi, B. Gunter, Z. Kang, P. Nagel, R. Pastor, T. Pekker, S. Poole, and F. Wang (2005), "GGM02 – In improved Earth gravity model from GRACE", *Journal of Geodesy*, Sep 2005, doi: 10.1007/s00190-005-0480-z.
13. Montenbruck, O., M. Kirschner, S. D'Amico, and S. Bettadpur (2006), "E/I-Vector separation for safe switching of the GRACE formation, *Aerospace Science & Technology*, 12 May 2006, doi: 10.1016/j.ast.2006.04.001.
14. Gunter, B., J. Ries, S. Bettadpur, B. Tapley (2006), "A simulation study of the errors of omission and commission for GRACE RL01 gravity fields", *Journal of Geodesy*, Sep 2006, doi: 10.1007/s00190-006-0083-3.
15. Kang, Z., B. Tapley, S. Bettadpur, J. Ries and P. Nagel (2006), "Precise orbit determination for GRACE using accelerometer data", *Advances in Space Research*, v 38, n 9, p2131-2136.
16. Kang, Z., Tapley, B., S. Bettadpur, J. Ries, P. Nagel and R. Pastor (2006), "Precise orbit determination for the GRACE mission using only GPS data", *Journal of Geodesy*, v 80, n 6, Sep 2006, doi: 10.1007/s00190-006-0073-5.
17. Kang, Z., Tapley, B., J. Ries, S. Bettadpur, P. Nagel (2007), "Impact of GPS antenna offsets on GPS-based precise orbit determination", *Advances in Space Research*, v 39, n 10, 2007, pp 1524-1530.
18. Tapley, B., J. Ries, S. Bettadpur and M. Cheng (2007), "Neutral density measurements from the Gravity Recovery and Climate Experiment Accelerometers", *Journal of Spacecrafts & Rockets*, v 44, n 6, Nov-Dec 2007.

19. Flury, J., S. Bettadpur and B. Tapley (2008), "Precise accelerometry on-board the GRACE gravity mission", *Advances In Space Research*, v 42, n 8, Oct 15, 2008, pp 1414-1423.
20. Kang, Z., B. Tapley, J. Chen, J. Ries and S. Bettadpur (2009), "Geocenter variations derived from GPS tracking of the GRACE satellites", *Journal of Geodesy*, v 83, n 10, pp 895-901, doi: 10.1007/s00190-009-0307-4.
21. Wang, F., S. Bettadpur, H. Save and G. Kruizinga (2010), "Determination of center-of-mass of gravity recovery and climate experiment satellites", *Journal of Spacecrafts and Rockets*, v 47, n 2, p371-379.
22. Steckler, M., S. Nooner, S.H. Akhter, S.K. Chowdhury, S. Bettadpur, L. Seeber and M.G. Kogan (2010), "Modeling Earth deformation from monsoonal flooding in Bangladesh using Hydrographic, GPS and Gravity Recovery And Climate Experiment (GRACE) data" (2010), *Journal of Geophysical Research*, 115, B08407, doi: 10.1029/2009JB007018.
23. Save, H., S. Bettadpur and B. Tapley (2012), "Reducing errors in GRACE gravity solutions using regularization", *Journal of Geodesy*, v 86, n 9, pp 695-711, doi: 10.1007/s00190-012-0548-5.
24. Bonin, J., S. Bettadpur and B. Tapley (2012), "High frequency signal and noise estimates of CSR GRACE RL04", *Journal of Geodesy*, doi: 10.1007/s00190-012-0572-5.
25. Ko, U.-D., B. Tapley, J. Ries, and S. Bettadpur (2012), "High-Frequency Noise in the Gravity Recovery and Climate Experiment Intersatellite Ranging System", *Journal of Spacecraft and Rockets*, 49:1163–1173, doi:10.2514/1.A32141.
26. Shepherd, A., E. Ivins, G. A. V. Barletta, M. Bentley, S. Bettadpur, K. Briggs, D. Bromwich, R. Forsberg, N. Galin, M. Horwath, S. Jacobs, I. Joughin, M. King, J. Leaerts, J. Li, S. Ligtenberg, A. Luckman, S. Luthcke, M. McMillan, R. Meister, G. Milne, J. Mouginot, A. Muir, J. Nicolas, J. Paden, A. Payne, H. Pritchard, E. Rignot, H. Rott, L. Sorensen, T. Scambos, B. Scheuch, E. Schrama, B. Smith, A. Sundal, J. van Angelen, W. van de Berg, M. van den Broeke, D. Vaughan, I. Velicogna, J. Wahr, P. Whitehouse, D. Wingham, D. Yi, D. Young, and J. Zwally (2012), "A reconciled estimate of ice-sheet mass balance, *Science*, Vol 338, N 6111, pp 1183-1189, doi: 10.1126/science.1228102, 30 November 2012.
27. Sakumura, C., Bettadpur, S., and Bruinsma, S., (2014 Mar), "Ensemble prediction and intercomparison analysis of GRACE time-variable gravity field models", *Geophysical Research Letters*, 41:1389–1397, doi:10.1002/2013GL058632.
28. McCullough, C., S. Bettadpur and K. MacDonald, (2015 May/June), "Accuracy of Numerical Algorithms for Satellite Orbit Propagation and Gravity Field Determination," *Journal of Spacecraft and Rockets*, Vol. 52, No. 3 (2015), pp. 766-775 doi: 10.2514/1.A33008.
29. Wahr, J., R. S. Nerem, and S. V. Bettadpur (2015 Jun), The pole tide and its effect on GRACE time-variable gravity measurements: Implications for estimates of surface mass variations. *Journal of Geophysical Research (Solid Earth)*, 120, 4597–4615. doi: 10.1002/2015JB011986.
30. Sakumura, C., S. Bettadpur, H. Save and C. McCullough (2016 May), "High-frequency terrestrial water storage signal capture via a regularized sliding window mascon product from GRACE," *Journal of Geophysical Research (Solid Earth)*, Vol. 121, No. 5. pp 4014-4030, doi: 10.1002/2016JB012843.
31. Save, H., S. Bettadpur and B. Tapley (2016 Oct), "High resolution CSR GRACE RL05 mascons," *Journal of Geophysical Research (Solid Earth)*, Vol. 121, No. 10, pp 7547-7569, doi: 10.1002/2016JB013007.
32. Chen, J., B. Tapley, H. Save, M. Tamisiea, S. Bettadpur, J. Ries (2018 Nov), "Quantification of ocean mass change using gravity recovery and climate experiment, satellite altimeter, and Argo floats observations, *Journal of Geophysical Research: Solid Earth*, 123, n 11, p 10212-25, doi:10.1029/2018JB016095.
33. M. Z. Hakuba, G.L. Stephens, B. Christophe, A.E. Nash, B. Foulon, S. Bettadpur, B. Tapley, F.H. Webb (2019 Jan), "Earth's Energy Imbalance Measured From Space," in *IEEE Transactions on Geoscience and Remote Sensing*. doi: 10.1109/TGRS.2018.2851976.
34. Kornfeld, R., B. Arnold, M.A. Gross, N. Dahya, W. Klipstein, P. Gath and S. Bettadpur (2019 May/June), "GRACE-FO: The Gravity Recovery And Climate Experiment Follow-On Mission", *Journal of Spacecrafts & Rockets*, v 56, n 3, p 931-951, doi: 10.2514/1.A34326.
35. Tapley, B., Watkins, M., Flechtner, F., Reigber, C., Bettadpur, S., Rodell, M., & Sasgen, I., Famiglietti, J., Landerer, F., Chambers, D., Reager, J., Gardner, A., Save, H., Ivins, E., Swenson, S., Boening, C., Dahle, C., Wiese, D., Dobslaw, H., Velicogna, I. (2019 May), "Contributions of GRACE to understanding climate change". *Nature Climate Change*. doi:10.1038/s41558-019-0456-2.
36. Kang, Z., B. Tapley, J. Chen, J. Ries, S. Bettadpur (2019 Aug), "Geocenter motion time series derived from GRACE GPS and LAGEOS observations", *Journal of Geodesy* 93:1931. doi:10.1007/s00190-019-01292-4.
37. Li, Bailing, Matthew Rodell, Sujay Kumar, Hiroko Kato Beaudoin, Augusto Getirana, Benjamin F. Zaitchik, Luis Gustavo de Goncalves, Camila Cossetin, Soumendra Bhanja, Abhijit Mukherjee, Siyuan Tian, Natthachet Tangdamrongsub, Di Long, Jamiat Nanteza, Jejung Lee, Frederick Policelli, Ibrahim B. Goni, Djoret Daira,

- Mohammed Bila, Gabriëlle de Lannoy, David Mocko, Susan C. Steele-Dunne, Himanshu Save, Srinivas Bettadpur (2019 Sep), “Global GRACE data assimilation for groundwater and drought monitoring: Advances and challenges”, *Water Resources Research*, 55, 7564-7586, doi:10.1029/2018WR024618
38. Getirana, A., M. Rodell, S. Kumar, H.-K. Beaudoin, K. Arsenault, B. Zaitchik, H. Save, and S. Bettadpur. (2020 Jan), “GRACE Improves Seasonal Groundwater Forecast Initialization over the United States”, *Journal of Hydrometeorology*, Vol 21. No.1, pp 59-71, doi: 10.1175/JHM-D-19-0096.1
 39. Landerer, Felix W, Flechtner, Frank M, Save, Himanshu, Webb, Frank H, Bandikova, Tamara, Bertiger, William I, Bettadpur, Srinivas V, Byun, Sung Hun, Dahle, Christoph, Dobslaw, Henryk, Fahnestock, Eugene, Harvey, Nate, Kang, Zhigui, Kruizinga, Gerhard L. H, Loomis, Bryant D, McCullough, Christopher, Murböck, Michael, Nagel, Peter, Paik, Meegyeong, Pie, Nadege, Poole, Steve, Strelakov, Dmitry, Tamisiea, Mark E, Wang, Furun, Watkins, Michael M, Wen, Hui-Ying, Wiese, David N, Yuan, Dah-Ning (2020 May), “Extending the global mass change data record: GRACE Follow-On instrument and science data performance”, *Geophysical Research Letters*, v.47 (12), doi:10.1029/2020GL088306.
 40. Kang, Z., S. Bettadpur, P. Nagel, H. Save, S. Poole, and N. Pie, (2020 Aug) “GRACE-FO precise orbit determination and gravity field recovery,” *Journal of Geodesy*, 94(9), doi:10.1007/s00190-020-01414-3.
 41. Chen, J.L., Tapley, B.D., Tamisiea, M., Save, H., Wilson, C.R., Bettadpur, S., Seo, K.W. (2021). Uncertainty Assessment of GRACE and GRACE Follow-On Observed Mass Changes, *J. Geophys. Res. (Solid Earth)*, doi:10.1029/2021JB022124.
 42. Pie, N., Bettadpur, S. V., Tamisiea, M., Krichman, B., Save, H., Poole, S., et al. (2021 Nov). “Time variable Earth gravity field models from the first spaceborne laser ranging interferometer”. *Journal of Geophysical Research: Solid Earth*, 126, e2021JB022392, doi:10.1029/2021JB022392.
 43. Krichman, B., S. Bettadpur, T. Pekker (2022 Nov). “Use of Mass Change Data from Satellite Gravimetry to Assess Earth System Model Physics”. *J. of Hydrometeorology*, doi: 10.1175/JHM-D-21-0216.1
 44. Skeens, J., York, J., Petrov, L., Munton, D., Herrity, K., Ji-Cathriner, R., Bettadpur, S., Gaussiran, T. (2023 Aug). First observations with a GNSS antenna to radio telescope interferometer. *Radio Science*, 58, e2023RS007734. doi:10.1029/2023RS007734.

Submitted Refereed Journal Publications

1. (in review), Kang et al. “GPS-based precise orbit determination of LEO satellites using space-based double-differenced observations,” *Jour. Astron. Sci.*
2. (in review) Rivera et al., “Framework for Measuring 1 mm-Accurate Local Survey Ties over Kilometer baselines at McDonald Geodetic Observatory”, to *Jour. Of Geodesy*.
3. (submitted) Wang et al., “Subtle land subsidence elevates future storm surge risks along the Gulf Coast”, to *AGU Advances*.

Refereed Conference Proceedings

1. Bettadpur, S. (1992), “Results from the simulations of geopotential coefficient estimation from gravity gradients”, *From Mars to Greenland*, Proceedings of the IAG Symposium 110, p 181, (O.L. Colombo, Ed.), Springer Verlag, 1992.
2. Eanes, R.J. and S. Bettadpur (1996), “Temporal variability of Earth’s gravitational field from satellite laser ranging”, IAG Symposia Series, Symposium G3 (R.H. Rapp ed.), Springer Verlag, 1996.
3. Tapley, B.D et al. (1997) The TEG-3 Geopotential Model, International Association of Geodesy, International Symposium No. 117, *Gravity, Geoid and Marine Geodesy*, p 453-460, J. Seagawa, H. Fujimoto, and S. Okubo, (Ed.), Springer-Verlag.
4. Ferreira, L.G., S. Bettadpur, M.T. Coe and M.H. Costa, (2012) IGARSS (IEEE Geoscience & Remote Sensing Symposium), “Water fluxes in the central Brazilian savanna: Seasonal patterns and land cover interdependencies as observed from GRACE, TRMM, and MODIS data”, doi: 10.1109/IGARSS.2012.6352009.
5. Kang, Z., J.C. Ries, S. Bettadpur, H. Save, B. Tapley (2022), “Combined gravity solution from SLR and GRACE/GRACE-FO”, International Association of Geodesy Symposium No. NNN, July 2021.

Conference Proceedings

1. Advances in Astronautical Sciences (1995), “Modifications to Encke's Method for Long Arc Orbit Determination Solutions,” Lundberg et al., v 76, n I, p 13-23.

2. AAS-99-144, AAS/AIAA Spaceflight Mechanics Meeting, "Simulations of the Gravity Recovery & Climate Experiment (GRACE) Mission", Kim et al., Breckenridge, CO, Feb 1999.
3. Advances in Astronautical Sciences (2000), "Mission Planning for the Twin GRACE Satellites", Fowler et al., v 105, n II, p 987-997.
4. Advances in Astronautical Sciences (2001), "The Accelerometer Proof Mass Offset Calibration of GRACE", Wang et al., v 108, n II, p 1665-1676.
5. AAS 01-334, AAS/AIAA Astrodynamics Specialist Conference, "CHAMP Precision Orbit Determination", Rim et al., Quebec City, Quebec, Canada, Aug 2001.
6. Advances in Astronautical Sciences (2002), "CHAMP precision orbit determination", Rim et al., v 109 I, 2002, p493-500.
7. Advances in Astronautical Sciences (2002), "Precise orbit determination for CHAMP using accelerometer data", Kang et al., v 112, n II, p 1405-1410.
8. Advances in Astronautical Sciences (2002), "Precise determination of accelerometer proof mass", Wang et al., v 112 II, p 739-752.
9. Advances in Astronautical Sciences (2002), "Antenna phase center determination of inter-communicating satellites" Wang et al., v 112 II, 2002, p1461-1471.
10. Advances in Astronautical Sciences (2003), "GRACE precise orbit determination," Kang et al., v 114, n SUPPL., p 223-2242.
11. AAS 03-622 (2003), AAS/AIAA Astrodynamics Specialist Conference, "Early results from the Gravity Recovery And Climate Experiment," Tapley et al., Big Sky, Montana, Aug 2003.
12. Advances in Astronautical Sciences (2005), "The design and development of the GRACE mission analysis tool," Mauldin et al., v 119, n III, Space Flight Mechanics 2004, p 3197-3208.
13. AIAA-2006-6171 (2006), "Neutral density measurements from the GRACE accelerometers," Tapley et al., AIAA/AAS Astrodynamics Specialist Conference, Keystone, CO, Aug 2006.
14. Advances in Astronautical Sciences (2008), "Determination of thermospheric winds from GRACE accelerometer data," Cheng et al., AAS/AIAA Spaceflight Mechanics Conference, v 130 PART2, p1181-1192,
15. AAS 08-179 (2008), "Orbital mechanics, perturbations, and GRACE science and mission design," S. Bettadpur, AAS/AIAA Spaceflight Mechanics Meeting, Galveston, TX, Jan 2008.
16. AIAA-2008-6949 (2008), "Thermospheric densities from analysis of 6-year GRACE accelerometer data", AIAA/AAS Astrodynamics Specialist Conference, Honolulu, HI, Cheng et al., Aug 2008.
17. ION GNSS (2013), "GPS-based precise relative orbit determination for LEO satellites using GPS double-differenced carrier phases," (Kang, Tapley, Bettadpur, and Nagel) 26th International Technical Meeting of the Satellite Division of the Institute of Navigation, ION GNSS 2013, v 4, p 3329-3335, 2013.
18. ASPRS 2016 Annual Conference, "Biodiversity response to industrialization and human expansion as seen in land cover change within the western ghats in the Hassan district" Prakash, Supraj (University of Texas Center for Space Research, United States); Bettadpur, Srinivas; Howard, Teresa; Ramamoorthy, T.P. Source: ASPRS 2016 Annual Conference: IGTF 2016 - Imaging and Geospatial Technology Forum.
19. ION GNSS 2016, "Effects of IGS products on GNSS-based precise orbit determination," Kang, Zhigui (Center for Space Research, University of Texas, Austin, United States); Tapley, Byron; Bettadpur, Srinivas Source: 29th International Technical Meeting of the Satellite Division of the Institute of Navigation, v 5, p 3707-3714, 2016, 29th International Technical Meeting of the Satellite Division of the Institute of Navigation, ION GNSS 2016
20. 27th AAS/AIAA Space Flight Mechanics Meeting (2017), "On the Robust Attitude Regulation for Earth Observation Spacecraft Under Hybrid Actuation", (D. Pylorof, S. Bettadpur, and E. Bakolas), Advances in the Astronautical Sciences, v 160, p 2943-2960, 2017, Spaceflight Mechanics 2017.
21. ION GNSS 2018, "GNSS-based precise orbit determination of LEO satellites using un-differenced and double-differenced observations", (Z. Kang, B. Tapley, and S. Bettadpur), Proceedings of the 31st International Technical Meeting of the Satellite Division of the Institute of Navigation, ION GNSS+ 2018, p 1290-1298, 2018.
22. McArdle, S., Russell, R. P., and Bettadpur, S., "A Practical Method for Truncating Spherical Harmonic Gravity Fields, Application at the Moon," Paper AAS 20-048, AAS Guidance, Navigation, and Control Conference, Breckenridge, CO, Jan 2020.

Other Major Publications

1. National Academies of Sciences, Engineering, and Medicine 2020, (peer reviewed) **Evolving the Geodetic Infrastructure to Meet New Scientific Needs**, Washington, DC: The National Academies Press.
<https://doi.org/10.17226/25579>.
2. NASA/ESA Interagency Gravity Science Working Group (IGSWG 2016), *Towards a sustained observing system for mass transport to understand global change and to benefit society*, TUD-IGSWG-2016-01.

Books (Authored/Co-Authored, Edited/Co-Edited)

Book Chapters (Authored/Co-Authored, Edited/Co-Edited)

1. Global Geodetic Observing System, H.-P. Plag and M. Pearlman (Eds), Chapter-2 “The goals, achievements and tools of modern geodesy,” (H.-P. Plag et al.), Springer Verlag 2009.
2. Earth System Monitoring: Selected Entries from the Encyclopedia of Sustainability Science and Technology, J. Orcutt (Ed), Chapter-7 “Gravity Recovery and Climate Experiment (GRACE): Detection of Ice Mass Loss, Terrestrial Mass Changes, and Ocean Mass Gains,” (Zlotnicki, Bettadpur, Landerer & Watkins), Springer 2013.
3. Global Gravity Field Modeling From Satellite-to-Satellite Tracking, M. Naeimi and J. Flury (Eds), Chapter-3, “The Classical Variational Approach,” (Bettadpur & McCullough), Springer 2016.
4. Satellite Altimetry Over Oceans and Land Surfaces, D. Stammer and A. Cazenave (Eds), Chapter-5 “Auxiliary Space-Based Systems for Interpreting Satellite Altimetry: Satellite Gravity,” (Chambers, Andersen, Bettadpur, Rio, Rummel, and Wiese), CRC Press, 2017.

Oral Presentations: (speaker underlined, graduate student presenter italicized)

1. IGARSS 2023, S. Chiow, et al. “Quantum gravity gradiometry for mass change studies – State of the art and outlook”, paper TU2.R14.1, Pasadena, CA, July 2023.
2. Entries from EGU 2023
3. Entries from AGU 2022
4. Entries from EGU 2022
5. Symposium in Memory of Pierre Touboul, ONERA France, Dec 7, 2021 – presentation “The remote sensing of the gravity field and mass change for climate and the environment”, remote presentation.
6. AGU Fall Meeting 2021: E. Hasan, H. Save, M. Tamisiea, S. Bettadpur, “Beyond the basin scale: How GRACE terrestrial water storage evolves in space,” paper H21-A03, New Orleans, Dec 2021.
7. AGU Fall Meeting 2021: B. Krichman, S. Bettadpur, T. Pekker, “Assessment of land surface and atmospheric model mass flux using water balance techniques and GRACE/GRACE-FO data”, paper G31-A02, New Orleans, Dec 2021.
8. AGU Fall Meeting 2021: S. Bettadpur, M. Rosen, F. Wang, G. Jacob, S.-W. Chiow, N. Yu, “Hybrid SST and QGG configuration for mitigation of aliasing error and gravity field improvement – A simulation and technical trade study,” paper G12-A07, New Orleans, Dec 2021.
9. IAG Scientific Assembly 2021: J. Rivera, S. Bettadpur, J. Griffin, “Demonstration of 1 mm Precision for Kilometer Co-location Ties at McDonald Geodetic Observatory”, online, June 28-July 2, 2021.
10. EGU General Assembly 2021: Rosen, M., Bettadpur, S., Chiow, S., and Yu, N.: Hybrid Architectures with Quantum Gravity Gradiometry and Satellite-to-Satellite Tracking for Spaceborne Mass Change Measurements - A Sensitivity and Performance Analysis, online, 19–30 Apr 2021, EGU21-6730, <https://doi.org/10.5194/egusphere-egu21-6730>, 2021.
11. AGU Fall Meeting 2020 (**Invited**): S. Bettadpur, M. Rosen, S. Chiow, and N. Yu, “Hybrid architectures with quantum gravity gradiometry and satellite-to-satellite for spaceborne mass change measurements – A sensitivity and performance analysis,” paper G014-05, online Dec 2020.
12. AGU Fall Meeting 2020: M. Tamisiea, H. Save, S. Poole, Z. Kang, and S. Bettadpur, “Hydrological information in rapid, 21-day Quick-Look GRACE-FO solutions”, paper IN038-08, online Dec 2020.
13. AGU Fall Meeting 2020: F. Landerer, F. Flechtner, H. Save, C. McCullough, T. Bandikova, C. Dahle, S. Bettadpur, M. Watkins, and R. Gaston, “GRACE-FO Science results and mission status,” paper G020-01, online Dec 2020.
14. EGU General Assembly 2020: Flechtner, F., Landerer, F., Save, H., Dahle, C., Bettadpur, S., Watkins, M., and Webb, F.: NASA and GFZ GRACE Follow-On Mission: Status, Science, Advances, EGU General Assembly 2020, Online, 4–8 May 2020, EGU2020-3077, <https://doi.org/10.5194/egusphere-egu2020-3077>, 2020

15. AGU Fall Meeting 2019: Pie, Save, Nagel, Poole, Bettadpur, "New estimation strategies for laser ranging interferometer time-variable gravity fields," paper G44A-02, San Francisco, Dec 2019.
16. AGU Fall Meeting 2019: Save, Bettadpur, Poole, Tamisiea, Pie, Nagel, "Daily swath solutions from GRACE and GRACE-FO: Using range-rate versus range-acceleration SST data," paper G44A-04, San Francisco, Dec 2019.
17. AGU Fall Meeting 2019: Rodell, Getirana, Lee, Beaudoin, Zaitchik, Kumar, Arsenault, Save, Bettadpur, Wardow, Zamora, "Application of GRACE-FO data assimilation for monitoring and forecasting wetness conditions and drought," paper H31F-08, San Francisco, Dec 2019.
18. IUGG 27th General Assembly 2019: Bettadpur, Save, Pie, Poole, Nagel, "Exploration of variational methods for gravity field estimation for GRACE and GRACE Follow-On missions," paper IUGG19-3989, Montreal, Canada, July 2019.
19. IUGG 27th General Assembly 2019: Tapley, Flechtner, Bettadpur, Save, Boening, Watkins, "Further plans for the GRACE mission," paper IUGG19-3502, Montreal, Canada, July 2019.
20. IUGG 27th General Assembly 2019: Landerer, Flechtner, Webb, Dahle, Save, Watkins, Bettadpur, Morton, "GRACE Follow-On: First mass change observations and mission status," paper IUGG19-3571, Montreal, Canada, July 2019.
21. IUGG 27th General Assembly 2019: Save, Bettadpur, Pie, Nagel, Poole, Kang, "From GRACE to GRACE-FO: Continuity with CSR RL06 mascon solutions," IUGG19-4602, Montreal, Canada, July 2019.
22. IUGG 27th General Assembly 2019: Pie, Save, Nagel, Poole, Bettadpur, "Novel use of GRACE-FO laser ranging interferometer for the estimation of time-variable gravity field," paper IUGG19-4579, Montreal, Canada, July 2019.
23. EGU General Assembly 2019: Landerer, Dahle, Webb, Flechtner, Save, Wiese, McCullough, Yuan, Bettadpur, Murboeck, "Assessments of the first gravity and mass change fields from the GRACE Follow-On science data system," paper EGU2018-12596-3, Vienna, Austria May 2019.
24. EGU General Assembly 2019: Tapley, Flechtner, Bettadpur, Save, Boening, Watkins, "Further plans for the GRACE mission," paper EGU2019-6188, Vienna, Austria May 2019.
25. AGU Fall Meeting 2018: Rivera, Bettadpur, Ahmed, Ries, Griffin, "Framework for Measuring mm-Accurate Local Survey Ties over 1-km baselines at the McDonald Geodetic Observatory", paper G42A-07, Washington DC, Dec 2018.
26. AGU Fall Meeting 2018: Yunck, Saltman, Bettadpur, Nerem, Widner, Deccia, Veneziano, "Design For A Permanent Earth Gravitational Observatory", poster G13C-0556, Washington DC, Dec 2018.
27. AGU Fall Meeting 2018: Bettadpur, Save, Poole, Kang, Nagel, "Preliminary Assessments of GRACE-FO Gravity Fields And Continuity With GRACE Data", paper G23-A03, Washington DC, Dec 2018.
28. AGU Fall Meeting 2018: Webb, Bettadpur, Dahle, Flechtner, Landerer, Morton, Save, Watkins, "GRACE Follow-On: mission status, first results, and plans", paper G23A-02, Washington DC, Dec 2018.
29. GGHS 2018 (**Invited Keynote**): Srinivas Bettadpur, "From GRACE to GRACE Follow-On", Gravity Geoid and Height Systems, Copenhagen, Denmark, September 2018.
30. GGHS 2018: Landerer et al. 2018, "GRACE Follow-On: The next chapter of time variable gravity observations from space", Copenhagen, Denmark Sep 2018.
31. GGHS 2018: Meyer et al. 2018, "COST-G: The new international combination service for time-variable gravity field solutions of the IAG/IGFS", Copenhagen, Denmark Sep 2018.
32. EGU General Assembly 2018 (**Invited Paper**): Bettadpur, Shelus, Ries, Munton, Hughes, Wilson, Rempe, "The McDonald Geodetic Observatory (MGO)", EGU2018-9679, Vienna, Austria, April 2018.
33. EGU General Assembly 2018: Hakuba, Stephens, Webb, Bettadpur, Tapley, Christophe, Foulon, "Can we measure Earth's energy imbalance directly from space?" EGU2018-16063-1, Vienna, Austria, April 2018.
34. EGU General Assembly 2018: Tapley, Flechtner, Save, Bettadpur, Boening, Watkins, "Further Plans for the GRACE Mission", EGU2018-11176, Vienna, Austria, April 2018.
35. EGU General Assembly 2018: Save, Tapley, Bettadpur, "GRACE RL06 reprocessing and results from CSR", EGU2018-10697, Vienna, Austria, April 2018.
36. EGU General Assembly 2018: Flechtner, Dahle, Landerer, Webb, Watkins, Massmann, Bettadpur, "Current Mission Status and Next Steps", EGU2018-8990, Vienna, Austria, April 2018.
37. AGU Fall Meeting 2017: Tapley, Flechtner, Watkins, Bettadpur, "GRACE status at mission end", Paper G12C-01, New Orleans, Dec 2017.
38. AGU Fall Meeting 2017: Yunck, Saltman, Bettadpur, Nerem, Abel, "The Earth Gravitational Observatory (EGO): Nanosat constellations for gravity mapping", Paper G12C-01, New Orleans, Dec 2017.

39. IAG/IASPEI Joint Scientific Assembly 2017: Tapley, Flechtner, Watkins, Bettadpur, "Current status of the GRACE mission," G03-1-01, Kobe, Japan, August 2017.
40. IAG/IASPEI Joint Scientific Assembly 2017: Landerer, Flechtner, Webb, Watkins, Dahle, Bettadpur, "GRACE Follow-On: Overview and current mission status," G03-1-02, Kobe, Japan, August 2017.
41. EGU General Assembly 2017 (**Highlight Paper**): Flechtner, Webb, Watkins, Landerer, Dahle, Bettadpur, "Current Status Of The GRACE Follow-On Mission", EGU2017-4566, Vienna, Austria, April 2017.
42. SWARM 2017 and Geodetic Missions Workshop 2017: Tapley, Flechtner, Watkins, Boening, Bettadpur, "Status and Current Contributions of the GRACE Mission", Banff, Canada, March 2017.
43. AGU Fall General Assembly 2016: Tapley, B. Flechtner, F., Watkins, M., Boening, C. and S. Bettadpur, "GRACE Mission in the final stages", Paper G11C-01, San Francisco, Dec 2016.
44. AGU Fall General Assembly 2016: McCullough, C. and S. Bettadpur, "Improvements in GRACE gravity field determination through stochastic observation modeling," Paper G11C-04, San Francisco, Dec 2016.
45. AGU Fall General Assembly 2016 (**Invited**): Sultan, Mohamed, and 11 others, "Assessment of the hydrologic setting and mass transport within Saharan and Arabian Aquifers using GRACE, geochemical, geophysical and subsurface data," San Francisco, Dec 2016.
46. EGU General Assembly 2016 (**Vening-Meinesz Medal Lecture**): Bettadpur, S. "From GRACE to GRACE Follow-On and Beyond", Vienna, Austria Apr 2016.
47. EGU General Assembly 2016: Save, H. and S. Bettadpur, "Development of daily "swath" mascon solutions from GRACE", Vienna, Austria Apr 2016.
48. AGU Fall General Assembly 2015: Sakumura, C., S. Bettadpur, Z-L. Yang, H. Save and C. McCullough, "Establishing the framework for land data assimilation of GRACE terrestrial water storage information," Paper H53-L01, San Francisco, Dec 2015.
49. AGU Fall General Assembly 2015: Rodell, M., B. Zaitchik, A. Getirana, B. Li, S. Kumar, H. Beaudoin, H. Save and S. Bettadpur, "The potential for forecasting water cycle extremes with GRACE," Paper H42-D03, San Francisco, Dec 2015.
50. AGU Fall General Assembly 2015: Save, H. and S. Bettadpur, "Progress towards daily swath solutions from GRACE," Paper G41-B03, San Francisco, Dec 2015.
51. AGU Fall General Assembly 2015: Tapley, B.D., F. Flechtner, M. Watkins and S. Bettadpur, "The status and future directions for the GRACE mission," Paper G41-B02, San Francisco, Dec 2015.
52. IUGG General Assembly 2015: Bettadpur, S., J. Ries, R. Eanes, P. Nagel, S. Poole, T. Richter and H. Save, "The GGM05 Mean Earth gravity models," Paper IUGG-1364, Prague, Czech Republic, Jun 2015.
53. IUGG General Assembly 2015: Tapley, B., F. Flechtner, S. Bettadpur and M. Watkins, "The GRACE mission status and future directions," Paper IUGG-3084, Prague, Czech Republic, Jun 2015.
54. IUGG General Assembly 2015: Sakumura, C., S. Bettadpur, H. Save and C. McCullough, "A regularized sliding window time-variable gravity field from GRACE," Paper IUGG-1366, Prague, Czech Republic, Jun 2015.
55. EGU General Assembly 2015: Tapley, B., S. Bettadpur, F. Flechtner and M. Watkins, "Status and future directions for the GRACE mission," Paper EGU2015-7594, Vienna, Austria, April 2015.
56. EGU General Assembly 2015: Bettadpur, S., J. Ries, R. Eanes, P. Nagel, N. Pie, S. Poole, T. Richter, H. Save, "Evaluation of the GGM05 mean Earth gravity model," EGU2015-4153, Vienna, Austria, April 2015.
57. EGU General Assembly 2015: Save, H., S. Bettadpur and B. Tapley, "Evaluation of global equal-area mass grid solutions from GRACE," EGU2015-6747, Vienna, Austria, April 2015.
58. AGU Fall General Assembly 2014: Tapley, B., F. Flechtner, S. Bettadpur, and M. Watkins, The GRACE Mission Status and Future Activities", Paper G23-C03, San Francisco, Dec 2014.
59. AGU Fall General Assembly 2014 (**Invited**): Steckler, M., S. Noonan, S. Bettadpur, S. Akhter, S. Chowdhury, L. Seeber, "Recent Advances in Modeling Earth Deformation from Monsoonal Flooding in Bangladesh using Hydrographic, GPS and GRACE Data", Paper G41-C01, San Francisco, Dec 2014.
60. AGU Fall General Assembly 2014: Sakumura, C. and S. Bettadpur, "Data assimilation of GRACE terrestrial water storage information: solution assessment, error characterization and algorithmic procedure," Paper H13M-08, San Francisco, Dec 2014.
61. AGU Fall General Assembly 2014 (**Invited**): Wiese, D., S. Bettadpur, T. Gruber, P. Visser, M. Watkins, "Towards a Next Generation Gravity Field Mission," Paper G23C-08, San Francisco, Dec 2014.
62. GOCE 5th User Workshop 2014: Bettadpur, S., J. Ries, U. Ko, C. McCullough, P Nagel, N Pie, S Poole, T Richter, H Save and B Tapley, "GOCE and GGM05", Paris, Nov 2014.
63. COSPAR Assembly 2014 (**Invited**): Tapley, B., F. Flechtner, S. Bettadpur, M. Watkins, "The GRACE mission status and future directions," Paper PSD.1-0005-14, Moscow, Aug 2014.

64. AGU Fall General Assembly 2013: Save, H. and S. Bettadpur, "Using Tikhonov Regularization for Spatial Projections from CSR Regularized Spherical Harmonic GRACE Solutions," Paper G23A-06, San Francisco, Dec 2013.
65. AGU Fall General Assembly 2013: Tapley, B., F. Flechtner, S. Bettadpur and M. Watkins, "The Status and Future Prospect for GRACE After the First Decade," Paper G32A-01, San Francisco, Dec 2013.
66. Joint Penrose-Chapman Conference 2013, Coastal Processes and Environments Under Sea-Level Rise and Changing Climate: Science to Inform Management: S. Bettadpur, G. Wells, G. Jeffress and P. Tissot, "Remote Sensing Measurements for the Near- and Long-Term Characterization of the Sea Level Rise and Inundation Hazards Environment," Galveston, Apr 2013.
67. AGU Fall General Assembly 2012 (**Invited**): Wahr, J., V. Barletta, S. Bettadpur, R. Forsberg, M. Horwath, E. Ivins, S. Luthcke, E. Schrama, I. Velicogna, P. Whitehouse, "A group intercomparison of GRACE Antarctic and Greenland ice loss estimates, as part of the Ice Mass Balance Inter-comparison Exercise (IMBIE)," Paper G31C-03, San Francisco, Dec 2012.
68. AGU Fall General Assembly 2012 (**Invited**): Tamisiea, M., E. Leuliette, S. Bettadpur, S. Williams, V. Klemann, "Comparing geodetic observations to GIA models," Paper G23C-01, San Francisco, Dec 2012.
69. AGU Fall General Assembly 2012: Tapley, B., S. Bettadpur, F. Flechtner and M. Watkins, "The Status of GRACE After the First Decade," Paper G31C-01, San Francisco, Dec 2012.
70. AGU Fall General Assembly 2012: Bettadpur, S. and CSR Level-2 Team, "Assessment of GRACE mission performance and the RL05 gravity fields," Paper G31C-02, San Francisco, Dec 2012.
71. AGU (2012) Chapman Conference on the Remote Sensing of the Terrestrial Water Cycle: S. Bettadpur, "The status of GRACE mass flux measurements," paper GM-6, Waikoloa HI, Feb 2012.
72. EGU General Assembly 2012: S. Bettadpur and CSR L-2 Team, "Insights into the Earth System mass variability from CSR-RL05 GRACE gravity fields," Geophysical Research Abstracts, Vol 14, EGU2012-6409, EGU General Assembly 2012, Vienna, Austria, April 2012.
73. COSPAR General Assembly 2012: S. Bettadpur, "GRACE Mission Status and Future Developments," Mysore, July 2012.
74. AOGS-AGU (WPGS) Joint Assembly 2012: S. Bettadpur, B. Tapley, F. Flechtner and M. Watkins, "GRACE Mission Status, Recent Results and Future Prospects," Singapore, August 2012.

RESEARCH TOPICS

Space Geodesy, and determination and interpretation of Earth's shape, orientation and gravity field; Earth System Science and the modeling and interpretation of global mass flux variations; Applied Orbital Mechanics, Perturbations, and Orbit Determination using laser and radiometric ranging to satellites, and their applications to Precise Orbit Determination and Space Geodesy; Space mission design, mission architecture development for science applications; Data analytics and numerical methods.

CONSULTING:

CONTINUING EDUCATION:

Spring 2019 UT Executive Management and Leadership Program, UT McCombs School of Business.

ADDITIONAL TEACHING ACTIVITIES:

1. CSE Summer Scholars, Louis Stokes Alliance Mentoring Program:
 - a. Serrano, Cassandra (UTEP), Summer 2017, "The Earth's radiation budget balance".
 - b. Cruz, Daniel (Tarrant County College), Summer 2016, "Review and literature survey of history of Inverse Theories".
 - c. Ingle, Marjorie (UTEP), Summer 2009.
2. Visiting Students:
 - a. de La Serve, Maylis Teyssendier, IGN France, Summer 2016, mm-Metrology at the MGO
 - b. Abdelmohsen, Kareem, Western Michigan University, 2016, Science from gravity fields
 - c. Kremp, Mathilde, IGN France, Summer 2017, mm-Metrology at the MGO
 - d. Vijverberg, Jasper, TU Delft, Fall 2011, Modeling of non-gravitational forces on satellites.
3. Mentored ASE/EM Team in NASA/Micro-g NExT Design Competition, AY 2017-2018. Project on tie-cutter was designed, fabricated, and successfully tested in the JSC Neutral Buoyancy Lab in June 2018.
4. Undergraduate Research Assistants: 3 in AY 2022-2023.

5. Regular contributions (lecturing and judging) to student groups: e.g. ASE/EM FIG, UT POSSE; and UT GAIN programs.

PH.D. SUPERVISIONS COMPLETED:

1. Krichman, Benjamin (August 2023), "Satellite gravity measurements as a benchmark for intercomparison of water balance methods and Earth System model performance."
2. (ex-Schutz, co-supervisor Catania/JSG) Felikson, Denis, Aug 2018, "Geometric controls on the inland extent of dynamic thinning for Greenland Ice Sheet outlet glaciers". [presently Research Scientist at NASA Goddard Space Flight Center]
3. McCullough, Christopher, May 2017, "Gravity field estimation for next generation satellite missions" [presently Navigation Engineer, Solar Systems Dynamics Group, Caltech/Jet Propulsion Laboratory].
4. Sakumura, Carly, May 2016, "The Framework for Satellite Gravity Data Assimilation into Land Surface Models" [presently Research & Development Scientist, (DigitalGlobe) Maxar Technologies].
5. (Co-Supervisor) Bonin, Jennifer, Sep 2010, "Improving the observation of time-variable gravity using GRACE RL04 data" [presently Scientific Research, College of Marine Sciences, University of South Florida].
6. (Co-Supervisor) Save, Himanshu, May 2009, "Using Regularization for Error Reduction in GRACE Gravity Estimation" [presently Research Scientist, Center for Space Research, UT Austin].

M.S. SUPERVISIONS COMPLETED:

1. Zinni, Alexis, Aug 2022, "Inclusion of Second Order Information in the Variational Equations and Batch Least Squares Estimator"
2. Rosen, Mitchell, Aug 2021, "Analysis of Hybrid Satellite-to-Satellite Tracking and Quantum Gravity Gradiometry Architecture for Time-Variable Gravity Sensing Missions"
3. Smith, Matthew, Dec 2018, "Utilization of simulated GRACE inter-satellite range-accelerations to estimate Earth's gravity field".
4. Köhne, Tobias, Aug 2018, "A simulation study towards local mass estimation using GRACE data".
5. Widner, Max, Aug 2018, "Expected improvements in modeling Earth's gravity field using multiple GRACE-like satellite constellations".
6. Wolfenbarger, Natalie, May 2017, "Characterization of star tracker distortion for the ICESat mission".
7. King, Jennifer, May 2017, "Investigation of a non-orthogonal gyroscope model for ICESat-2"
8. Fulcher, Ryan, (ME) Summer 2016, "Temperature Fluctuation Analysis for GRACE Twin Satellites"
9. McWilliams, Hannah, Fall 2015, "Validating the 1-cm orbit"
10. McCandless, Sarah Elizabeth, Summer 2014, "Utilizing GRACE TWS, NDVI and Precipitation for drought identification and classification in Texas".
11. Sakumura, Carly, Summer 2012 "An ensemble solution for the Earth's time-varying gravitational field from the NASA/DLR GRACE mission".
12. McCullough, Christopher, Spring 2012 "Numerical integration accuracy and modeling for future geodetic missions"
13. Pini, Alex, Fall 2012, "Investigation of the effect of repeat orbits on GRACE gravity recovery"
14. Krishnan, Sandeep, Fall 2012, "Assessment of Numerical Differentiation Methods for Kinematic Orbit Solutions of the GRACE Mission"
15. Benegalrao, Suyog, Summer 2012, "Performance characterization of the attitude control system for the GRACE mission".

PH.D. SUPERVISION IN PROGRESS:

Skeens, Joseph [Candidate August 2023]

Spence, Cameron [Started Fall 2021]

Saadat, Niussha [Started Fall 2020]

Childress, Nicholas [Started Fall 2016], "Modeling non-linear ocean tides for gravity field estimation"

Rivera, Jullian [Candidate June 2021, Started Fall 2016], "Terrestrial reference frames for next generation sea-level and PNT applications"

Jacob, Geethu [Candidate Dec 2020; Started Fall 2016], "Innovation with regularization methods for solving inverse problems in gravity field estimation"

Vassallo, Corinne [PhD candidate in Dept. Geological Sciences, co-supervisor Clark Wilson (DGS), Started Fall 2014], “Innovation with machine learning for characterizing flood potential and drought onset from mass-change observations”

M.S. SUPERVISION IN PROGRESS:

OTHER STUDENT RESEARCH COMMITTEES:

Ph.D. Committees – 1 in AY22-23 (34 overall)

1. Torlak, Murat (1999/12) ECE - Xu & Evans (Estimation and capacity of channels in smart-antenna wireless communication system.)
2. Kavak, Adnan (2000/05) ECE - Supervisor Xu & Evans (Vector propagation channel studies for smart antenna wireless communication systems.)
3. Kim, Jeong-Rae (2000/05) ASE/EM - Supervisor Tapley (Simulation Study of a Low-Low Satellite-to-Satellite Tracking Mission.)
4. Mao, Jen-Hao (2000/08) ASE/EM - Supervisor Schutz (New algorithm for on-the-fly ambiguity resolution of real-time differential GPS positioning.)
5. Demarest, Peter (2001/05) ASE/EM - Supervisor Schutz (Strategies for the maintenance of satellite ground tracks.)
6. Magruder, Lori (2001/12) ASE/EM - Supervisor Schutz (Pointing angle and timing verification of the Geoscience Laser Altimeter using a ground-based detection system.)
7. Roessett, Peter (2003/12) ASE/EM - Supervisor Tapley (A Simulation Study of the Use of Accelerometer Data in the GRACE Mission.)
8. Wang, Furun (2003/12) ASE/EM - Supervisor Tapley (A Study on Center of Mass Calibration and K-band Ranging System Calibration of the GRACE Mission.)
9. Hinga, Mark (2004/12) ASE/EM - Supervisor Tapley (Using Parallel Computation to apply the Singular Value Decomposition (SVD) in solving for Large Earth Gravity Fields based on Satellite Data)
10. Thompson, Paul (2004/12) ASE/EM - Supervisor Tapley (Interpreting the Earth's Time Varying Geopotential as Observed From Space and Comparisons to Global Models of Hydrologic Transport.)
11. Gunter, Brian (2004/12) ASE/EM - Supervisor Tapley (Computational Methods and Processing Strategies for Estimating Earth's Gravity Field.)
12. Ko, Ung-Dai (2008/08) ASE/EM - Supervisor Tapley (Analysis of the Characteristics of the GRACE Dual One-Way Ranging System.)
13. Pie, Nadège (2008/12) ASE/EM - Supervisor Schutz (Mission design concepts for repeat groundtrack orbits and application to the ICESat mission.)
14. Bonin, Jennifer (2010/12) ASE/EM - Supervisor Tapley (Improving the Observation of Time-Variable Gravity Using GRACE RL04 Data.)
15. Wiese, David (2011/05) CU Boulder ASE - Supervisor Nerem (Optimizing Two Pairs of GRACE-like Satellites For Recovering Temporal Gravity Variations.)
16. Thakur, Divya (2014/08) ASE/EM - Supervisor Akella (Adaptation, Gyro-Free Stabilization, And Smooth Angular Velocity Observers For Attitude Tracking Control Applications.)
17. Gamble, Katherine (2015/05) ASE/EM - Supervisor Lightsey (A Software Tool Suite for Small Satellite Risk Management.)
18. Bhatti, Jahshan (2015/05) ASE/EM - Supervisor Humphreys (Sensor deception detection and radio-frequency emitter localization.)
19. Lantukh, Demyan (2015/08) ASE/EM - Supervisor who? (Preliminary Design of Spacecraft Trajectories for Missions to Outer Planets and Small Bodies.)
20. Brennan, Martin (2015/05) ASE/EM - Supervisor Fowler (?) (Preliminary Interplanetary Trajectory Design Tools using Ballistic and Powered Gravity Assists.)
21. Vittaldev, Vivek (2015/12) ASE/EM - Supervisor Russell (Uncertainty propagation and conjunction assessment for resident space objects.)
22. Olson, Corwin (2016/08) ASE/EM - Supervisor Russell (Sequential Estimation Methods for Small Body Optical Navigation.)

23. Hatten, Noble (2016/12) ASE/EM - Supervisor Lightsey (Space object translational and rotational state prediction and sensitivity calculation.)
24. Biria, Ashley (2017/08) ASE/EM - Supervisor Russell (Revisiting Vinti Theory: Generalized Equinoctial Elements and Applications to Spacecraft Relative Motion.)
25. Restrepo, Ricardo (2018/08) ASE/EM - Supervisor Russell (Patched Periodic Orbits: A Systematic Strategy for Low-Energy Trajectory and Moon Tour Design)
26. Bokelman, Kevin (2018/08) ASE/EM - Supervisor Russell (Exploration and optimization of low-energy capture options at Jovian moons.)
27. Wittick, Patrick (2020/08) ASE/EM - Supervisor Russell (Hybrid Discrete-Element Gravity Models For Small Celestial Bodies.)
28. Brown, Aaron (2022/05) ASE/EM - Supervisor Jones (Low-Earth Orbit Trajectory Optimization in the Presence of Atmospheric Uncertainty.)
29. Giuliani, Simone (2022/12) ASE/EM - Supervisor Tapley (Theory and Application of Extremely Precise Frequency Standards on Low Earth Orbit to the Determination of Geopotential Time-Variability.)
30. Staniewicz, Scott (2022/08) ASE/EM - Supervisor Chen (Surface Deformation Mapping and Automatic Feature Detection Over The Permian Basin Using InSAR.)
31. McArdle, Sean (2022/08) ASE/EM - Supervisor Russell (Gravity Modeling for Lunar Orbits).
32. Fear, Andrew (2023/05) Georgia Tech ASE - Supervisor Lightsey
33. Wu, Sophy (2023/06) ASE/EM – Supervisor Chen (Determining Soil Water and Soil Organic Carbon Storage Patterns using InSAR in the Arctic Foothills, Alaska).
34. Wang, Ke (2023/08) ASE/EM – Supervisor Chen (Application of Satellite Radar Interferometry to the study of Future Storm Risks along the Gulf Coast).

M.S. Reader – 0 in AY 22-23 (10 overall)

1. Currell, Philip (1998/05) ASE/EM - Supervisor Nerem (GRACE Orbit Analysis Tool and Parametric Analysis.)
2. Courtney, David (2001/05) ASE/EM - Supervisor Fowler (A simulation study of simultaneous multiple low-satellite GPS double differencing for orbit determination.)
3. Roundhill, Ian (2001/12) ASE/EM - Supervisor Tapley (The Use of a Single Accelerometer for a Dual Satellite Gravity Mission.)
4. Mauldin, Jeffrey (2003/12) ASE/EM - Supervisor Fowler (The Design and Implementation of the GRACE Operations Laboratory.)
5. Hudson, Danya (2003/12) ASE/EM - Supervisor Tapley (In-flight characterization and calibration of the SuperSTAR accelerometer.)
6. Save, Himanshu (2005/12) ASE/EM - Supervisor Tapley (Analysis of Dual Satellite TPS High-Low DD Observations for GRACE.)
7. Bonin, Jennifer (2006/05) ASE/EM - Supervisor Tapley (Improvements to GRACE Data Processing Using Tabular Input Background Models: Case Study of Ocean Tides.)
8. Stephens, Yvonne (2008/05) ASE/EM - Supervisor Fowler (The Geodesy Connection Project.)
9. Kolensky, Shannon (2012/05) - Supervisor Schutz (A Study of Time-Varying Geopotential Models for ICESat Precision Orbit Determination.)
10. Lu, Jason Y. (2014/05) - Supervisor Fowler (Uranus orbiter and probe mission: Project Upsilon.)

POST DOCTORAL FELLOW SUPERVISION:

[Included within count of scientific staff under “OTHER RESEARCH SUPERVISION” below]

OTHER RESEARCH SUPERVISION:

1. CSE Undergraduate Honors Thesis
 - a. Champion, Kaylee (ASE/EM), Spring 2021, “Lorentz force perturbations on non-spherical spacecraft’s orbits”.
 - b. Hillman, Kyle (ASE/EM), Spring 2018, “Comparison of Current Gravity Estimation and Determination Models”.

- c. Clawson, Jan (ASE/EM), Fall 2010, “Orbital Perturbations on a Large Space-Based Power Array in Geostationary Orbits”.
- 2. TexasView Undergraduate Research:
 - a. Jacobs, Riley (ASE/EM), Fall 2020 “Integration and joint interpretation of mass change with other remote sensing data in the Google Earth Engine”
 - b. Paranjape, Ishan (ASE/EM), Spring 2019, “Analyzing Vegetation Recovery from the Bastrop County Complex Fire Through Remote Sensing”.
 - c. Prakash, Supraj (ASE/EM), Spring 2016, “Biodiversity Response to Industrialization and Human Expansion as seen in Land Cover Change within the Western Ghats in the Hassan District”.

Research supervision and direction of scientific staff at CSR funded on own contracts/grants

2022-2023:	7 FTE Research/Technical Staff
2021-2022:	15 FTE Research/Technical Staff
2020-2021:	10 FTE Research/Technical Staff
2019-2020:	15+ FTE Research/Technical Staff
2018-2019:	16 FTE Research/Technical Staff
2017-2018:	19 FTE Research/Technical Staff
2016-2017:	12 FTE (18 personnel) Research/Technical Staff
2015-2016:	7 FTE (14 personnel) Research/Technical Staff
2014-2015:	4 FTE (12 personnel) Research/Technical Staff
2013-2014:	8 Full-time Equivalent Research/Technical Staff on GRACE Mission funds