

# Laramie V. Potts

Assistant Professor  
Dept. Engineering Technology  
New Jersey Institute of Technology  
2101 Guttenberg Information Technologies Center  
University Heights, Newark  
New Jersey 07102-1982  
phone: (973) 596-8191, fax: (973) 642-4184  
lpotts.njit.edu

## EDUCATION

- 2000: Ph.D** The Ohio State University, (OSU) Columbus OH, USA.  
**1993: M.Sc Geodetic Science and Surveying**, OSU, Columbus OH, USA.  
**1986: Licensed - Professional Land Surveyor**, Institute of Professional Land Surveyors and Technical Surveyors of South Africa.  
**1984: B.Sc Land Surveying**, University of Cape Town, South Africa.

## RESEARCH INTEREST

- \* **Geophysical Geodesy**: Deformation, Isostasy, and Tectonics.
- \* **Morphometrics**: Multi-scale derivatives for source delineation.
- \* **Space Weather**: Study external field variations for structures and dynamics of ionospheric TEC and magnetospheric-ionospheric coupling from GPS data and satellite magnetics.
- \* **Planetary Science**: Comparative mass variation models from topography, gravity, magnetics, and multi-spectral imagery of the Moon, Mars, Venus, and Mercury. Objective is to understand divergent planetary evolution and to search for terrestrial analogues.

## ACADEMIC POSITIONS

- 2006 - Assistant Professor, Engineering Technology, New Jersey Institute of Technology**
- 2006.5 - 2006.75 : Lecturer, Department of Earth Sciences, OSU.** *Earth's Dynamic Systems.*
- 2000 - 2006.5: Post Doctoral Researcher, Lab. Space Geodesy and Remote Sensing, OSU.** *Ionospheric modeling, GIA, Gravity-inferred mass variation modeling, Waveform retracking, Wavelets.*
- 1989-1991: Graduate Research Associate, Dept. Geodetic Science and Surveying, OSU.** *Geodetic control for OSU campus mapping project.*
- 1994-1997: Graduate Administrative Assistant, Dept. of Physical Facilities, OSU.** *Map digitization & Surveying for OSU campus project.*
- 1997-2000: Graduate Research Associate, Center for Mapping, OSU.** *Develop database and Geographical Information System (GIS) for OSU campus mapping project. Image classification for OhioView.*
- 1991-1994: Graduate Teaching Assistant** *Geodetic Control Surveys, Surveying with Satellites, Astronomy.*

## SYNERGISM

Review journal articles submitted to Science, Meteoritics and Planetary Science (MAPS), and IEEE Geosciences and Remote Sensing Letter (GRSL)

Seminar in Geodesy and Earth Sciences (OSU): Organize bi-weekly seminars for students and visiting scholars/scientists. Laboratory for Space Geodesy and Remote Sensing.

## FUNDING HISTORY

- ◇ **Collaborative Research: Space Weather: Wavelet Based Regional Multi-Resolution Ionosphere Modeling: Investigating Structure of the Equatorial Anomaly (Co-I)**, NSF - ATM # 0418844, Date: 07/27/2004 - 01/16/2008; \$482,571.00 Program Manager: Robert B. Kerr.
- ◇ **Polar Magnetic Properties and Mass Dynamics from Ørsted and Champ Satellite Geopotential Observations (Co-I)**, NSF - ANT # 0338005 Date: 05/26/2004 - 06/03/2006; \$205,000.00, Program Manager: Thomas P. Wagner.
- ◇ **Collaborative Research: CMG: Multi-Resolution Inversion of Tectonically Driven Spatio-Temporal Gravity Signals Using Wavelets and Satellite Data (Co-I)**, NSF - EAR # 0327633, Date: 08/20/2003 -02/20/2007; \$558,971.00, Program Manager: Robin Reichlin.

## PROFESSIONAL EXPERIENCE

**1986-1989: Professional Land Surveyor**, Cliff Harvey and Partners, Durban, South Africa.

## PUBLICATIONS

- Leftwich T., R. von Frese, **L. V. Potts**, H.-R. Kim, D. Roman, P. Taylor, and M. Barton, Crustal Modeling of the North Atlantic from Spectrally Correlated Free-air and Terrain Gravity, *Journal of Geodynamics* (40), 23-50, 2005.
- Potts, L. V.** and R. von Frese. Impact induced mass flow effects on lunar shape and the elevation dependence of nearside maria with longitude. *Physics of the Earth and Planetary Interiors Special issue: Studies of the Earth's Deep Interior* Eds: B.L.N. Kennett, E.J. Garnero and D.E. Loper, 2005
- Potts, L. V.**, O. Akyilmaz, A. Braun, C. K. Shum. Multi-resolution Dune Morphology from Shuttle Radar Topography Mission (SRTM) and Dune Deformation from Fuzzy Inference Systems using SRTM and Altimetric Data *Inter. Journal of Remote Sensing* [in-review].
- Mautz, R., J. Ping, K. Heki, B. Schaffrin, C. Shum, **L. V. Potts**. Efficient spatial and temporal representations of global ionosphere maps over Japan using B-spline wavelets *Journal of Geodesy*, DOI: 10.1007/s00190-004-0432-z, V78 (11-12), 662 - 667, 2005.
- Potts, L. V.**, C. K. Shum, R.R.B. von Frese, S-C. Han, R. Mautz. Recovery of Isostatic Topography over North America from CHAMP gravity and topography correlations, In: *Earth Observation with CHAMP: Results from Three Years in Orbit*, Ch. Reigber, H. Luehr, and P. Schwintzer, J. Wickert (Eds.), Geosciences Series (ISBN: 3-540-22804-7), 193-198, Springer-Verlag, Berlin, Heidelberg, 2005
- Taylor, P., K. Kis, R. von Frese, J. Korhonen, G. Wittmann, H. Kim, and **L. V. Potts**, Effect of varying crustal thickness on CHAMP geopotential data, In: *Earth Observation with CHAMP: Results from Three Years in Orbit*, Ch. Reigber, H. Luehr, and P. Schwintzer, J. Wickert (Eds.), Geosciences Series (ISBN: 3-540-22804-7), 111-117, Springer-Verlag, Berlin, Heidelberg, 2005.
- von Frese, R, **L. V. Potts**, T. E. Leftwich, H. R. Kim, S-C. Han, P. T. Taylor and M. F. Asgharzadeh, Satellite gravity drilling the Earth, *CHAMP-GRACE proceedings*, 2005 [in-review].
- von Frese, R, **L. V. Potts**, S. B. Wells, L. R. Gaya-Pique, A. V. Golynsky, O. Hernandez, J.-W. Kim, H. R. Kim, J. S. Hwuang, and P. T. Taylor, GRACE gravity data target possible mega-impact in north central Wilkes Land, Antarctica, *Nature*, 2005 [in-review].
- Ping, J., K. Matsumoto, K. Heki, A. Saito, P. Callahan, **L. V. Potts**, and C. Shum, Validation of Jason-1 nadir ionosphere TEC using Geonet. *Marine Geodesy*, 27, doi:10.1080/01490410490889049, 741-752, 2004.
- Potts, L. V.**, R. von Frese, T. Leftwich, P. Taylor, C. Shum, and R. Li, Gravity-inferred crustal attributes of visible and buried impact basins on Mars *Journal of Geophysical Research*, 109, doi:10.1029/2003JE002225, 2004.

- Potts L. V.**, and R. R. B. von Frese, Comprehensive mass modeling of the Moon from spectrally correlated free-air gravity and terrain gravity data, *Journal of Geophysical Research*, Vol 108(E4), 10.1029/2000JE001440, 2003a.
- Potts L. V.**, and R. R. B. von Frese, Crustal attributes of lunar basins from terrain-correlated free-air gravity anomalies, *Journal of Geophysical Research*, Vol 108(E5),10.1029/2000JE001446, 2003b.
- Potts L. V.**, and R. R. B. von Frese, C. K. Shum, Crustal properties of Mercury from a morphometric analysis of multi-ring basins on the Moon and Mars, *Meteoritics and Planetary Science*, 37, 1197-1207, 2002.
- R. R. B. von Frese, **Potts L. V.**, H. R. Kim, C. K. Shum, P. Taylor, J. W. Kim, and S. Han, CHAMP gravity anomalies over Antarctica, *1st CHAMP Science Meeting*, p15 GeoForschungZentrum Potsdam, 2002.
- Potts, L. V.**, Satellite Geophysical Investigation of the Moon, *OSU Report No. 458*, 2000.
- Leftwich T., R. von Frese, H.-R. Kim, **L. V. Potts**, D. Roman, and L. Tan, Crustal Analysis of Venus from Magellan Satellite Observations at Atalanta Planitia, Beta Regio and Thetis Regio, *Journal of Geophysical Research* No (E4), V (104), 1999.
- von Frese R., L. Tan, **L. V. Potts**, J. Kim, C. Merry, J. Bossler, Lunar Crustal Analysis of Mare Orientale from Topographic and Gravity Correlations, *Journal of Geophysical Research* No (E11), V (102), 1997.

#### **WORKSHOP & CONFERENCE PAPERS**

- Potts, L. V.**, M. Schmidt, C. K. Shum, R. von Frese, C. Zeilhofer, H.R. Kim Multi-resolution ionospheric electron density and external field over Antarctica altimetry and CHAMP magnetic observations, *EGU General Assembly*, EGU06-A-05525, Vienna, April 2-7. 2006.
- Schmidt, M., C. Shum, D. Bilitza, C. Zeilhofer, **L. Potts**, S. Ge, M. Karslioglu Regional multi-resolution representation of the ionospheric electron density *EGU General Assembly*, EGU06-A-05562, Vienna, April 2-7. 2006.
- Potts, L. V.**, L. Gaya-Pique, H.-R. Kim, R. von Frese, and C. K. Shum, Comparison of altimetry-derived ionosphere electron counts and CHAMP-measured External Field over Polar Regions, *EGU General Assembly*, EGU06-A-05010, Vienna, April 2-7. 2006.
- Potts, L. V.**, A. Braun, C. K. Shum, Morphology and migration of large sand dunes using SRTM and altimetric data, In *The Shuttle Radar Topography Mission - Data Validation and Applications Workshop*, Reston Virginia, 2005.
- Potts, L. V.**, X. Ge, M. Lai, C. Shum, A. Braun, Z. Lu, M. Schmidt, Multi Resolution 3D wavelets and splines for DEM representation and compression, In *The Shuttle Radar Topography Mission - Data Validation and Applications Workshop*, Reston Virginia, 2005.
- Potts, L. V.**, L. R. Gaya-Pique. H.-R. Kim, R. R. von Frese, S. Ge, Y. Yi, S. Wells, Comparison of magnetic activity and ionospheric total electron content in Polar regions, in *Eos Trans. AGU*, 86(18), Jt. Assem. Suppl., Abstract SH51B-09, 2005.
- Potts, L. V.**, C. K. Shum, S. Ge, D. Bilitza, T. Hobinger, H. Schuh, M. Schmidt, MURIM (Multi-Resolution Ionosphere Model): Preliminary results, In *Monitoring of the troposphere and ionosphere by space geodetic techniques*, EGU meeting. Vienna, Austria, 2005.
- Potts, L. V.**, O. Hernandez, M. Schmidt, R. von Frese, Architecture of the Andes Microplate, in *Eos Trans. AGU*, 86(18), Jt. Assem. Suppl., Abstract T43D-05, 2005.
- Wells, S B., R. R. von Frese, H. Kim, **L.V. Potts**, J. Kim, L. R. Gaya-Pique, Spectral Correlation of Antarctic Satellite Magnetic and Gravity Anomalies in *Eos Trans. AGU*, 86(18), Jt. Assem. Suppl., Abstract GP13A-03 2005.

- Potts, L. V.**, T. Leftwich, H.R. Kim, S.-C. Han, R. R. von Frese, Gravity drilling of mass differentiated planets, In *Lunar Planetary Science XXXIV*, Abstract # 1934 Lunar Planetary Institute, Houston, (CD-ROM), 2003.
- Potts, L. V.**, M. G. Schmidt, C. Shum, S. Ge, Wavelet based regional Multi-Resolution TEC Model, EGS -AGU - EUG Joint Assembly, Nice, France, April 2003.
- Taylor, P., K. Kis, R. von Frese, J. Korhonen, G. Wittmann, H. Kim, **L. V. Potts**, Effect of continental crust thickness variations on satellite-altitude geopotential anomalies, In *EGS - AGU - EUG Joint Assembly*, Nice, France, April 2003.
- Braun, A., C. K. Shum, **L. V. Potts**, C.-Y. Kuo, A. Trupin, Glacial isostatic adjustment in the Great Lakes region, In *EGS - AGU - EUG Joint Assembly*, Nice, France, April 2003.
- Leftwich, T., R. von Frese, **L. V. Potts**, D. Roman, P. Taylor, Crustal structure of the Iceland region from spectrally correlated free-air and terrain gravity data, EGS - AGU - EUG Joint Assembly, Nice, France, April 2003.
- Schmidt, M. G., **L. V. Potts**, R. Mautz, and C.K. Shum, Application of Spherical Wavelets to Meteorological and Space Weather Studies, In *Radio Occultation Science Workshop*, p 4.7. NCAR Foothills Laboratory Boulder, Colorado, 2002.
- Potts, L. V.**, T. Leftwich, and R. R. B. von Frese, Crustal Analysis of the Moon, Mars and Venus from Satellite Free-air Gravity and Terrain data, In *Weikko A. Heiskanen Symposium in Geodesy*, Abstract #93, Columbus Ohio USA, 2002.
- R. R. B. von Frese, H. R. Kim, T. Leftwich, **L. V. Potts**, Satellite Gravity Exploration of the Terrestrial Planets and the Moon, In *Weikko A. Heiskanen Symposium in Geodesy*, Abstract #60 Columbus Ohio, USA, 2002.
- Potts L. V.**, R. R. B. von Frese, C. K. Shum. Rheological inferences on the Mercurian crust from crater morphometric analyses of the Moon, Mars and Mercury. In *Workshop on Mercury Space Environment, Surface, and Interior*, p. 79 - 80. LPI Contribution No. 1097, Lunar and Planetary Institute, Houston. 2001.
- Leftwich, T. E, R. R. B. von Frese, H. R. Kim, H. C. Noltimier, **L. V. Potts**, D. Roman and L. Tan, Geopotential Constraints of the Structure and Development of Iceland and the Greenland-Scotland Ridge, In *Symposium on the Icelandic Plume and Crust*, (Abstract), National Science Foundation, 2001.
- Potts, L. V.**, and R. R. B. von Frese, Crustal structure of lunar impact basins from spectrally correlated gravity and topography data, In *Eos Trans. AGU 82*, Abstract S239, 2001.
- Potts, L. V.**, and R. R. B. von Frese, Lunar basin ring and transient cavity attributes from spectrally correlated free-air and terrain gravity data. In *Eos Trans. AGU 82*, Abstract S241, 2001.
- Potts, L. V.**, and R. R. B. von Frese, Martian mass differentiation from spectrally correlated free-air and topographic data. In *Eos Trans. AGU 82*, Abstract S248, 2001.
- von Frese R.R.B., **L. V. Potts**, Tan L., Kim J. W., Leftwich T. W., Merry C. J., Bossler, J. D., Comparative crustal modeling of the Moon and Earth from topographic and gravity correlations. Abstract # 1870 [CD-ROM], *29th Lunar Planet. Sci. Conf.*, 1998.
- von Frese R., Tan L., **L. V. Potts**, Kim J., Merry C., Bossler J., Lunar Crustal Modeling of Mare Orientale from Clementine Satellite Observations, *27th Lunar Planet. Sci. Conf.*, 1363-1364, 1996.