

Kurtis John Thome

**Educational background:**

University of Arizona PhD, Atmospheric Sciences	Dec. 1990
University of Arizona MS, Atmospheric Sciences	May 1989
Texas A & M University BS, Meteorology	May 1985

**Dissertation title:** *Radiative transfer model for a spherical atmosphere*

**Employment history:**

University of Arizona, Optical Sciences Center	Professor	2006 - Present
	Associate Professor	2000 - 2006
	Assistant Professor	1994 - 2000
	Assistant Research Scientist	1991 - 1994

**Professional society affiliations, activities, and honors:**

National Research Council, Committee on Earth Studies  
Landsat Continuity Project Working Group  
Landsat Calibration Science Team  
Landsat-7 Science Team  
ASTER Science Team  
Global Aerosol Climatology Project Science Team  
MODIS Science Team  
NPOES Preparatory Project Science Team  
Earth Observer-1 Science Team  
New Millennium Project, Earth Observer-1 Science Advisory Team  
University of Arizona Committee on Remote Sensing and Spatial Analysis  
University of Arizona Committee on Global Change  
American Geophysical Union  
American Meteorological Society  
IEEE Geosciences and Remote Sensing Society  
Optical Society of America  
Fellow, Society of Photo-Optical Instrumentation Engineers

**Current Research Activities:**

Current research activities include work in support of NASA's Earth Sciences Enterprise. I am currently a member of the Advanced Spaceborne Thermal Emission and Reflection radiometer (ASTER), MODerate-resolution Imaging Spectroradiometer (MODIS) Science Teams, and the NPOESS Preparatory Project (NPP) Science Team, and the Landsat Calibration Team. The work involves developing algorithms for the absolute radiometric calibration of these sensors and developing atmospheric correction schemes for ASTER in the solar reflective portion of the spectrum to derive surface reflectance from the satellite measurements.

Other interests include developing radiative transfer algorithms for remote sensing applications to more realistically model the scattering of light in the earth's atmosphere and improving ground-based methods for determining atmospheric constituents. This work is primarily

associated with using solar radiometer measurements to determine atmospheric water vapor and aerosol properties.

### **Teaching Activities:**

Optical Design and Instrumentation II (OPTI 509)- Graduate level course discussing optical systems via radiometric analysis by ray trace codes, ray fans, and spot diagrams. Radiometric concepts such as projected area and solid angle, generation and propagation of radiation, absorption, reflection, transmission and scattering, and radiometric laws such as inverse square and cosine laws. The effects of optical aberrations, both chromatic and monochromatic, and methods for balancing the effects of various aberrations are described. Radiometric analysis of and impact of aberrations on imaging systems.

Fundamentals of Remote Sensing (OPTI 450/550)- Combined Undergraduate/Graduate level course to introduce remote sensing, from the standpoint of the radiometry of optical systems; target reflectance and emission characteristics; and effects from intervening media such as the atmosphere. These tools are used to examine spectroradiometric instruments and satellite optical sensors.

Remote sensing for the study of planet Earth (OPTI 490/590)- Combined undergraduate and graduate level course intended to provide an in-depth review of the principles, techniques, and applications of remote sensing. The course gives students an introduction to the physical basis of electromagnetic remote sensing, the concepts and practices of information extraction, and a review of a wide range of applications pertinent to earth-systems science.

Image Processing Laboratory for Remote Sensing (ECE/OPTI 531) - Core course requirement for the Ph.D. minor program in Remote Sensing and Spatial Analysis describing techniques and applications of digital image processing in remote sensing, multispectral image enhancement and analysis, classification, feature extraction for cartography, and rule-based systems for mapping from imagery.

Remote sensing instrumentation and techniques (ECE 583) - Course that covers measurement, instrumentation, and signal conditioning techniques required for remote sensing applications in the optical to microwave wavelength range with emphasis on atmospheric remote sensing. The course examines examples of active and passive remote sensing applications such as visible, IR, and microwave radiometry, lidar, radar, and satellite experiments.

### **Publications:**

#### **Peer Reviewed:**

Teillet, P.M., G. Fedosejevs, K. Thome, J. L. Barker, "Impacts of spectral band difference effects on radiometric cross-calibration between satellite sensors in the solar-reflective spectral domain," *Remote Sensing of Environment*, **110**, pp.393-409, 2007

Cattrall, C., J. Reagan, K. Thome, and O. Dubovik, "Variability of aerosol and spectral lidar and backscatter and extinction ratios of key aerosol types derived from selected Aerosol Robotic Network locations," *J. Geophys. Res.*, **110**, D10211, doi:10.1029/2004JD005124, 2005.

Galbraith, A. E., J. Theiler, K. J. Thome, R. W. Ziolkowski, "Resolution enhancement of multilook imagery for the Multispectral Thermal Imager," *IEEE Trans. On Geosciences and Remote Sensing*, **43**, pp. 1964-1977, 2005.

- Yoshida, M., H. Murakami, Y. Mitomi, M. Hori, **K. J. Thome**, D. K. Clark, and H. Fukushima, "Vicarious calibration of GLI by ground observation data," *IEEE Trans. On Geosciences and Remote Sensing*, **43**, pp. 2167-2176, 2005.
- Thome, K. J., D. L. Helder, D. Aaron, and J. D. Dewald, "Landsat-5 TM and Landsat-7 ETM+ absolute radiometric calibration using the reflectance-based method," *IEEE Trans. On Geosciences and Remote Sensing*, **42**, pp. 2777-2785, 2004.
- Markham, B. L., K. J. Thome, J. A. Barsi, E. Kaita, D. L. Helder, J. L. Barker, and P. L. Scarmuzza, "Landsat-7 ETM+ on-orbit reflective band radiometric stability and absolute calibration," *IEEE Trans. On Geosciences and Remote Sensing*, **42**, pp. 2810-2820, 2004.
- Chander, G., D. L. Helder, B. L. Markham, J. D. Dewald, E. Kaita, K. J. Thome, E. Micijevic, and T. A. Ruggles, "Landsat-5 TM reflective band absolute radiometric calibration," *IEEE Trans. On Geosciences and Remote Sensing*, **42**, pp. 2747-2760, 2004.
- Teillet, P.M., D.L. Helder, T. A. Ruggles, F. J. Ahern, N. J. Higgs, J. Barsi, B.L. Markham, J.L. Barker, K.J. Thome, J.R. Schott, and F.D. Palluconi, "A definitive calibration record for the Landsat-5 Thematic Mapper anchored to the Landsat-7 radiometric scale," *Canadian J. of Rem. Sens.*, **30**, pp. 631-643, 2004.
- Thome, K. J., "In-flight intersensor radiometric calibration using vicarious approaches," *Post-Launch Calibration of Satellite Sensors*, Edited by S. A. Morain and A. M. Budge, Balkema Publishers, Philadelphia, pp. 93-102, 2004.
- Thome K. J., S. F. Biggar, W. T. Wisniewski, "Cross-comparison of EO-1 sensors and other Earth Resources Sensors to Landsat-7 ETM+ Using Railroad Valley Playa," *IEEE Trans. On Geosciences and Remote Sensing*, **41**, pp. 1180-1188, 2003.
- Biggar, S. F., K. J. Thome, W. T. Wisniewski, "Vicarious radiometric calibration of EO-1 sensors by reference to high-reflectance ground targets," *IEEE Trans. On Geosciences and Remote Sensing*, **41**, pp. 1174-1179, 2003.
- Bryant, R. , M. S. Moran, S. A. McElroy, C. D. Holifield, K. J. Thome, T. Miura, S. F. Biggar, "Data continuity of Earth Observing 1 (EO-1) Advanced Land Imager (ALI) and Landsat TM and ETM+," *IEEE Trans. On Geosciences and Remote Sensing*, **41**, pp. 1204-1213, 2003.
- Kuester, M. A., K. J. Thome, J. A. Reagan, "Automated statistical approach to Langley evaluation for a solar radiometer," *Applied Optics*, **42**, pp. 4914-4920, 2003.
- Pagnutti, M., R. E. Ryan, M. Kelly, K. Holekamp, V. Zanoni, K. Thome, S. Schiller, "Radiometric characterization of IKONOS multispectral imagery," *Remote Sensing of Environment*, **88**, pp. 53-68, 2003.

- Abdou, W. A., C. J., M. C. Helmlinger, J. E. Conel, S. H. Pilorsz, W. Ledebouer, B. J. Gaitley, K. J. Thome, "Vicarious calibration experiment in support of the Multi-angle Imaging Spectroradiometer," *IEEE Trans. On Geosciences and Remote Sensing*, **40**, pp. 1500-1511, 2002.
- Bruegge, C. J., N. L. Chrien, R. R. Ando, D. J. Diner, W. A. Abdou, M. C. Helmlinger, S. H. Pilorsz, K. J. Thome, "Early validation of the Multi-angle Imaging Spectroradiometer (MISR) radiometric scale," *IEEE Trans. On Geosciences and Remote Sensing*, **40**, pp. 1477-1492, 2002.
- Cattrall, C., K. L. Carder, K. J. Thome, H. R. Gordon, "Solar-reflectance-based calibration of spectral radiometers," *Geophysical Res. Letters*, **29**, 1941, doi:10.1029/2002GL015130, 2002.
- Thome, K. J., "Absolute radiometric calibration of Landsat-7 ETM+ using the reflectance-based method," *Remote Sensing of Environment*, **78**, pp. 27-38, 2001.
- Arai, K., K. Thome, S. Tsuchida, K. Maekawa, and H. Tonooka, "Early results from the vicarious calibration activities for ASTER/VNIR and SWIR in Japan," *Journal of the Remote Sensing Society of Japan*, **21**, pp. 431-439, 2001.
- Brown, S. W., B. C. Johnson, H. W. Yoon, J. J. Butler, R. A. Barnes, S. Biggar, P. Spyak, K. Thome, E. Zalewski, M. Helmlinger, C. Bruegge, S. Schiller, G. Fedosejevs, R. Gauthier, S. Tsuchida, and S. Machida, "Radiometric characterization of field radiometers in support of the 1997 Lunar Lake, Nevada experiment to determine surface reflectance and top-of-atmosphere radiance," *Remote Sensing of Environment*, **77**, pp. 367-376, 2001.
- Hook, S. J., J. J. Myers, K. J. Thome, M. Fitzgerald, A. B. Kahle, "The MODIS/ASTER airborne simulator (MASTER) - a new instrument for earth science studies," *Remote Sens. of Env.*, **76**, pp. 93-102, 2001
- Moran, M. S., R. Bryant, K. Thome, W. Ni, Y. Nouvellon, M. P. Gonzalez-Dugo, J. Qi, and T. R. Clarke, "A refined empirical line approach for reflectance factor retrieval from Landsat-5 TM and Landsat-7 ETM+," *Remote Sensing of Environment*, **78**, pp. 71-82, 2001.
- Nandy, P., K. Thome, and S. Biggar, "Characterization and field use of a CCD camera system for retrieval of bi-directional reflectance distribution function," *Journal of Geophysical Research*, **106**, pp. 11,957-11,966, 2001.
- Slater, P. N., S. F. Biggar, J. M. Palmer, and K. J. Thome, "Unified approach to absolute radiometric calibration in the solar-reflective range," *Remote Sensing of Environment*, **77**, pp. 293-303, 2001.

- Teillet, P. M., G. Fedosejevs, R. P. Gauthier, N. T. O'Neill, K. J. Thome, S. F. Biggar, H. Ripley, and A. Meygret, "A generalized approach to the vicarious calibration of multiple Earth observation sensors using hyperspectral data," *Remote Sensing of Environment*, **77**, pp. 304-327, 2001.
- Thome, K. J. and P. Nandy, "Accuracy of ground-reference calibration of imaging spectroradiometers at large sensor view angles", *Journal of Remote Sens. Soc. Of Japan*, **20**, pp. 112-124, 2000.
- Arai, K., K. J. Thome, "An error budget analysis of the vicarious calibration for visible to near infrared radiometers onboard satellites based on the reflectance based method" *Journal of Japan Society for Photogrammetry and Remote Sensing*, **39**, pp. 99-105, 2000.
- Arai, K., K. J. Thome, S. Tsuchida, T. Takashima, Y. Kawata, S. Machida, and H. Tonooka, "Field experiment in Tsukuba test site for ASTER vicarious calibration (visible to near-infrared and shortwave infrared radiometers)", *Journal of Remote Sens. Soc. Of Japan*, **20**, pp. 55-62, 2000.
- Barnes, R. A., R. E. Eplee Jr., S. F. Biggar, K. J. Thome, E. F. Zalewski, P. N. Slater, and A. W. Holmes, "SeaWiFS transfer-to-orbit experiment," *Applied Optics*, **39**, pp. 5620-5631, 2000.
- Privette, J. L., G. P. Asner, J. Conel, K. F. Huemmrich, R. Olson, A. Rango, A. F. Rahman, K. Thome, and E. A. Walter-Shea, "The EOS Prototype Validation Exercise (PROVE) at Jornada: overview and lessons learned," *Remote Sensing of Environment*, **74**, pp. 1-12, 2000.
- Thome, K., S. Schiller, J. Conel, K. Arai, and S. Tsuchida, "Results of the 1996 Earth Observing System vicarious calibration campaign at Lunar Lake Playa, Nevada (USA)," *Metrologia*, **35**, pp. 631-638, 1998
- Thome, K., K. Arai, S. Hook, H. Kieffer, H. Lang, T. Matsunaga, A. Ono, F. Palluconi, H. Sakuma, P. Slater, T. Takashima, H. Tonooka, S. Tsuchida, R. Welch, E. Zalewski, "ASTER preflight and in-flight calibration and the validation of Level 2 products," *IEEE Trans. On Geos. and Rem. Sens.*, **36**, pp. 1161-1172, 1998.
- Thome, K. J., F. P. Palluconi, T. Takashima, K. Masuda "Atmospheric correction of ASTER," *IEEE Trans. On Geos. and Rem. Sens.*, **36**, pp. 1199-1211, 1998.
- Sicard, M. K. J. Thome, B. G. Crowther, M. W. Smith, "Shortwave infrared spectroradiometer for atmospheric transmittance measurements," *J. of Atmos. and Oceanic Tech.*, **15**, pp. 174-183, 1998.

- Spyak, P. R., J. H. LaMarr, and K. J. Thome, "Atmospheric absorption in laboratory measurements: a comparison between MODTRAN3 and measurement," *Appl. Optics*, **37**, pp. 5797-5805, 1998.
- Thome, K. J., B. G. Crowther, S. F. Biggar, "Reflectance- and irradiance-based calibration of Landsat-5 Thematic Mapper, *Canadian J. of Rem. Sens.*, **23**, pp. 309-317, 1997.
- Thome, K. B. Markham, J. Barker, P. Slater, and S. Biggar, "Radiometric calibration of Landsat," *Photogramm. Eng. and Remote Sensing.*, **63**, pp. 853-858, 1997.
- Descour, M. R., C. E. Volin, E. L. Dereniak, K. J. Thome, A. B. Schumacher, D. W. Wilson, and P. D. Maker, "Demonstration of a high-speed non-scanning imaging spectrometer," *Optics Letters*, **22**, pp. 1271-1273, 1997.
- Schmid, B., K. Thome, P. Demoulin, R. Peter, C. Mätzler, and J. Sekler, "Comparison of modeled and empirical approaches for retrieving columnar water vapor from solar transmittance measurements in the 0.94- $\mu\text{m}$  region. *J. of Geophys. Res.*, **101**, pp. 9345-9358, 1996.
- Ono, A., F. Sakuma, K. Arai, Y. Yamaguchi, H. Fujisada, P. N. Slater, K. J. Thome, F. Palluconi, H. Kieffer, "Preflight and in-flight calibration plan for ASTER," *J. of Atmospheric and Oceanic Technology*, **13**, pp. 321-335, 1996.
- Ono, A., F. Sakuma, K. Arai, Y. Yamaguchi, H. Fujisada, P. N. Slater, K. J. Thome, F. Palluconi, H. Kieffer, "Preflight and in-flight calibration plan for ASTER," *Bulletin of NRLM*, **45**, pp. 376-386, 1996.
- Slater, P. N., S. F. Biggar, K. J. Thome, D. I. Gellman, and P. R. Spyak, "Vicarious radiometric calibrations of EOS sensors," *J. of Atmospheric and Oceanic Technology*, **13**, pp. 349-359, 1996.
- Herman, B. M., T. R. Caudill, D. E. Flittner, K. J. Thome, and A. Ben-David, "Comparison of the Gauss-Seidel spherical polarized radiative transfer code with other radiative transfer codes," *Appl. Optics*, **34**, pp. 4563-4572, 1995.
- Moran, M. S., R. D. Jackson, T. R. Clarke, J. Qi, F. Cabot, K. J. Thome, and B. L. Markham, "Reflectance factor retrieval from Landsat TM and SPOT HRV data for bright and dark targets," *Rem. Sens. of Environment*, **52**, pp. 218-230, 1995.
- Reagan, J., K. Thome, B. Herman, R. Stone, J. DeLuisi, and J. Snider, "A comparison of columnar water vapor retrievals obtained with near-IR solar radiometer and microwave radiometer measurements," *J. Appl. Meteorology*, **34**, pp. 1384-1391, 1995.

- Slater, P. N., K. J. Thome, K. Arai, H. Fujisada, H. H. Kieffer, A. Ono, F. Sakuma, F. D. Palluconi, and Y. Yamaguchi, "Radiometric calibration of ASTER data," *Japanese Journal of Remote Sensing*, **15**, pp. 16-23, 1995.
- Thome, K. J., M. W. Smith, J. M. Palmer, and J. A. Reagan, "Three-channel solar radiometer for determining atmospheric columnar water vapor," *Appl. Optics*, **33**, pp. 5811-5819, 1994.
- Herman, B. M., A. Ben-David, and K. J. Thome, "Numerical technique for solving the radiative transfer equation for a spherical-shell atmosphere," *Appl. Optics*, **33**, pp. 1760-1770, 1994.
- Flittner, D. E., B. M. Herman, K. J. Thome, J. M. Simpson, J. A. Reagan, "Total ozone and aerosol optical depths inferred from radiometric measurements in the Chappuis absorption band," *Journal of Atmospheric Sciences*, **50**, pp. 1113-1121, 1993.
- Thome, K. J., B. M. Herman, and J. A. Reagan, "Determination of precipitable water from solar transmission," *J. of Appl. Meteorology*, **31**, pp. 157-165, 1992.
- Reagan, J. A., K. J. Thome, and B. M. Herman, "A simple instrument and technique for measuring columnar water vapor via near-IR differential solar transmission measurements," *IEEE Transactions on Geoscience and Remote Sensing*, **30**, pp. 825-832, 1992.

#### **Conference Proceedings and Other Publications:**

- Thome, K., J. Czapla-Myers, J. McCorkel, "Retrieval of surface BRDF for reflectance-based calibration," *Proc. SPIE Vol. 6677*, San Diego, Calif., 2007.
- Anderson, N., S. Biggar, K. Thome, and N. Leisso, "Solar radiation-based calibration of laboratory grade radiometers," *Proc. SPIE Vol. 6677*, San Diego, Calif., 2007.
- Biggar, S. F., K. J. Thome, R. B. Lockwood, and S. Miller, "VNIR transfer radiometer for validation of calibration sources for hyperspectral sensors," *Proc. SPIE Vol. 6677*, San Diego, Calif., 2007.
- Czapla-Myers, J. S., K. J. Thome, J. H. Buchanan, "Implication of spatial uniformity on vicarious calibration using automated test sites," *Proc. SPIE Vol. 6677*, San Diego, Calif., 2007.
- Czapla-Myers, J. S., K. J. Thome, N. P. Leisso, "Calibration of AVHRR sensors using the reflectance-based method," *Proc. SPIE Vol. 6684*, San Diego, Calif., 2007.
- Leisso, N. P., K. J. Thome, J. S. Czapla-Myers, "Validation of the onboard radiometric calibration of GOES I-M visible channel by reflectance-based vicarious methods," *Proc. SPIE Vol. 6684*, San Diego, Calif., 2007.

- Teillet, P. M., J. A. Barsi, G. Chander, and K. J. Thome, "Prime candidate Earth targets for the post-launch radiometric calibration of space-based optical imaging instruments," *Proc. SPIE Vol. 6677*, San Diego, Calif., 2007.
- Thome, K., "Vicarious calibration of ASTER backward-looking telescope," *Proc. SPIE Vol. 6296*, San Diego, Calif., 629611, 2006.
- Thome, K., J. D'Amico, and C. Hugon, "Intercomparison of Terra ASTER, MISR, and MODIS, and Landsat-7 ETM+," *International Geoscience and Remote Sensing Symposium*, Denver, Colorado, 2006
- Dobler, J. and K. Thome, "Methods for validation of the on-orbit calibration of CALIOP and for establishing a bond with MODIS for enhancing future retrievals," *Proceedings 15<sup>th</sup> Annual CALCON Technical Conference*, Logan, Utah, 2005.
- Leisso, N. and K. Thome, "Effect of atmospheric characterization on the reflectance-based vicarious method of radiometric calibration of Landsat 7 ETM+," *Proceedings 15<sup>th</sup> Annual CALCON Technical Conference*, Logan, Utah, 2005.
- Buchanan, J. H., J. Dobler, K. Thome, S. Biggar, "Validation of a laser-based system for ground measurement of backscatter surface reflectance," *Proc. SPIE Vol. 6296*, San Diego, Calif., 629613, 2006.
- D'Amico, J., K. Thome, J. Czaplá-Myers, "Validation of large-footprint reflectance-based calibration using coincident MODIS and ASTER data," *Proc. SPIE Vol. 6296*, San Diego, Calif., 629612, 2006.
- Mahler, A., K. Thome, D. Yin, W. A. Sprigg, "Dust transport model validation using satellite- and ground-based methods in the southwestern United States," *Proc. SPIE Vol. 6299*, San Diego, Calif., 62990L, 2006.
- Markham, B. L., J. A. Barsi, D. L. Helder, K. J. Thome, J. L. Barker, "Evaluation of the Landsat-5 TM radiometric calibration history using desert test sites," *Proc. SPIE Vol. 6361*, San Diego, Calif., 63610V, 2006.
- McCorkel, J., K. Thome, S. Biggar, M. Kuester, "Radiometric calibration of Advanced Land Imager using reflectance-based results between 2001 and 2005," *Proc. SPIE Vol. 6296*, San Diego, Calif., 62960G, 2006.
- Thome, K., J. Czaplá-Myers, K. Scott, "Automated ground system for reflectance-based calibration," *Proceedings 14<sup>th</sup> Annual CALCON Technical Conference*, Logan, Utah, 2005.
- Thome, K. J., "Sampling and uncertainty issues in trending reflectance-based vicarious calibration results " *Proc. SPIE Conf. #5882*, San Diego, Calif., 2005.



- Thome, K. J., J. Geis, and C. Cattrall, "Comparisons of ground-reference calibration results for Landsat-7 ETM+ for large and small test sites," *Proc. SPIE Conf. #5882*, San Diego, Calif., 2005.
- Thome, K. J., C. Cattrall, J. D'Amico, and J. Geis, "Ground-reference calibration results for Landsat-7 ETM+," *Proc. SPIE Conf. #5882*, San Diego, Calif., 2005.
- Thome, K. J., "Solar radiometry studies of Tucson's Aspen Fire smoke," *Proc. of Workshop Remote Sensing of Atmospheric Aerosols*, pp. 26-31, Tucson, Arizona, 2005.
- Biggar, S. F., K. J. Thome, J. T. McCorkel, and J. M. D'Amico, "Vicarious calibration of the ASTER SWIR sensor including crosstalk correction," *Proc. SPIE Conf. #5882*, San Diego, Calif., 2005.
- Cattrall, C., J. Reagan, K. Thome, and X. Wang, "Further constraining space borne lidar aerosol retrievals using an independently determined Angstrom parameter," *Proc. of Workshop Remote Sensing of Atmospheric Aerosols*, Tucson, Arizona, 2005.
- Czapla-Myers, J. S., K. J. Thome, and S. F. Biggar, "Unmanned vicarious calibration of large-footprint sensors," *Proc. SPIE Conf. #5882*, San Diego, Calif., 2005.
- Hudspeth, W., S. Nickovic, D. Yin, B. Chandy, B. Barbaris, A. Budge, T. Budge, S. Baros, K. Benedict, C. Bales, C. Cattrall, S. Morain, G. Sanchez, W. Sprigg, and K. Thome, "PHAIRS - A public health decision support system: Initial results," *Proc. 31<sup>st</sup> International Symp. on Remote Sensing of Environment*, St. Petersburg, Russia, 2005.
- Wang, X., J. Reagan, C. Cattrall, K. Thome, "Spaceborne lidar aerosol retrieval approaches based on improved aerosol model constraints," *Proc. of Workshop Remote Sensing of Atmospheric Aerosols*, Tucson, Arizona, 2005.
- Thome, K., J. Czapla-Myers, S. Biggar, "Railroad Valley Playa for use in vicarious calibration of large footprint sensors," *Proc. of Workshop on Intercomparison of Large Scale Optical and Infrared Sensors*, Noordwijk, Netherlands, 2004.
- Thome, K., J. Reagan, J. Geis, M. Bolt, and J. Spinhirne, "Validation of GLAS calibration using ground- and satellite-based data," *International Geoscience and Remote Sensing Symposium*, pp. 2468-2471, Anchorage, Alaska, 2004.
- Biggar, S., K. Thome, J. Geis, and C. Burkhardt, "Laser-based system for ground measurement of backscatter surface reflectance," *International Geoscience and Remote Sensing Symposium*, pp. 1955-57, Anchorage, Alaska, 2004.

- Reagan, J. X. Wang, C. Cattrall, K. Thome, "Spaceborne lidar aerosol retrieval approaches based on aerosol model constraints," *International Geoscience and Remote Sensing Symposium*, pp. 1940-1943, Anchorage, Alaska, 2004.
- Thome, K., J. Czapla-Myers, and S. Biggar, "Ground-monitor radiometer system for vicarious calibration," *Proc. SPIE Conf. #5546*, pp. 223-232, Denver, Colo., 2004.
- Thome, K., S. Biggar, and H. J. Choi, "Vicarious calibration of Terra ASTER, MISR, and MODIS," *Proc. SPIE Conf. #5542*, pp. 290-299, Denver, Colo., 2004.
- Laurent, M., K. Thome, and C. Cattrall, "MODTRAN-based retrieval of column water vapor from solar transmittance," *Proc. SPIE Conf. #5546*, pp. 115-125, Denver, Colo., 2004.
- Scholl, J.F., K. J. Thome, and E. J. Dereniak, "Normalized difference vegetation index calculations from JPEG2000 compressed Landsat-7 images," *Proc. SPIE Conf. #5561*, pp. 84-95, Denver, Colo., 2004.
- Teillet, P. M., G. Fedosejevs, and K. J. Thome, "Spectral band difference effects on radiometric cross-calibration between multiple satellite sensors in the Landsat solar-reflective spectral domain," *Proc. of Workshop on Intercomparison of Large Scale Optical and Infrared Sensors*, Noordwijk, Netherlands, 2004.
- Teillet, P. M., G. Fedosejevs, and K. J. Thome, "Spectral band difference effects on radiometric cross-calibration between multiple satellite sensors in the Landsat solar-reflective spectral domain," *Proc. SPIE Conf. #5570*, pp. 307-316, Maspalomas, Spain, 2004.
- Thome K. J., J. Czapla-Myers, S. F. Biggar, "Vicarious calibration of Aqua and Terra MODIS," *Proc. SPIE Conf. #5151*, pp. 395-405, San Diego, Calif., 2003.
- Cattrall, C., J. A. Reagan, K. J. Thome, "Lidar aerosol ratios at 1 and 10 microns," *Proc. SPIE Conf. #5086*, pp. 112-120, Orlando, Florida., 2003.
- Cattrall, C., K. J. Thome, "Exploitation of MODTRAN4 capabilities to predict at-sensor radiance," *Proc. SPIE Conf. #5157*, pp. 98-106, San Diego, Calif., 2003
- Garland, W. C., S. F. Biggar, E. Zalewski, K. J. Thome, "Optical correction for multiple back reflections in an automated spectroradiometric measurement system," *Proc. SPIE Conf. #5159*, pp. 82-90., San Diego, Calif., 2003
- Kneubuehler, M., M. E. Schaepman, K. J. Thome, and D. R. Schlapfer, "MERIS/ENVISAT vicarious calibration over land," *Proc. SPIE Conf. #5234*, pp. 614-623, Barcelona, Spain, 2003.

- Mavko, M., K. J. Thome, J. A. Reagan, "Compiled aerosol optical depth and extinction-to-backscatter climatology for Tucson, AZ," *Proc. SPIE Conf. #5157*, pp. 13-22, San Diego, Calif., 2003
- Thome, K., "Ground-look radiometric calibration approaches for remote sensing imagers in the solar reflective," *Proc. ISPRS*, Denver, 2002.
- Goward, S. N., A. F. Goetz, J. R. Schott, K. J. Thome, J. R. Townshend, S. L. Ustin, C. E. Woodcock, T. Koger, J. Pearlman, R. W. Turner, "The Resource 21 Science Advisory Board: Recommendations for a global observatory to continue the Landsat mission heritage," *Proc. ISPRS*, Denver, 2002.
- Thome, K., R. Barnes, G. Feldman, "Intercomparison of ETM+, MODIS, and SeaWiFS using a land test site," *Proc. SPIE Conf. #4881*, pp. 319-326, Crete, Greece, 2002.
- Fox, N. P., J. Aiken, J. J. Barnett, X. B., R. Carvell, C. Froehlich, S. B. Groom, O. Hagolle, J. D. Haigh, H. H. Kieffer, J. Lean, D. B. Pollock, T. J. Quinn, M. C. Sandford, M. E. Schaepman, K. P. Shine, W. K. Schmutz, P. M. Teillet, K. J. Thome, M. M. Verstraete, E. F. Zalewski, "Traceable radiometry underpinning terrestrial- and helio-studies (TRUTHS)," *Proc. SPIE Conf. #4881*, pp. 395-406, Crete, Greece, 2002.
- Markham, B. L., J. L. Barker, J. A. Barsi, E. Kaita, K. J. Thome, D. L. Helder, F. D. Palluconi, J. R. Schott, P. Scaramuzza, "Landsat-7 ETM+ radiometric stability and absolute calibration," *Proc. SPIE Conf. #4881*, pp. 308-318, Crete, Greece, 2002.
- Thome, K., M. Kuester, and J. Reagan, "Cirrus spectral optical depths retrieved from solar transmittance measurements," *International Geoscience and Remote Sensing Symposium*, Toronto, Canada, 2002.
- Bryant, R., M. S. Moran, S. McElroy, C. Holifield, K. Thome, and T. Miura, "Data continuity of Landsat-4 TM, Landsat-5 TM, Landsat-7 ETM, and Advanced Land Imager (ALI) sensors," *International Geoscience and Remote Sensing Symposium*, Toronto, Canada, 2002.
- Anderson, N., S. Biggar, C. Burkhart, K. Thome, M. Mavko, "Bi-directional calibration results for the cleaning of Spectralon reference panels," *Proc. of SPIE Conf. #4814*, Seattle, pp. 201-210, 2002.
- Biggar, S. F., K. J. Thome, W. T. Wisniewski, "In-flight radiometric calibration of the Advanced Land Imager and Hyperion sensors on the EO-1 platform and comparisons with other earth observing sensor," *Proc. of SPIE Conf. #4814*, Seattle, pp. 289-295, 2002.
- Reagan, J. A., K. J. Thome, D. M. Powell, "Towards establishing an aerosol extinction-to-backscatter ratio climatology," *Proc. A&WMA/AGU Specialty Conference on Regional*

- Haze and Global Radiation Balance - Aerosol Measurements and Models, Bend Oregon, 2001.
- Thome, K. S. Biggar, and P. Slater, "Effects of assumed solar spectral irradiance on intercomparisons of earth-observing sensors," *Proc. SPIE Conf. #4540*, Toulouse, France, pp. 260-269, 2001.
- Teillet, P. M., K. J. Thome, N. P. Fox, J. T. Morisette, "Earth observation sensor calibration using a global instrumented and automated network of test sites (GIANTS), *Proc. SPIE Vol #4540*, Crete, Greece, pp. 246-254, 2002.
- Thome, K., E. Whittington, and N. Smith, "Radiometric calibration of MODIS with reference to Landsat-7 ETM+," *Proc. SPIE Conf. #4483*, San Diego, Calif., pp. 203-210, 2001.
- Czapala-Myers, J. S., K. J. Thome, S. F. Biggar, "Optical sensor package for multi-angle measurements of the surface, *Proc. SPIE Conf. #4480*, San Diego, Calif., pp. 326-333, 2001.
- Kuester, M. A., K. J. Thome, S. F. Biggar, and K. S. Krause, "Solar-radiation-based calibration of an airborne radiometer for vicarious calibration of earth observing sensors," *Proc. SPIE Conf. #4483*, San Diego, Calif., pp. 85-92, 2001.
- Krause, K., S. Biggar, K. Thome, J. Eagen, and D. Kenyon, "On-orbit radiometric calibration using a solar diffuser," *Proc. SPIE Conf. #4483*, San Diego, Calif., pp. 135-145, 2001.
- Thome, K., N. Smith, K. Scott, "Vicarious calibration of MODIS using Railroad Valley Playa," *International Geoscience and Remote Sensing Symposium*, Sydney, Australia, 2001
- Biggar, S. F., K. J. Thome, J. M. Holmes, M. A. Kuester, R. A. Schowengerdt, "In-flight radiometric and spatial calibration of EO-1 optical sensors," *International Geoscience and Remote Sensing Symposium*, Sydney, Australia, 2001
- Holmes, J. M., K. J. Thome, "Comparison of modeled and measured downwelling, diffuse irradiance at a ground-reference calibration test site," *International Geoscience and Remote Sensing Symposium*, Sydney, Australia, 2001
- Kuester, M., K. Thome, K. Krause, K. Canham, E. Whittington, "Comparison of surface reflectance measurements from three ASD FieldSpec FR spectroradiometers and one ASD FieldSpec VNIR Spectroradiometer, *International Geoscience and Remote Sensing Symposium*, Sydney, Australia, 2001
- Markham, B. L., J. L. Barker, E. Kaita, J. A. Barsi, D. L. Helder, F. D. Palluconi, J. R. Schott, K. J. Thome, R. Morfitt, P. Scaramuzza, "Landsat-7 ETM+ radiometric calibration: Two years on-orbit," *International Geoscience and Remote Sensing Symposium*, Sydney, Australia, 2001

- Reagan, J. A., K. J. Thome, D. M. Powell, "Lidar aerosol ratio: Measurements and models," *International Geoscience and Remote Sensing Symposium*, Sydney, Australia, 2001
- Teillet P. M., D. L. Helder, B. L. Markham, J. L. Barker, J. R. Schott, K. J. Thome, R. Morfitt, and F. D. Palluconi, "A lifetime radiometric calibration record for the Landsat Thematic Mapper," *Proc. of 23<sup>rd</sup> Canadian Symp. on Remote Sensing*, pp. 1-10, Quebec City, 2001.
- Thome, K., E. Whittington, and M. Kuester, "Radiance validation of MASTER in the solar reflective and application to the in-flight calibration of ASTER," *Proceedings of 14th International Conference and Workshops of Applied Geologic Remote Sensing*, pp. 346-353, Las Vegas, Nevada, 2000
- Thome, K. and P. Nandy, "Accuracy of ground-reference calibration of imaging spectroradiometers at large view angles," *Proceedings SPIE Conf. #4132*, , pp. 260-268, San Diego, Calif., 2000.
- Thome, K., E. Whittington, N. Smith, P. Nandy, and E. Zalewski, "Ground-reference technique for the absolute calibration of MODIS," *Proceedings SPIE Conf. #4135*, , pp. 51-59, San Diego, Calif., 2000.
- Nandy, P., K. Thome, and S. Biggar, "Sensitivity analysis of a CCD-based camera system for the retrieval of bidirectional reflectance distribution function for vicarious calibration" *Proceedings SPIE Conf. #4132*, , pp. 279-289, San Diego, Calif., 2000.
- Whittington, E. E., K. J. Thome, R. A. Barnes, and K. A. Canham, "Radiometric calibration of the Sea-viewing Wide Field of View Sensor using ground-reference techniques," *Proceedings SPIE Conf. #4135*, , pp. 294-301, San Diego, Calif., 2000.
- Thome, K., E. Whittington, J. LaMarr, N. Anderson, P. Nandy, "Early ground-reference calibration results for Landsat-7 ETM+ using small test sites," *Proceedings SPIE Conf. #4049*, , pp. 134-142, Orlando, Florida, 2000.
- Thome, K. J., J. H LaMarr, S. F. Biggar, and A. S. Lopez, "Ground-reference calibration of Landsat-7 ETM+," *Proceedings SPIE Conf. #3870*, pp. 234-242, Florence, Italy, 1999.
- Biggar, S. F., K. J. Thome, P. R. Spyak, and E. F. Zalewski, "Solar-radiation based calibration in the range 740 to 2400 nm," *Proceedings SPIE Conf. #3870*, pp. 228-233, Florence, Italy, 1999.
- Nandy, P., K. Thome, and S. Biggar, "Laboratory characterization of a CCD camera system for retrieval of bi-directional reflectance distribution function," *Proceedings SPIE Conf. #3870*, pp. 243-253, Florence, Italy, 1999.
- Teillet, P.M., G. Fedosejevs, R.P. Gauthier, R.T. Shin, N.T. O'Neill, K.J. Thome, S.F. Biggar, and A. Meygret, 1999, "Quality Assurance and Stability Reference (QUASAR)

Monitoring Results for Six Earth Observation Sensors Using Hyperspectral Data", Proceedings of Fifth International Symposium on Spectral Sensing Research (ISSSR) and ISPRS Commission VII Working Group 1 on Fundamental Physics and Modeling in Remote Sensing, Las Vegas, 1999.

Teillet, P. M, G. Fedosejevs, R. P. Gauthier, R. T. Shin, N. T. O'Neill, K. J. Thome, S. F. Biggar, H. Ripley, and A. Meygret, "Radiometric calibration of multiple Earth observation sensors using airborne hyperspectral data at the Newell County rangeland test site," *Proc. SPIE Conf. #3750*, Denver, Colorado, pp. 470-481, 1999.

Teillet, P. M, G. Fedosejevs, R. P. Gauthier, N. T. O'Neill, K. J. Thome, S. F. Biggar, H. Ripley, and A. Meygret, "Radiometric calibration of Orbview-2 SeaWiFS and SPOT-4 Vegetation using airborne hyperspectral data," *Fourth Int'l. Airborne Remote Sensing Conference and Exhibition at the 21<sup>st</sup> Canadian Symposium on Remote Sensing*, Ottawa, Canada, pp. I371-I377, 1999.

Thome, K., J. LaMarr, K. Scott, and C. Gustafson-Bold, "Methods for the calibration of SPOT-4 HRVIR and Vegetation," *Proceedings SPIE #3439*, San Diego, California, pp. 439-449, 1998.

Nandy, P., K. Thome, S. Biggar, "Instrument for retrieval of BRDF data for vicarious calibration," *International Geoscience and Remote Sensing Symposium*, Seattle, Washington, pp. 562-564, 1998.

Smith, J., K. Thome, B. Crowther, S. Biggar, "Field evaluation of a diffuse-to-global irradiance meter for vicarious calibration," *International Geoscience and Remote Sensing Symposium*, Seattle, Washington, pp. 562-564, 1998.

Thome, K., R. Parada, S. Schiller, J. Conel, J. LaMarr, "Evaluation of the use of dark and bright targets for the in-flight calibration of AVIRIS," *Proceedings of the Seventh Annual JPL Airborne Earth Science Workshop*, Pasadena, Calif., 1998.

Crowther, B. G., K. J. Thome, S. F. Biggar, C. J. Burkhart, "Internally baffled integrating sphere cosine collector," *Proc. SPIE #3117*, San Diego, Calif., pp. 246-252, 1997.

LaMarr, J. H., K. J. Thome, P. R. Spyak, "Verification and characterization of an autotracking radiometer," *Proc. SPIE #3117*, San Diego, Calif., pp. 262-68, 1997.

Parada, R. J., K. J. Thome, S. F. Biggar, R. P. Santer, J. H. LaMarr, "Radiometer calibrations using solar radiation," *Proc. SPIE #3117*, San Diego, Calif., pp. 253-261, 1997.

Spyak, P. R., J. H. LaMarr, K. J. Thome, "Errors in laboratory measurements resulting from atmospheric absorption near 1380 nm," *Proc. SPIE #3117*, San Diego, Calif., pp. 208-216, 1997.

- Descour, M. R., E. L. Dereniak, C. E. Volin, K. J. Thome, A. B. Schumacher, S. C. Schehr, M. E. Maese, "Demonstration of a high speed imaging spectrometer (U)," IRAS Workshop, Tucson, Arizona, March 1997.
- Thome, K. and C. Gustafson-Bold, "Proposed method for the calibration of VEGETATION using HRVIR," Workshop on Calibration of Optical and Thermal Sensors, Toulouse, France, September 18-20, 1996.
- Arai, K., S. Tsuchida, K. Thome, "Calibration plan and preliminary field campaign for ASTER," *Proc. EUROPTO #2960*, Taormina, Sicily, pp. 256-265, 1996.
- Parada, R. J., K. J. Thome, and R. P. Santer, "Results of dark target vicarious calibration using Lake Tahoe," *Proc. EUROPTO #2960*, Taormina, Sicily, pp. 332-343, 1996.
- Santer, R. P., C. Schemechtig, and K. J. Thome, "BRDF and surface-surround effects on SPOT-HRV vicarious calibration," *Proc. EUROPTO #2960*, Taormina, Sicily, pp. 344-354, 1996.
- Thome, K. J., "Sensitivity analysis and validation plans for the retrieval of surface reflectance from ASTER," *Proc. SPIE Conf. #2820*, Denver, Colorado, pp. 88-96, 1996.
- Thome, K. J., C. L. Gustafson-Bold, P. N. Slater, and W. H. Farrand, "In-flight radiometric calibration of HYDICE using a reflectance-based approach," *Proc. SPIE Conf. #2821*, Denver, Colorado, 1996.
- Scott, K. P., K. J. Thome, and M. R. Brownlee, "Evaluation of the Railroad Valley playa for use in vicarious calibration," *Proc. SPIE Conf. #2818*, Denver, Colorado, 1996.
- Murray, A., B. Eng, and K. Thome, "Implementation of a very large atmospheric correction lookup table for ASTER using a relational database management system," *Proc. of SPIE Conf. 2820*, Denver, Colorado, pp. 245-258, 1996.
- Gustafson-Bold, C. L. and K. J. Thome, "Cross-calibration of two small footprint sensors," *International Geoscience and Remote Sensing Symposium*, Lincoln, Nebraska, pp. 1283-1285, 1996.
- Slater, P. N., S. F. Biggar, J. M. Palmer, and K. J. Thome, "Unified pre- and in-flight radiometric calibration of satellite sensors," *Proc. SPIE Conf. #2583*, Paris, France, pp. 130-141, 1995.
- Mueller, J. L., R. S. Fraser, S. F. Biggar, K. J. Thome, P. N. Slater, A. W. Holmes, R. A. Barnes, C. T. Weir, D. A. Siegel, D. W. Menzies, A. F. Michaels, and G. Podesta, Volume 27, "Case studies for SeaWiFS calibration and validation, Part 3", NASA Technical Memorandum 104566, May 1995.

- McClain C. R., R. S. Fraser, J. T. McLean, M. Darzi, J. K. Firestone, F. S. Patt, B. D. Schieber, R. H. Woodward, E. Yeh, S. Mattoo, S. F. Biggar, P. N. Slater, K. J. Thome, A. W. Holmes, R. A. Barnes and K. J. Voss, Volume 19, "Case studies for SeaWiFS calibration and validation, Part 2", NASA Technical Memorandum 104566, August 1994.
- Biggar, S. F., P. N. Slater, K. J. Thome, A. W. Holmes, R. A. Barnes. "Preflight solar-based calibration of SeaWiFS," SeaWiFS Technical Report Series (1994).
- Slater, P. N., S. F. Biggar, K. J. Thome, D. I. Gellman and P. R. Spyak, "The inflight radiometric calibration of ASTER by reference to well-characterized scenes," *Proc. SPIE Conf. #2317*, Rome, Italy, pp. 49-60, 1994.
- Thome, K. J., "Proposed atmospheric correction for the solar-reflective bands of the Advanced Spaceborne Thermal Emission and Reflection Radiometer," *International Geoscience and Remote Sensing Symposium*, Pasadena, pp. 202-204, 1994.
- Thome, K. J., S. F. Biggar, D. I. Gellman, and P. N. Slater, "Absolute-radiometric calibration of Landsat-5 Thematic Mapper and the proposed calibration of the Advance Spaceborne Thermal Emission and Reflection Radiometer," *International Geoscience and Remote Sensing Symposium*, Pasadena, pp. 2295-2297, 1994.
- Biggar, S. F., K. J. Thome, P. N. Slater, L. K. Balick, and C. J. Golanics, "Solar-radiation-based absolute calibration of optical sensors: SeaWiFS and a Daedalus 1268," *International Geoscience and Remote Sensing Symposium*, Pasadena, pp. 1992-1995, 1994.
- Qi, J., F. Cabot, M. S. Moran, G. Dedieu, and K. J. Thome, "Biophysical parameter retrievals using bidirectional measurements," *International Geoscience and Remote Sensing Symposium*, Pasadena, pp. 1816-1818, 1994.
- Thome, K. J., S. F. Biggar, and P. N. Slater, "Recent absolute radiometric calibration of Landsat-5 TM and its application to the atmospheric correction of ASTER in the solar reflective region," *Proc. DLPO Workshop on Atmospheric Correction of Landsat Imagery*, Torrance, Calif., pp. 36-40, 1993.
- Thome, K. J., Y. J. Kaufman, and R. S. Fraser, "Summary and results of recent aerosol workshop," *Proc. DLPO Workshop on Atmospheric Correction of Landsat Imagery*, Torrance, Calif., pp. 1-5, 1993.
- Thome, K. J., M. W. Smith, J. M. Palmer, and J. A. Reagan. "Method and instrument for retrieving total columnar water vapor from solar transmittance," *Proc. SPIE Conf. #1968*, Orlando, Florida, pp. 526-532, 1993.
- Thome, K. J., D. I. Gellman, R. J. Parada, S. F. Biggar, P. N. Slater, and M. S. Moran, "In-flight radiometric calibration of Landsat-5 Thematic Mapper from 1984 to present," *Proc. SPIE Conf. #1938*, Orlando, Florida, pp. 126-131, 1993.



- Biggar, S. F., P. N. Slater, K. J. Thome, A. W. Holmes, and R. A. Barnes, "Preflight solar-based calibration of SeaWiFS," *Proc. SPIE Conf. #1939*, Orlando, Florida, 233-242, 1993.
- Gellman, D. I., S. F. Biggar, M. C. Dinguirard, P. J. Henry, M. S. Moran, K. J. Thome, P. N. Slater, "Review of SPOT-1 and -2 calibrations at White Sands from launch to the present.," *Proc. SPIE Conf. #1938*, Orlando, Florida, pp. 118-125, 1993.
- Reagan, J., K. Thome, B. Herman, R. Stone, J. DeLuisi, and J. Snider, "A comparison of columnar water vapor retrievals obtained with a near-IR solar radiometer and microwave radiometer," *Proc. CO-MEAS '93*.
- Reagan, J., K. Thome, B. Herman, R. Stone, J. DeLuisi, and J. Snider, "Intercomparisons of columnar water vapor retrievals obtained with near-IR solar radiometers and microwave radiometers," *Proc. Specialist Meeting on Microwave Radiometry and Remote Sensing Applications*, Boulder, Colo., Dept. Commerce, pp.334-337, 1992.
- Reagan, J. A., K. J. Thome, and B. M. Herman, "A simple instrument and technique for measuring columnar water vapor via near-IR differential solar transmission measurements," *International Geoscience and Remote Sensing Symposium*, Helsinki, pp. 903-906, 1991.
- Reagan, J. A., K. J. Thome, B. M. Herman, and R. Gall, "Water vapor measurements in the 0.94 micron absorption band: calibration, measurements and data applications," *International Geoscience and Remote Sensing Symposium*, Ann Arbor, Michigan, pp. 63-67, 1987.