

Curriculum Vitae (April, 2007)

Thomas H. Painter, Ph.D.

Research Scientist II

National Snow and Ice Data Center

University of Colorado, Boulder

Beginning 1 July

Assistant Professor

Department of Geography

University of Utah

Contact Information

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Education

1989

BS, Department of Mathematics: Linear Algebra and Abstract Algebra, Colorado State University, under Prof. Kenneth Klopfenstein

1996

MA, Department of Geography, University of California, Santa Barbara, under Prof. Jeff Dozier

2002

PhD, Department of Geography, University of California, Santa Barbara, under Prof. Jeff Dozier

2003

Postdoctoral Fellow, Cooperative Institute for Research in Environmental Sciences (CIRES), under Prof. Konrad Steffen

Research Interests

Snow Radiative Forcing and Melt associated with Dust and Soot

Alpine Surface Radiation

Multi-spectral and hyperspectral remote sensing of snow and desert surfaces

Snowmelt Hydrology

Snow Radiative Properties

Integration of Remote Sensing and Distributed Snow Models

Dust source mapping

Robotic Instrumentation

Personal Information

Born September 9, 1965, Fort Collins, Colorado USA

Spouse Tania U. Painter

Child Emile M. Painter

Grants Awarded

2006-2009

US Army Corps of Engineers, Cold Regions Research and Engineering Laboratory, *Integrated, Operational High Resolution Snow Cover Mapping in the Optical and Microwave Wavelengths*, **Principal Investigator: Thomas H. Painter (NSIDC)**, Co-Investigators: Richard L. Armstrong, Mary J. Brodzik. Amount: *in negotiation*.

2006-2007

Western Water Assessment, *Impacts of desert dust deposition on snowmelt runoff*, **Principal Investigator: Thomas H. Painter (NSIDC)**, Andrew P. Barrett (NSIDC). Amount: \$27,088.

2006-2007

Cooperative Institute for Research in Environmental Sciences (CIRES) Innovative Research Program, *Highly resolved wavelength dependencies of aerosol optical properties in the shortwave*

- spectrum*, Allison McComiskey (CIRES), **Co-Investigators: Thomas H. Painter (NSIDC), Paul Ricchiazzi (UCSB)**. Amount: \$25,420.
- 2005-2006 Cooperative Institute for Research in Environmental Sciences (CIRES) Innovative Research Program, *Realization of Snow/Vegetation Interactions from Field Spectroscopy*, Principal Investigator: Noah P. Molotch (CIRES), **Co-Investigator: Thomas H. Painter (NSIDC)**. Amount: \$14,077.
- 2004 Consortium of Universities for the Advancement of the Hydrologic Sciences (CUAHSI) Travel Grant for Position Paper, *Mountain Hydrology of the Semi-Arid Mountain West*: Roger C. Bales (UC-Merced), Jeff Dozier (UCSB), Noah Molotch (UA), **Thomas H. Painter (NSIDC)**, and Robert Rice (UC-Merced). Amount: \$5000.
- 2004-2005 NSF Hydrologic Sciences, Supplement to *Radiative Effects of Desert Dust Deposits in Alpine Snow*, **Principal Investigator: Thomas H. Painter (NSIDC)**, Co-Investigator: Andrew P. Barrett (NSIDC), Co-Investigator: Chris Landry (Center for Snow and Avalanche Studies). Amount: \$30,840.
- 2004-2007 NSF Atmospheric Sciences, Climate Dynamics, *Radiative Effects of Desert Dust Deposits in Alpine Snow*, **Principal Investigator: Thomas H. Painter (NSIDC)**, Co-Investigator: Chris Landry (Center for Snow and Avalanche Studies). Amount: \$397,729.
- 2003-2008 NASA REASoN, *Multi-Resolution Snow Products for the Hydrologic Sciences*, Principal Investigator: Jeff Dozier (UCSB), **Co-Investigators: James Frew (UCSB), Thomas H. Painter (NSIDC)**, Roger Bales (UCM), Jiancheng Shi (UCSB). Amount: \$3,950,000.

Publications

Journal Articles

1994

- [1] Schimel, D.S., B.H. Braswell, E.A. Holland, R. McKeown, D.S. Ojima, **T.H. Painter**, W.J. Parton, and A.R. Townsend, Climatic, edaphic, and biotic controls over storage and turnover of carbon in soils, *Global Biogeochemical Cycles*, **8(3)**, 279-293.

1995

- [2] Kittel, T.G.F., N.A. Rosenbloom, **T.H. Painter**, D.S. Schimel, and VEMAP Modeling Participants, The VEMAP integrated database for modeling United States ecosystem/vegetation sensitivity to climate change, *Journal of Biogeography*, **22(4-5)**, 857-862.
- [3] Kittel, T.G.F., N.A. Rosenbloom, D.S. Schimel, **T.H. Painter**, H.H. Fisher, A. Grimsdell, and VEMAP Members. The VEMAP United States Database. World Wide Web access (<http://www.gcd.ucar.edu/vemap/>). Published Dataset.
- [4] **VEMAP Members**, Vegetation/ecosystem modeling and analysis project: Comparing biogeography and biogeochemistry models in a continental-scale study of terrestrial ecosystem responses to climate change and CO₂ doubling, *Global Biogeochemical Cycles*, **9(4)**, 407-437.

1996

- [5] Kittel, T.G.F., D.S. Ojima, D.S. Schimel, R. McKeown, J. G. Bromberg, **T.H. Painter**, N.A. Rosenbloom, W.J. Parton, and F. Giorgi, Model-GIS integration and dataset development for assessing the vulnerability of terrestrial ecosystems to climate change, pp293-297, in: *GIS and Environmental Modeling: Progress and Research Issues*. M.F. Goodchild, L.T. Steyaert, B.O. Parks, C. Johnston, D. Maidment, M. Crane and S. Glendinning (eds.). GIS World, Inc., Ft. Collins, CO.

1997

- [6] Schimel, D.S., **VEMAP Participants**, and B.H. Braswell, Continental scale variability in ecosystem processes: Models, data, and the role of disturbance, *Ecological Monographs*, **V67(N2)**, 251-271.

1998

- [7] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, The effect of grain size on spectral mixture analysis of snow-covered area with AVIRIS data, *Remote Sensing of Environment*, **65**, 320-332.
- [8] Albright, T.P., **T.H. Painter**, D.A. Roberts, J.C. Shi, J. Dozier, and E. Fielding, Classification of Surface Types Using SIR-C/X-SAR, Mt. Everest Area, Tibet, *Journal of Geophysical Research - Planets*, **V103(E11)**, 25,823-25,837.

2001

- [9] **Painter T.H.**, B. Duval, W.H. Thomas, M. Mendez, S. Heintzelman, and J. Dozier, Detection and quantification of snow algae using an airborne imaging spectrometer, *Applied and Environmental Microbiology*, **67(11)**, 5267-5272.

2002

- [10] Green, R. O., J. Dozier, D.A. Roberts, and **T. H. Painter**, Spectral snow reflectance models for grain size and liquid water fraction in melting snow for the solar reflected spectrum, *Annals of Glaciology* **34**, 71-73.

2003

- [11] **Painter, T. H.**, J. Dozier, D. A. Roberts, R. E. Davis, and R. O. Green, Retrieval of subpixel snow-covered area and grain size from imaging spectrometer data, *Remote Sensing of Environment* **85**, 64-77.
- [12] **Painter, T. H.**, B. Paden, and J. Dozier, Automated Spectro-Goniometer: a spherical robot for the measurement of the bi-directional reflectance of snow, *Reviews of Scientific Instruments* **74(12)**, 5179-5188.

2004

- [13] **Painter, T. H.**, and J. Dozier, The effect of anisotropic reflectance on imaging spectroscopy of snow parameters, *Remote Sensing of Environment* **89(4)**, 409-422.
- [14] **Painter, T. H.**, and J. Dozier, Measurements of the hemispherical-directional reflectance of snow at fine spectral and angular resolution, Vol. 109, No. D18, D18115, 10.1029/2003JD004458, *Journal of Geophysical Research-Atmospheres*.
- [15] Dozier, J., and **T. H. Painter**, Multispectral and hyperspectral remote sensing of alpine snow properties, *Annual Review of Earth and Planetary Sciences* **32**, 465-494.
- [16] Okin, G., and **T. H. Painter**, Effect of grain size on spectral reflectance of sandy desert surfaces, *Remote Sensing of Environment* **89(3)**, 272-280.
- [17] Molotch, N., **T. H. Painter**, R. Bales, and J. Dozier, Incorporation of remotely-sensed albedo into a spatially-distributed snowmelt model, Vol. 31, No. 3, L03501, 10.1029/2003GL019063, *Geophysical Research Letters*.

2006

- [18] Green R. O., **T. H. Painter**, D. A. Roberts, and J. Dozier, Measuring the three phases of water in a melting snow environment with an imaging spectrometer in the solar reflected spectrum, *Water Resources Research*, 10.1029/2005WR004509.
- [19] Schaepman, G., M. Schaepman, **T. H. Painter**, J. Martonchik, and S. Dangel, Reflectance quantities in optical remote sensing - definitions and case studies, *Remote Sensing of Environment* **103(1)**, 27-42.
- [20] Bales, R., N. Molotch, **T. H. Painter**, M. Dettinger, R. Rice, and J. Dozier, Mountain hydrology of the western United States, *Water Resources Research*, 42, W08432, doi:10.1029/2005WR004387.

2007

- [21] **Painter, T. H.**, N. Molotch, M. Cassidy, M. Flanner, and K. Steffen, Contact spectroscopy for the determination of stratigraphy of snow grain size, *Journal of Glaciology*, **53(180)**, 121-127.
- [22] Malenovsky, Z., H. M. Bartholomeus, F. W. Acerbi-Junior, J. T. Schopfer, **T. H. Painter**, G. F. Epema, and A. K. Bregt, Scaling dimensions in spectroscopy of soil and vegetation, *International Journal of Applied Earth Observation and Geoinformation*, **in press**.
- [23] M. Clark, D. Slater, **T. H. Painter**, W. Meier, J. Stroeve, A. P. Barrett, B. Raup, and M. Serreze, Scientific and societal uses of remotely sensed snow and ice information, AGU Monograph: *Research and Economic Applications of Remote Sensing Data Products*, **in press**.
- [24] Scambos, T., T. Haran, M. Fahnestock, **T. H. Painter**, and J. Bohlander, MODIS-based Mosaic of Antarctica (MOA) data sets: Continent-wide surface morphology and snow grain size, *Remote Sensing of Environment*, **in press**.

In review

- Painter, T. H.**, A. P. Barrett, C. Landry, J. Neff, M. P. Cassidy, C. Lawrence, K. E. McBride, and G. L. Farmer, Impact of disturbed desert soils on duration of mountain snowcover, *Geophysical Research Letters*, in preparation.

- Dozier, J., R. O. Green, A. W. Nolin, and **T. H. Painter**, Interpretation of snow's color from imaging spectrometry, *Remote Sensing of Environment*, **in review**.

- Green R. O., D. A. Roberts, **T. H. Painter**, and J. Dozier, Measuring surface snow grain size and liquid water fraction at the regional scale with imaging spectroscopy in the Sierra Nevada, California, *Journal of Geophysical Research-Atmospheres*, **in review**.
- Cline, D., ..., **T.H. Painter**, ..., Cold Land Processes Experiment (CLPX 2002-2003): Airborne Remote Sensing, *Journal of Hydrometeorology*, **in review**.
- Davis, R. E., **T. H. Painter**, and many others, Cold Land Processes Experiment (CLPX 2002-2003): Spaceborne Remote Sensing, *Journal of Hydrometeorology*, **in review**.
- Hardy, J., ..., **T. H. Painter**, ..., Cold Land Processes Experiment (CLPX 2002-2003): Local Scale Observation Site (LSOS), *Journal of Hydrometeorology*, **in review**.
- Liu, J., R. A. Melloh, C. E. Woodcock, R. E. Davis, **T. H. Painter**, and C. McKenzie, Modeling Gap Fractions in Forest Canopies: Implications for Mapping Fractional Snow Cover Using Optical Remote Sensing, *Journal of Hydrometeorology*, **in review**.

In preparation

- Painter, T. H.**, J. Deems, and M. P. Cassidy, Spatial variability of snow grain size and albedo at the sub-kilometer scale, *in preparation*.
- Painter, T. H.**, J. Dozier, C. McKenzie, and R. E. Davis, Retrieval of subpixel snow-covered area and grain size from MODIS reflectance data, *in preparation*.
- Painter, T. H.**, and M. Mishchenko, Spectral consistency of grain texture and morphology in snow directional reflectance modeling, *in preparation*.
- Molotch, N. P., and **T. H. Painter**, Realization of snow/vegetation interactions with field spectroscopy, *in preparation*.
- Deems, J., and **T. H. Painter**, LIDAR measurement of snow depth: accuracy and error sources, *in preparation*.

Book Chapters

2004

- [1] Bruegge, C. J., M. Schaepman, G. Strub, U. Beisl, A. Demircan, B. Geiger, **T.H. Painter**, B.E. Paden, and J. Dozier, Outdoor measurements of BRDF, *in Reflection properties of Vegetation and Soil - with a BRDF Data base*, M. von Schönemark, B. Geiger, and H. P. Röser, eds., Berlin: Wissenschaft & Technik Verlag.

Conference Proceedings

1995

- [1] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Improving alpine-region spectral unmixing with optimal-fit snow endmembers, *Summaries of the Fifth Annual JPL Airborne Earth Science Workshop*, Jet Propulsion Laboratory, Pasadena, CA, pp. 125-128.
- [2] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Improving alpine-region spectral mixture analysis estimates of snow-covered area, *Proceedings of Conference on Multispectral and Hyperspectral Sensing of Forestry and Natural Resources at the European Symposium on Satellite Remote Sensing II*, Paris, France, SPIE Volume 2585, pp. 323-333.

1996

- [3] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Sub-pixel snow-covered area and snow grain size from mixture analysis with AVIRIS data, *Summaries of the Sixth Annual JPL Airborne Earth Science Workshop, AVIRIS Workshop*, Jet Propulsion Laboratory, Pasadena, CA.
- [4] Shi, J.C., **T.H. Painter**, and J. Dozier, Estimation of snow surface albedo using Landsat Thematic Mapper, *Proceedings IGARSS'96*, Lincoln, NE, pp. 2249-2251.

1997

- [5] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Estimating snowcover and grain size from AVIRIS data with spectral mixture analysis and modeled snow spectra, *SPIE '97*, San Diego, CA.

1998

- [6] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Automated subpixel snow parameter mapping with AVIRIS data, *Summaries of the 7th JPL Airborne Earth Science Workshop, AVIRIS Workshop*, Jet Propulsion Laboratory.
- [7] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Automated subpixel snow parameter mapping of imaging spectrometer data, *SPIE '98*, Beijing, China (*Invited Paper*).

1999

- [8] Okin, G.S., B. Murray, D.W. Curkendall, H. Siegel, J. Collier, C.D. Miller, D.A. Roberts, **T.H. Painter**, and W.J. Okin, The Supercomputing Visualization Workbench for the Analysis and Classification of Imaging Spectrometer Data, *Summaries of the 8th JPL Airborne Earth Science Workshop, AVIRIS Workshop*, Jet Propulsion Laboratory.

2000

- [9] **Painter, T.H.**, B. Paden, and J. Dozier, Automated Spectro-Goniometer: a robotic arm for the measurement of snow bi-directional reflectance distribution function, *Western Snow Conference 2000*, Port Angeles, WA (*Best Student Paper Award*).
- [10] Colee, M.T., **T.H. Painter**, C.W. Rosenthal, and J. Dozier, A high-resolution distributed snowmelt model in an Alpine catchment, *Western Snow Conference 2000*, Port Angeles, WA.
- [11] **Painter, T.H.**, J. Dozier, and D. A. Roberts, Validation of an automated algorithm for the retrieval of snow covered area and snow grain size from imaging spectrometer data, *Proceedings SPIE2000*, San Diego, California.
- [12] **Painter, T.H.**, R.E. Davis, J. Dozier, D. Donahue, W. Li, R. Kattelmann, D. Dawson, W. Rosenthal, J. Fiori, B. Harrington, and P. Pagner, The Mammoth Mountain cooperative snow study site: Data acquisition, management, and dissemination, *International Snow Science Workshop 2000*, Big Sky, Montana.

2001

- [13] **Painter, T. H.**, B. Duval, W. H. Thomas, M. Mendez, S. Heintzelman, and J. Dozier, Mapping snow algae concentration in the Sierra Nevada with imaging spectroscopy, *Proceedings of the Western Snow Conference (in press)*, Sun Valley, Idaho.
- [14] Molotch, N. P., **T. H. Painter**, M. T. Colee, C. W. Rosenthal, J. Dozier, and R. C. Bales, Analysis of the spatial variability of snow cover depletion in an alpine watershed, Tokopah Basin, Sierra Nevada, California, USA, *Proceedings of the Western Snow Conference*, Sun Valley, Idaho, USA (*Best Student Paper Award*).

2002

- [15] **Painter, T. H.**, and J. Dozier, Measurements of the bi-directional reflectance factor of snow at fine spectral and angular resolution, *Proceedings of the 70th Western Snow Conference*, Sol Vista, Colorado, USA.

2004

- [16] Schaepman-Strub, G., **T. H. Painter**, S. Huber, S. Dangel, M. Schaepman, J. Martonchik, and F. Berendse, About the importance of the definition of reflectance quantities – results of case studies, *ISPRS 2004*, Istanbul, Turkey.

2005

- [17] **Painter, T. H.**, J. Dozier, and R. Bales, Enhanced satellite remote sensing products from MODIS for estimation of snow cover, *Proceedings of the 73rd Western Snow Conference*, Great Falls, Montana, USA.
- [18] Schaepman-Strub G, M Schaepman, S Dangel, **T.H. Painter** and J Martonchik, About the use of reflectance terminology in imaging spectroscopy. *EARSeL eProceedings*, 4(2), 191-202.

2006

- [19] **Painter, T. H.**, A. P. Barrett, and C. Landry, Shortwave radiative forcing by desert dust deposition in mountain snowcover, *International Snow Science Workshop 2006*, Telluride, Colorado, USA.

*Abstracts***1994**

- [1] Kittel, T.G.F., N.A. Rosenbloom, **T.H. Painter**, D.S. Schimel, and VEMAP Modeling Participants, A physically-consistent database for simulation of U.S. ecosystem/vegetation responses to global change: The VEMAP dataset, *1994 AGU Fall Meeting*, San Francisco, CA, EOS, **218**.

1995

- [2] Rosenbloom, N.A., T.F.G. Kittel, R. McKeown, D.S. Schimel, and **VEMAP Modeling Participants**, The importance of topographic effects in a gridded bioclimatology for scaling ecological models, *1995 AGU Spring Meeting*, Baltimore, MD, EOS, **S126**.
- [3] Kittel, T.G.F., N.A. Rosenbloom, D.S. Schimel, **T.H. Painter**, H.H. Fisher, A.W. Grimsdell, and VEMAP Modeling Participants, A bioclimatic, soils, and land cover database for simulation of U.S.

ecosystem/vegetation responses to global change: The VEMAP dataset, *IUGG XXI General Assembly*, Boulder, CO, **A200**.

1996

- [4] Ojima, D.S., T.G.F. Kittel, R. McKeown, D.S. Schimel, W.J. Parton, H.H. Fisher, and **T.H. Painter**, Ecosystem modeling of spatially explicit land surface changes for climate and global change analysis, *Workshop on Integrating GIS and Environmental Modeling*, Santa Fe, NM.
- [5] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Snow-covered area and snow grain size from complex mixture analysis, *Progress in Electromagnetics Research Symposium (PIERS'96)*, Innsbruck, Austria, **546**.
- [6] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Sub-pixel snow-covered area and snow grain size from reference endmember spectral mixture models, *1996 Fall AGU Meeting*, San Francisco, CA.

1997

- [7] Albright, T., **T.H. Painter**, D.A. Roberts, E. Fielding, J.C. Shi, and J. Dozier, Mapping snow and ice in the Khumbu Himal with DEM-corrected SIR-C/X-SAR data, *Workshop on Remote Sensing of Planetary Ices: Earth and Other Solid Bodies*, Flagstaff, AZ.
- [8] **Painter, T.H.**, D.A. Roberts, R.O. Green, and J. Dozier, Snow-covered area and grain size from remotely-sensed spectral data, *ICE, News Bulletin of the International Glaciological Society*, **113/114**.
- [9] **Painter, T.H.**, D.A. Roberts, and J. Dozier, Distributed sub-pixel snow parameters from remote sensing of maritime and continental snow regimes, *1997 Fall AGU Meeting*, San Francisco.

2000

- [10] Sickman, J.O., J.L. Stoddard, **T.H. Painter**, and J.M. Melack, Regional analysis of inorganic-nitrogen yield and retention in high-elevation ecosystems of the Sierra Nevada and Rocky Mountains, *2000 Fall AGU Meeting*, San Francisco, CA.

2001

- [11] **Painter, T. H.**, B. Duval, W. Thomas, and J. Dozier, Mapping snow algae concentrations in the Sierra Nevada snowpack with AVIRIS data, *10th JPL Airborne Earth Science Workshop*, Jet Propulsion Laboratory, Pasadena, CA.
- [12] **Painter, T. H.**, J. Dozier, and D. A. Roberts, The effect of anisotropic bi-directional reflectance on imaging spectroscopy models for retrieving snow physical properties, *2001 Fall AGU Meeting*, San Francisco, CA.

2002

- [13] **Painter, T. H.**, J. Dozier, and D. A. Roberts, The effect of anisotropic reflectance on retrievals of snow properties from imaging spectrometer data, *Summaries of the 11th JPL Airborne Earth Science Workshop*, Jet Propulsion Laboratory.
- [14] Okin, G., and **T. H. Painter**, Grain size effects on spectral reflectance of desert soil surfaces, *11th JPL Airborne Earth Science Workshop*, Jet Propulsion Laboratory, Pasadena, CA.
- [15] **Painter, T. H.**, Analysis of airborne and spaceborne hyperspectral data for the 2002 Cold Land Processes Experiment, *2002 Fall AGU Meeting*, San Francisco, CA.
- [16] Colee, M. T., **T. H. Painter**, Dozier, J., Turney, D., and N. Molotch, A Spatially-Explicit Snow Model of a Mid-latitude Alpine Basin, *2002 Fall AGU Meeting*, San Francisco, CA.
- [17] Molotch, N., **T. Painter**, M. T. Colee, R. C. Bales, and J. Dozier, Incorporating Remotely Sensed Snow Surface Grain Size Into Spatially Distributed Snowmelt Modeling, *2002 Fall AGU Meeting*, San Francisco, CA.
- [18] Davis, R. E., D. Cline, K. Elder, G. Scharfen, M. Parsons, J. C. Shi, K. McDonald, and **T. Painter**, The Cold Land Processes Field Experiment (CLPX): Satellite Measurements, *2002 Fall AGU Meeting*, San Francisco, CA.
- [19] Carroll, T., D. Cline, D. Imel, J. C. Shi, A. Gasiewski, S. Yueh, **T. Painter**, and S. Katzberg, The Cold Land Processes Field Experiment (CLPX): Airborne Remote Sensing Data Collection, *2002 Fall AGU Meeting*, San Francisco, CA.

2003

- [20] **Painter, T. H.**, 2002 NASA/NWS Cold Land Processes Experiment (CLPX): AVIRIS Missions, *2003 AVIRIS Workshop*, Pasadena, CA.
- [21] Molotch, N., **T. H. Painter**, and J. Dozier, Incorporation of remotely-sensed snow grain size into a spatially-distributed physical snowmelt model, *2003 AVIRIS Workshop*, Pasadena, CA.

- [22] **Painter, T. H.**, W. H. Thomas, and B. Duval, Spatio-temporal dynamics of alpine snow algae measured with multi-year imaging spectrometer data, *AGU/EGS Joint Assembly*, Nice, France.
- [23] Molotch, N. P., **T. H. Painter**, R. C. Bales, and J. Dozier, Accuracy assessment of a net radiation and temperature index snowmelt model using ground observations of snow water equivalent in an alpine basin, *AGU/EGS Joint Assembly*, Nice, France.
- [24] Molotch N. P., **T. H. Painter**, R. C. Bales, and J. Dozier, Incorporating Net Radiation Data into an Index Snowmelt Model in an Alpine Basin, *2003 Western Snow Conference*, Scottsdale, AZ.
- [25] **Painter, T. H.**, Analysis of airborne and spaceborne hyperspectral data for the 2003 Cold Land Processes Experiment, *2003 Fall AGU Meeting*, San Francisco, CA.
- [26] Clark, B., **T. H. Painter**, W. Manley, and J. Dixon, Using sub-pixel resolution of satellite imagery to determine archeological site potential in the cryosphere, *2003 Fall AGU Meeting*, San Francisco, CA.
- [27] Barrett, A. P., M. Dyurgerov, **T. H. Painter**, T. Pfeffer, and B. Raup, Mass Balance Measurements of a Small Glacier in the Colorado Front Range, *2003 Fall AGU Meeting*, San Francisco, CA.
- [28] Molotch, N.P., **T.H. Painter**, R.C. Bales, and J. Dozier, Assimilation of remotely sensed snow cover properties into operational snowmelt modeling, *13th Annual El Dia del Agua*, Dept. of Hydrology and Water Resources, University of Arizona.

2004

- [29] **Painter, T. H.**, Analysis of the 2003 AVIRIS acquisitions for the Cold Land Processes Experiment, *2004 AVIRIS Workshop*, Pasadena, CA.
- [30] **Painter, T. H.**, R. Bales, Enhanced snow cover products from MODIS for the hydrologic sciences, *2004 Fall AGU Meeting*, San Francisco, CA.
- [31] Bales, R., J. Dozier, N. Molotch, **T. H. Painter**, and R. Rice, Mountain hydrology of the semi-arid western U.S.: Research needs, opportunities, and challenges, *2004 Fall AGU Meeting*, San Francisco, CA.
- [32] Landry, C., **T. H. Painter**, and A. P. Barrett, Mountain snow system interactions – an integrative approach, *2004 Fall AGU Meeting*, San Francisco, CA.
- [33] Molotch, N. P., **T.H. Painter**, and R.C. Bales, Simulating snow / atmosphere energy exchange using semi-physical models and remotely sensed snow albedo data, *2004 AGU Western Pacific Geophysics Meeting*, Honolulu, HI.

2005

- [34] **Painter, T.H.**, R. Bales, and J. Dozier, Enhanced subpixel snow cover products from MODIS for snowmelt hydrologic applications, *4th EARSeL Workshop – Remote sensing of snow and glaciers – Important Water Resources of the Future*, 21-23 February 2005, Berne, Switzerland.
- [35] **Painter, T. H.**, J. Neff, C. Landry, and A. P. Barrett, Radiative and hydrologic effects of desert dust deposits in alpine snow, *Annual meeting of the Association of American Geographers*, 5-9 April, Denver, CO.
- [36] Deems, J., **T. H. Painter**, and C. Landry, Spatial and historical contingency of snowpack properties, *Annual meeting of the Association of American Geographers*, 5-9 April, Denver, CO.
- [37] **Painter, T. H.**, J. Dozier, and R. Bales, Enhanced Satellite Remote Sensing Products from MODIS for Estimation of Snowcover, *Western Snow Conference*, 11-14 April, Great Falls, MT.
- [38] Clark, M., A. Slater, A. Barrett, L. Hay, G. Leavesley, and **T. H. Painter**, Hydrologic Applications of Remotely Sensed Snow Information: Challenges and Opportunities, *Western Snow Conference*, 11-14 April, Great Falls, MT.
- [39] **Painter, T. H.**, A.P. Barrett, C. Landry, and J.C. Neff, Desert dust deposition in mountain snow cover, *2005 Fall AGU Meeting*, San Francisco, CA.
- [40] Barrett, A.P., **T.H. Painter**, and C. Landry, Impact of Desert Dust on Meltrates and Runoff from Mountain Snowpacks, *2005 Fall AGU Meeting*, San Francisco, CA.
- [41] Cassidy, M., and **T.H. Painter**, Hyperspectral Analysis of Dust Concentration, Snow Grain Size, and Broadband Albedo of Alpine Snowcover, *2005 Fall AGU Meeting*, San Francisco, CA.
- [42] Dozier, J., **T.H. Painter**, and J. E. Frew, Characteristics of Snow Cover in the Sierra Nevada from MODIS and Landsat, *2005 Fall AGU Meeting*, San Francisco, CA.
- [43] Mahowald, N., D. Muhs, S. Levis, M. Yoshioka, P. Rasch, C. Zender, G. Okin, and **T.H. Painter**, Deposition Changes in the Past And The Future, *2005 Fall AGU Meeting*, San Francisco, CA.
- [44] McBride, K., **T.H. Painter**, and C. Landry, A synoptic climatology of desert dust deposition to the alpine snowpack in the San Juan Mountains, Colorado, U.S.A., *2005 Fall AGU Meeting*, San Francisco, CA.

[45] Neff, J., L. Farmer, **T.H. Painter**, C. Landry, and R. Reynolds, Effects of Desert Dust on Nutrient Cycling in the San Juan Mountains, Colorado, *2005 Fall AGU Meeting*, San Francisco, CA.

2006

[46] **Painter, T. H.**, J. Dozier, M. P. Clark, and P. Slaughter, Enhanced snow cover products from MODIS for the hydrologic and cryospheric sciences, *2006 European Geophysical Union*, Vienna, Austria.

[47] **Painter, T. H.**, A. P. Barrett, J. C. Neff, and C. Landry, Radiative forcing by dust deposition in mountain snow cover, *2006 European Geophysical Union*, Vienna, Austria.

[48] Rice, R., **T. H. Painter**, and R. Bales, Integration of the MODIS snowcover products into snowmelt runoff modeling, *2006 Western Snow Conference*, Las Cruces, NM.

[49] **Painter, T. H.**, A. P. Barrett, C. Landry, M. Cassidy, J. C. Neff, C. Lawrence, K. Thatcher, Radiative and Hydrologic Forcing by Desert Dust in Mountain Snow, *2006 CIRES Symposium*, Boulder, CO, USA.

[50] Barrett, A. P., **T. H. Painter**, and C. Landry, Impact of desert dust on melt rates and runoff from mountain snowpacks, *63rd Eastern Snow Conference*, Newark, Delaware, USA.

[51] **Painter, T. H.**, and N. P. Molotch, Realization of snow/vegetation interactions with field spectroscopy and automated snow depth observations, *63rd Eastern Snow Conference*, Newark, Delaware, USA.

[52] Dozier, J., R. O. Green, A. W. Nolin, and T. H. Painter, Interpretation of Snow's Color from Imaging Spectrometry, *IGARSS 2006*, Denver, Colorado, USA.

[53] Frew, J., **T. H. Painter**, P. Slaughter, and J. Dozier, Tracking Metadata and Lineage of the Data Processing Chain for Mapping Snow Cover Properties With the NASA MODIS, *IGARSS 2006*, Denver, Colorado, USA.

[54] Landry, C., **T. H. Painter**, A. P. Barrett, and J. Neff, Radiative and hydrologic impacts of desert dust in mountain snow cover, *Colorado Water Workshop*, Gunnison, Colorado, USA.

[55] **Painter, T. H.**, A. P. Barrett, C. Landry, and C. R. Lawrence, Radiative forcing of desert dust deposition in mountain snow cover, *International Symposium Cryospheric Indicators on Global Climate Change*, Cambridge UK, August 2006.

[56] **Painter, T. H.**, Shortwave radiative and snowmelt forcing by dust deposition in mountain snow cover, *MTNCLIM Symposium 2006*, Mt. Hood, Oregon, USA.

[57] **Painter, T. H.**, and M. P. Cassidy, Hyperspectral Analysis of Direct Shortwave Radiative Forcing of Dust in Mountain Snowcover, *International Snow Science Workshop 2006*, Telluride, Colorado, USA.

[58] **Painter, T. H.**, A. P. Barrett, C. Landry, J. C. Neff, M. P. Cassidy, C. R. Lawrence, K. McBride, G. L. Farmer, Shortwave radiative forcing by dust deposition in mountain snow cover, *International Snow Science Workshop 2006*, Telluride, Colorado, USA.

[59] Barrett, A. P., **T. H. Painter**, and C. Landry, Impacts of desert dust on snowmelt and runoff from mountain snow cover, *International Snow Science Workshop 2006*, Telluride, Colorado, USA.

[60] Deems, J., and **T. H. Painter**, Lidar measurement of snow depth: accuracy and error sources, *International Snow Science Workshop 2006*, Telluride, Colorado, USA.

[61] Lawrence, C., J. Neff, **T. H. Painter**, and S. Castle, The coupling of mountains and deserts: Biogeochemical influence of eolian deposition in the San Juan Mountains, CO USA, *International Snow Science Workshop 2006*, Telluride, Colorado, USA.

[62] **Painter, T. H.**, A. P. Barrett, C. Landry, J. Neff, M. P. Cassidy, C. Lawrence, and K. McBride, Shortwave radiative and melt forcing by dust in mountain snow cover, *Fall AGU 2006*, San Francisco, California, USA.

[63] Barrett, A. P., and **T. H. Painter**, Diagnosing Early 2006 Snowmelt and Runoff in the Colorado Rocky Mountains, *Fall AGU 2006*, San Francisco, California, USA.

[64] Schneebeli, M., C. Maetzler, and **T. H. Painter**, The Relevance of a Precise In Situ Measurement of the Optically Equivalent Grain Size in a Snowpack, *Fall AGU 2006*, San Francisco, California, USA.

- [65] Rice, R., R. Bales, and **T. H. Painter**, Estimating the spatial distribution of snow properties in Sierra Nevada, California basins using MODIS fractional snowcover products, *Fall AGU 2006*, San Francisco, California, USA.
- [66] Nolin, A. W., **T. H. Painter**, and M. C. Payne, A Spectro-directional Approach To Improving Snow Cover Mapping In Forested Areas, *Fall AGU 2006*, San Francisco, California, USA.
- [67] Molotch, N. P., **T. H. Painter**, and M. P. Cassidy, Snow / Vegetation Interactions Inferred From Contact Spectroscopy, *Fall AGU 2006*, San Francisco, California, USA.
- [68] Dozier, J., **T. H. Painter**, and J. E. Frew, Space-Time Series of MODIS Snow Cover Products, *Fall AGU 2006*, San Francisco, California, USA.
- [69] Khalsa, S. J. S., **T. H. Painter**, M. McAllister, and R. Duerr, Applications of MODIS Snow and Ice Products, *Fall AGU 2006*, San Francisco, California, USA.
- [70] Landry, C., P. Lyon, **T. H. Painter**, and A. P. Barrett, Mountain system monitoring at Senator Beck Basin, San Juan Mountains, Colorado, *Fall AGU 2006*, San Francisco, California, USA.
- [71] Sickman, J., N. P. Molotch, T. Meixner, M. Williams, and **T. H. Painter**, Estimating Stream Chemistry During the Snowmelt Pulse Using Remotely Sensed Snow Observations and a Coupled Snowmelt and Biogeochemical Modeling Approach, *Fall AGU 2006*, San Francisco, California, USA.
- [72] Zender, C. S., M. G. Flanner, J. T. Randerson, N. M. Mahowald, P. J. Rasch, M. Yoshioka, and **T. H. Painter**, Climate Effects and Efficacy of Dust and Soot in Snow, *Fall AGU 2006*, San Francisco, California, USA.

Professional Experience

Research

1992 – 1994	Programmer , Climate System Modeling Program, Climate and Global Dynamics Division, National Center for Atmospheric Research, Boulder, CO, USA, Supervisor: David Schimel.
1994 – 2002	Graduate Student Researcher , NASA EOS IDS 'Hydrology, Hydro-Chemical Modeling, and Remote Sensing in Seasonally Snow-Covered Alpine Drainage Basins', Institute for Computational Earth System Science, UCSB, Supervisor: Jeff Dozier.
1997 – 1999	Graduate Student Researcher (Non-funded), 'Detection and Mapping with Imaging Spectrometry', Los Alamos National Laboratory/University of California, Supervisor: Dar Roberts.
1999 – 2001	Graduate Student Researcher , NASA Earth Science Information Provider Program 'Earth System Science Workbench', Donald Bren School of Environmental Science and Management, UCSB, Supervisors: Jeff Dozier and James Frew.
2002 – 2003	Research Associate , CIRES Visiting Fellowship, Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, Supervisor: Koni Steffen.
2003 – 2004	Research Scientist I , National Snow and Ice Data Center, University of Colorado, Boulder.
2004 – Present	Research Scientist II , National Snow and Ice Data Center, University of Colorado, Boulder.
2004 – Present	Research Associate (affiliate) , Institute for Computational Earth System Science, University of California at Santa Barbara.
2005 – Present	Affiliate Faculty , Department of Forest, Rangeland and Watershed Stewardship, Colorado State University, Fort Collins.
2007 (as of 1 July)	Assistant Professor , Department of Geography, University of Utah, Salt Lake City.

Teaching

- 1997 **Guest Lecturer**, 'Physical Geography', UCSB – Department of Geography, Topic: '*Cryospheric Processes*'
- 1998 **Teaching Assistant**, 'Environmental Optics', UCSB – Department of Geography, with Dr. Dar A. Roberts
- 1999 **Guest Lecturer**, 'Analytic Geometry Calculus II', Cerro Coso Community College, Mammoth Lakes, California, Topic: '*Application of Calculus in Optical Remote Sensing*'
- 1999 - 2001 **Lecturer**, 'The Mountain Snowpack', UCSB – Donald Bren School of Environmental Science and Management, with Dr. Jeff Dozier
- 2000 **Guest Lecturer**, 'Earth Radiation Budget and Clouds', UCSB – Department of Geography, Topic: '*Remote Sensing of Snow Cover Properties and Distributed Snowmelt Modeling*', for Professor Catherine Gautier
- 2001 **Guest Lecturer**, 'Advanced Remote Sensing', UCSB – Department of Geography, Topic: '*Characterizing the alpine snowpack: hyperspectral goniometry to imaging spectroscopy*', for Professor Dar Roberts
- 2002 **Lecturer**, 'Remote Sensing Field Measurements', University of Colorado-Boulder, Departments of Geography and Geology, with Dr. Alex Goetz, Dr. Koni Steffen, and Dr. Carol Wessman
- 2002 **Guest Lecturer**, 'Snow Hydrology', Colorado State University, Watershed Science, Topic: '*Remote Sensing of Snow*', for Professor Stephen Fassnacht
- 2003 **Guest Lecturer**, 'Remote Sensing', University of Colorado, Department of Geography, Topic: '*Imaging Spectroscopy of Alpine Snow*', for Professor Konrad Steffen
- 2004 **Invited Lecturer**, Master Class on 'State-of-the-art remote sensing in agro-ecosystems', Center for Geo-Information, University of Wageningen, Topic: '*Field measurement techniques, scaling and uncertainties*', for Professor Michael Schaepman
- 2005 **Guest Lecturer**, 'Digital Image Analysis', University of Colorado, Department of Geology, Topic: '*Imaging Spectroscopy of Alpine Snow*', for Professor Alex Goetz
- 2005 **Guest Lecturer**, 'Snow Hydrology', Department of Geography, University of Colorado, Topic: '*Remote Sensing of Alpine Snow*', for Professor Mark Williams
- 2005 **Guest Lecturer**, 'Snow and Ice', Department of Geography, University of Colorado, Topic: '*Snow pack energy budget/hydrology*', '*Optical properties of snow*', for Professor Roger Barry
- 2007 **Guest Lecturer**, 'Introduction to Hydrology', Department of Geography, University of Colorado, Topic: '*Snowpack energy budget/hydrology*', for Natalie Mladenov.

Student Committees

Preeti Tuladhar, MS, Oregon State University, Committee Member, *Graduated: 2006*

Maureen P. Cassidy, MS, University of Colorado, Committee Member, *Projected graduation: 2008*

Jeffrey S. Deems, PhD, Colorado State University, Committee Member, *Projected graduation: 2007*

Corey P. Lawrence, PhD, University of Colorado, Committee Member, *Projected graduation: 2008*

Kathleen Thatcher, MS, Northern Arizona University, Committee Member, *Projected graduation: 2007*

Seminars Organized

1997 – 1999

Remote Sensing: Techniques and Applications, with Dr. Dar A. Roberts, University of California, Santa Barbara

2002

Front Range Cryosphere Seminar, with Dr. Steven Fassnacht, co-convened at University of Colorado-Boulder and Colorado State University

2003-2006

Cryospheric and Polar Processes Seminar, National Snow and Ice Data Center, University of Colorado, Boulder

Student Mentoring

1999

Mentor for Summer Intern, ICESSE Earth System Science Summer Undergraduate Research Program, University of California, Santa Barbara, Ken Rumelt, Project: 'A Preliminary Study on the Relationship Between Pesticide Use and Alpine Lake Eutrophication: Emerald Lake'

2000

Mentor for Graduate Student Researcher, Noah Molotch, University of California, Santa Barbara: 'Analysis of the Spatial Variability of Snow Cover Depletion in an Alpine Watershed, Tokopah Basin, Sierra Nevada, California, U.S.A.'

Field Experience

1994

Field Technician, NASA BOREAS Project, Saskatchewan and Manitoba Provinces, Canada

1994

Co-leader and Participant, Ground Truth Mission for NASA SIR-C/X-SAR, Tien Shan, Xinjiang Province, China

1995 – 2000

Leader and participant, Ground Truth Missions for NASA Airborne Visible InfraRed Imaging Spectrometer (AVIRIS), Sierra Nevada, California and Rocky Mountains, Colorado

1997-1998

Participant, Monthly distributed snow water equivalent field campaigns - NASA, Sierra Nevada, California

1999-2002

Co-leader, Field measurements of optical and textural properties of desert surface, Manix Basin, California

2000

Leader and participant, Ground Truth Mission for Research Scanning Polarimeter, Sierra Nevada, California

2000

Co-leader and participant, Field Measurements of Optical Properties of Algal Snow, Sierra Nevada, California

2001

Leader, Field Measurements of Snow Bi-directional Reflectance Distribution Function and Spatial Distribution of Snow Physical Properties, Sierra Nevada, California

2002-2003

Intensive Study Area Leader and Team Leader, NASA/NWS Cold Land Processes Experiment, Rocky Mountains, Colorado

2003

Leader, Field measurements of snow distribution for meteorological tower placement, Senator Beck Basin, San Juan Mountains, Colorado

- 2003 **Participant**, Field measurements of glacier mass balance, Arapaho Glacier, Front Range, Colorado
- 2004 **Leader**, Field measurements of snow spectral reflectance and dust concentration, Senator Beck Basin, San Juan Mountains, Colorado
- 2005-present **Leader**, Field measurements of snow spectral reflectance, dust concentration, and snow water equivalence, Senator Beck Basin, San Juan Mountains, Colorado

Data Management

1999 – 2002

Design, Implementation, and Maintenance, Data Management Plan, Mammoth Mountain Cooperative Snow Study Site (<http://neige.bren.ucsb.edu/mmsa/>)

2002

Development, Snow water equivalence field measurements data page, National Snow and Ice Data Center (NSIDC) (<http://nsidc.org/data/swe>)

Engineering and Design

1998 – 2002

Design, Contracting, and Assembly, Automated Spectro-Goniometer (ASG), a robotic arm for the measurement of the hyperspectral bi-directional reflectance distribution function (BRDF) of snow

2001

Definition of Performance and Calibration Requirements, Snow and ice property definitions for the Airborne Prism Experiment (APEX) airborne imaging spectrometer, in development by University of Zürich Remote Sensing Laboratories and Swiss-Belgian consortium on behalf of European Space Agency.

Website Management

2001 – Present

Webmaster, Western Snow Conference, (<http://www.westernsnowconference.org>)

Journal Reviews

Annals of Glaciology
 Computers & Geosciences
 Geophysical Research Letters
 Hydrological Processes
 IEEE Transactions on Geoscience and Remote Sensing
 International Journal of Applied Earth Observation and Geoinformation
 Journal of Geophysical Research-Atmospheres
 Journal of Geophysical Research-Solid Earth
 Journal of Glaciology
 Journal of Atmospheric and Oceanic Technology
 Photogrammetric Engineering and Remote Sensing
 Remote Sensing of Environment
 Water Resources Research

Proposal Reviews

National Science Foundation (NSF)
 National Aeronautics and Space Administration (NASA)
 USDA Small Business Innovation Research (USDA, SBIR)

Scientific Committees and Working Groups

1998

Post-2002 NASA Land Surface Hydrology Mission Planning Workshop, Irvine, CA, April

2001

6th NASA Cold Land Processes Experiment (CLPX) Workshop, Boulder, CO, November 7-9

2002	7 th NASA Cold Land Processes Experiment (CLPX) Workshop, Hanover, NH, June 3-4
2003	8 th NASA Cold Land Processes Experiment (CLPX) Workshop, Boulder, CO, May 28-29
2003	NSIDC Distributed Active Archive Center User Working Group, Byrd Polar Research Center, Ohio State University, Columbus, OH, October 16-17 (Organizer for NSIDC)
2003	North Park Snow Workshop, National Center for Atmospheric Research, Boulder, CO, November 6-7
2004	NSIDC Distributed Active Archive Center User Working Group, NSIDC, University of Colorado at Boulder, June 2-4 (Organizer for NSIDC)
2004	Dust Emission and Modeling Workshop, University of Colorado at Boulder, October.
2004	Workshop on EOS Snow and Ice Products, Raytheon Building, Largo, MD, November 16-17, Invited Panelist.
2005	NSIDC Distributed Active Archive Center User Working Group, NSIDC, University of Colorado at Boulder, February 16-17 (Organizer for NSIDC)
2005	San Juan Mountains 2 nd Research Retreat, Mountain Studies Institute, September 17, <i>University of Colorado at Boulder</i> .
2005	Snow System Science Workshop, Center for Snow and Avalanche Studies and Cooperative Institute for Research in Environmental Sciences, University of Colorado at Boulder, October 21.
2006	Phoenix Water Stressor Workshop, Consortium for Science, Policy, and Outcomes, Arizona State University, November 2-3.

Planning Panels

2003 - Present	National Snow and Ice Data Center Science Planning Board, Junior Scientific Representative
2004 - Present	Science advisor, NSIDC MODIS product team
2004 - Present	American Geophysical Union Remote Sensing Technical Committee
2006 - Present	American Geophysical Union Cryospheric Board

Membership in Professional Organizations

AAC (American Alpine Club)
 AAG (American Association of Geographers)
 AGU (American Geophysical Union)
 EGU (European Geophysical Union)
 IGS (International Glaciological Society)
 WSC (Western Snow Conference)

Honors and Awards

Phi Beta Kappa, Colorado State University, 1989

Dr. James E. Church Memorial Award, *Best Student Paper*, 'Automated Spectro-Goniometer for the Measurement of Snow Bi-directional Reflectance', Western Snow Conference, 2000, lead author

Dr. James E. Church Memorial Award, *Best Student Paper*, 'Analysis of the spatial variability of snow cover depletion in an alpine watershed, Tokopah basin, Sierra Nevada, California, U.S.A.', Western Snow Conference, 2001, co-author

Cooperative Institute for Research in Environmental Science *Visiting Researcher Fellowship*, University of Colorado, 2002

Best Paper, 'Incorporating Net Radiation Data into an Index Snowmelt Model in an Alpine Basin', Western Snow Conference, 2003, co-author

NASA, *Group Achievement Award*, EOSDIS Data Centers Customer Support Team, National Snow and Ice Data Center, 2006.

Scientific Collaboration

CSAS	Center for Snow and Avalanche Studies, Radiative Effects of Dust Deposits in Alpine Snow (Chris Landry)
NASA GISS	Goddard Institute for Space Studies, Nonsphericity effects on snow directional reflectance (Michael Mishchenko)
NASA JPL	NASA Jet Propulsion Laboratory, Pasadena, CA, Imaging spectroscopy of snow properties (Robert O. Green)
NCAR	National Center for Atmospheric Research, Radiative Effects of Dust Deposits in Global Snow Cover (Natalie Mahowald)
NSIDC	National Snow and Ice Data Center, Radiative and Hydrologic Effects of Dust Deposits in Alpine Snow (Andrew Barrett)
NSIDC	National Snow and Ice Data Center, Global Land Ice Measurements from Space (Richard Armstrong)
RSL, UW	University of Zurich, Remote Sensing Laboratory, Zurich, Switzerland <i>and</i> University of Wageningen, the Netherlands, Hyperspectral goniometric measurement of bidirectional reflectance distribution functions of terrestrial surfaces (Michael Schaepman, Gabriela Schaepman-Strub)
SIO	Scripps Institute of Oceanography, La Jolla, CA, Remote sensing of Snow Algae (William Thomas)
UCB	University of Colorado at Boulder, Radiative Effects of Desert Dust Deposits in Alpine Snow (Jason Neff)
UCB	University of Colorado at Boulder, Proliferation of Remote Sensing Uncertainty into Hydrologic Modeling (Martyn Clark)
UCLA	University of California, Los Angeles, Documentation of dust emission sites in western US and globally (Gregory Okin)
UCM	University of California, Merced, Integration of remotely sensed snow products into regional hydrologic models (Roger Bales)
UCSB	University of California, Santa Barbara, Spectral mixture analysis techniques for snow cover characterization with imaging spectrometer data (Jeff Dozier, Dar A. Roberts)
USACE CRREL	United States Army Corps of Engineers, Cold Regions Research and Engineering Laboratory, Optical properties and laboratory characterization of snow (Robert E. Davis)

Invited Talks

9/16/1998	Beijing, China: ' <i>Automated Algorithm for Snow Properties from Imaging Spectrometer Data</i> ', SPIE Imaging Spectrometry Meeting, invited by Robert O. Green
4/2001	Department of Geography, University of Utah (Salt Lake City, UT, USA): ' <i>Characterizing the alpine snowpack: hyperspectral goniometry to imaging spectroscopy</i> ', invited by Thomas Cova

10/2002	National Snow and Ice Data Center, University of Colorado (Boulder, CO, USA): ' <i>Extension of subpixel snow mapping from hyperspectral to multispectral</i> ', invited by Roger Barry.
11/2002	Swiss Federal Institute for Snow and Avalanche Research, (Davos, Switzerland): ' <i>Imaging spectroscopy of alpine snow cover</i> ', invited by Jürg Schweizer.
5/2004	University of Wageningen, The Netherlands, Centre for Geo-Information, Topic: ' <i>Imaging Spectroscopy of Alpine Snow</i> ', invited by Michael Schaepman.
6/2004	University of Wageningen, The Netherlands, Centre for Geo-Information, Video-Conference Questions and Answers, invited by Michael Schaepman.
10/2004	University of Wageningen, The Netherlands, Centre for Geo-Information, ' <i>New directions in remote sensing of mountain snowcover</i> ', Professor Inauguration of Michael Schaepman.
6/2005	University of Wageningen, The Netherlands, Centre for Geo-Information, Video-Conference Questions and Answers, invited by Michael Schaepman.
8/2005	University of California at Santa Barbara, Institute for Computational Earth System Science, ' <i>Radiative and hydrologic impacts of desert dust deposits to alpine snow</i> ', invited by David Siegel.
4/2006	European Geosciences Union, Session: 'Remote sensing of snow and sea ice', Title: ' <i>Enhanced snow cover products from MODIS for the hydrologic and cryospheric sciences</i> ', invited by Marco Tedesco.
11/2006	Natural Resource Ecology Laboratory, ' <i>Dust in Snow Implications for Radiation and Hydrology in Colorado</i> ', invited by Jill Baron.
11/2006	Western Water Assessment, NOAA, ' <i>Accelerated post-settlement mountain snowmelt from desert dust radiative forcing</i> ', invited by Brad Udall.

Meetings/Sessions Convened

2005 Fall AGU, San Francisco, CA, Session Title: *Integrative Earth Sciences: Biogeochemical and Water Cycles* (joint with A, H, OS, PP, C, GC)

Programming Languages

FORTRAN77, FORTRAN90, IDL, C, Visual Basic, PERL, HTML, XML

Software

Image Processing

ENVI, IDL, IPW

Snowmelt Models

SNTHERM.89, Utah Energy Balance

Personal Interests

Alpine and Nordic Skiing
 Rock Climbing and Mountaineering
 Road Cycling
 Trail Running

International Travel
Music