

Dr. Jacola A. Roman
Jet Propulsion Laboratory
M/S 233-300
4800 Oak Grove Drive
Pasadena, CA 91109
Telephone: (818) 354-4960
Email: jacola.roman@jpl.nasa.gov

Education

- | | |
|-----------|---|
| 2013-2016 | University of Wisconsin-Madison, Ph.D. –Atmospheric Science
Advisor: Professor Steve Ackerman
Committee Members: Professor Dan Vimont
Professor Grant Petty Professor
Tristan L’Ecuyer Dr. Robert
Knuteson
Dr. Shane Hubbard
<i>Quantifying the Relationship between Precipitable Water Vapor and
Precipitation for Weather and Climate Applications</i> |
| 2011-2013 | University of Wisconsin-Madison, M.S.- Atmospheric Science
Advisor: Professor Steve Ackerman
<i>Quantifying the ability for high spectral resolution Infrared Sounders to detect
regional Precipitable Water Vapor trends determined by climate models.</i> |
| 2007-2011 | University of Wisconsin-Madison, B.S.
Majors: Atmospheric Science and Math |

Research and Work Experience

- | | |
|--------------|--|
| 2019-Present | Technologist, Jet Propulsion Laboratory – Atmospheric and Physics Weather Group <ul style="list-style-type: none">Analyze and validate remotely sensed atmospheric retrievals from the Atmospheric Infrared Sounder (AIRS) and the Cross-track Infrared and Microwave Sounding Suite (CrIMSS) instrumentsPerform trend analyses and other climate studies on remotely sensed atmospheric observations |
| 2016-2019 | Assistant Teaching Professor, Pennsylvania State University-State College
Department of Meteorology (<i>Telecommute</i>) <ul style="list-style-type: none">Develop a new online 4-course post-baccalaureate certificate program on weather and climate analyticsPlan and create course content centered around case studies using R 2011- |
| 2016 | Research Assistant, University of Wisconsin-Madison AOS Department
Responsibilities: <ul style="list-style-type: none">Analyzed multiple years to decades’ worth of data from NASA AIRS, EUMETSAT IASI, NASA TRMM, UCAR SuomiNet, DOE ARM, NWS Surface Met, and othersCreate a near-real time precipitation and flash flood tool using a derived statistical climatological relationship between PWV and precipitation in matlab and pythonDetermine the accuracy of the existing global operational water vapor estimates from satellite over ocean and land by creating a new matchup method to ground-based GPS observationsDetermine the required accuracy to detect the predicted 100-year mean and extreme PWV trends in 15 years by implementing a statistical method using Probability Distribution Functions of PWVEstimate the economic cost of flooding in the future due to the change in the frequency of extreme PWV events |

- August 2014 Visiting Scientist, EUMETSAT- Dr. Thomas August
Responsibilities:
- Create analysis for assessing PWV of IASI L2 v6 using ground-based SuomiNet GPS stations, MWR, and Sondes as validation
- August 2011 JPL Climate Summer School- Pasadena, CA (August 8-11)
- “Using Satellite Observations to Advance Climate Models”
- 2008-2011 Student Research Assistant, Space Science and Engineering Center, Madison WI;
Worked for SSEC Senior Scientist Robert Knuteson
Responsibilities:
- Conduct literature reviews
 - Collect and analyze large datasets in Matlab
 - Write and submit papers for Journals
 - Attend and present at conferences

Awards

- November 2015: 1st Place Oral Paper at the ITSC-XX Conference, “Measurement requirements and Current Capabilities for Satellite Remote Sensing of Precipitable Water Vapor”
- June 2014: 2nd Place Oral Paper at the 21st Conference on Applied Climatology, “The Climatological Relation Between Precipitable Water Vapor (PWV) and Extreme Precipitation for the September 2013 Colorado Flooding Event”
- April 2014: Best Poster Award (2nd Place) at the ITSC-19 Conference, “Assessing the Ability of IR Sounders in Detecting Extreme Weather Events and Predicting Extreme Floods”
- February 2013: Best Poster Award at the 3rd IASI Conference; “ Using Ground-Based GPS from SuomiNet and NWP Reanalysis for Regional Validation in Europe and North America of PWV from IASI, AIRS, and CrIS for Detecting Extreme Weather Events and Climate Change”
- January 2012: First Place Student Paper Presentation at the 18th Conference on Satellite Meteorology, Oceanography, and Climatology (AMS Meeting in New Orleans); “Using Satellite Atmospheric Infrared Sounder (AIRS) and a Ground-based Global Positioning Satellite (GPS) Network to Validate the Precipitable Water Vapor (PWV) in Global Climate Models (GCMs) and Numerical Weather Prediction (NWP)”

Publications

- Schroeder, M., M. Lockhoff, L. Shi, T. August, R. Bennartz, E. Borbas, H. Brogniez, X. Calbet, S. Crewell, S. Eikenberg, F. Fell, J. Forsythe, A. Gambacorta, K. Graw, S.-P. Ho, H. Hoeschen, J. Kinzel, E. R. Kursinski, A. Reale, J. Roman, N. Scott, S. Steinke, B. Sun, T. Trent, A. Walther, U. Willen, Q. Yang, 2017: GEWEX water vapor assessment (G-VAP). WCRP Report 16/2017, World Climate Research Programme, Geneva, Switzerland, 216 pp.
- Roman, J.A. et al. 2016: A New Method for Near Real-Time Precipitation Estimates and Realistic Minimum Detection Times using Remotely Sensed PWV. *UW Dissertation*.
- Roman, J.A. et al. 2016: Estimating Minimum Detection Times For Satellite Remote Sensing of Trends in Mean and Extreme Precipitable Water Vapor. *J.Clim.* 29, 8211-8230, doi: 10.1175/JCLI-D-16- 0303.1.
- Roman, J., R. Knuteson, T. August, T. Hultberg, S. Ackerman, and H. Revercomb (2016), A global assessment of NASA AIRS v6 and EUMETSAT IASI v6 precipitable water vapor using ground- based GPS SuomiNet stations, *J. Geophys. Res. Atmos.*, 121, 8925–8948, doi:10.1002/2016JD024806.
- Schroder, M., K. Graw, J. Roman, and L. Shi. February 2016: The GEWEX Water Vapor Assessment: Summary of the 5th Meeting. *GEWEX Newsletter*.
- Roman, J.A. et al. 2015: Future Change in Frequency of Extreme Precipitable Water Vapor Events. *J.Clim.*, **28**, 7057-7070. doi: <http://dx.doi.org/10.1175/JCLI-D-14-00679.1>
- Roman, J.A. et al. 2014: Time-To-Detect Trends in Precipitable Water Vapor with Varying Measurement Error. *J.Climate*, **27**, 8259-8275. doi: <http://dx.doi.org/10.1175/JCLI-D-13-00736.1>
- Kataoka F.; Knuteson, R.O.; Kuze, A.; Suto, H.; Shiomi, K.; Harada, M.; Garms, E.M.; Roman, J.A.; Tobin, D.C.; Taylor, J.K.; Revercomb, H.E.; Sekio, N.; Higuchi, R.; Mitomi, Y., "TIR Spectral Radiance Calibration of the GOSAT Satellite Borne TANSO-FTS With the Aircraft-Based S-HIS and the Ground-Based S-AERI at the Railroad Valley Desert Playa," *Geoscience and Remote Sensing, IEEE Transactions on* , vol.52, no.1, pp.89,105, Jan. 2014 doi: 10.1109/TGRS.2012.2236561

- Roman, J.A. et al. 2013: Using AIRS to Assess the Precipitable Water Vapor in Global Climate Models (GCMs) with Regional Validation from SuomiNet. *AIP Conf. Proc.*, **1531**, 480. doi: <http://dx.doi.org/10.1063/1.4804811>
- Roman, J. A et al. 2012: Assessment of Regional Global Climate Model Water Vapor Bias and Trends Using Precipitable Water Vapor (PWV) Observations from a Network of Global Positioning Satellite (GPS) Receivers in the U.S. Great Plains and Midwest. *J.Climate*, **25**, 5471–5493. doi: <http://dx.doi.org/10.1175/JCLI-D-11-00570.1>

Presentations

- Roman, J., R. Knuteson, S. Hubbard, S. Ackerman, and H. Revercomb. A Probabilistic Statistical Climatological Relationship between Precipitable Water Vapor and Precipitation for Near Real Time Forecasting Applications, AMS Annual Meeting, New Orleans, LA, January 2016.
- Roman, J., R. Knuteson, S. Hubbard, S. Ackerman, and H. Revercomb. A New Method for Near Real Time Precipitation Estimates Using a Statistical Relationship between Precipitable Water Vapor and Precipitation, AGU Fall Meeting, San Francisco, CA, December 2015.
- Roman, J., R. Knuteson, T. August, T. Hultberg, S. Ackerman, and H. Revercomb. Changes in the Frequency of Extreme TCWV Events. 5th Meeting on the GEWEX Water Vapor Assessment (G-VAO). 2015 November 5-6; Madison, WI.
- Roman, J., R. Knuteson, T. August, T. Hultberg, S. Ackerman, and H. Revercomb. Climate Measurement Requirements and Current Capabilities for Satellite Remote Sensing of Precipitable Water Vapor. (I
- Roman, J., Knuteson, R., Ackerman, S., and Revercomb, H.. Assessing the Ability of IR Sounders to Detect Atmospheric Rivers and Related Extreme Flooding Events, AGU Fall Meeting, San Francisco, CA, December 2014.
- Roman, J., R. Knuteson, S. Ackerman, H. Revercomb, and D. Tobin. Measurement and Sampling Requirements for Satellite Remote Sensing of Precipitable Water Vapor in a Changing Climate. The Climate Symposium 2014. 2014 October 13-17: Darmstadt, Germany.
- Roman, J. R. Knuteson, S. Ackerman, and H. Revercomb. Measurement and Sampling Requiriements for Satellite Remote Sensing of Precipitable Water Vapor in Changing Climate.. 4th Meeting on the GEWEX Water Vapor Assessment (G-VAP). 2014 October 9-10; Berlin, Germany.
- Roman, J.A., R. Knuteson, S. Ackerman,. H. Revercomb The Climatological Relation Between Precipitable Water Vapor (PWV) and Extreme Precipitation for the September 2013 Colorado Flooding Event. 21st Conference on Applied Climatology. 2014 June 9-13; Denver, CO.
- Roman, J.A., R. Knuteson, S. Ackerman,. Assessing the Ability of IR Sounders in Detecting Extreme Weather Events and Predicting Extreme Floods. ITSC-19. 2014 March 26 - April 1; Jeju Island, South Korea.
- Roman, J.A., R. Knuteson, S. Ackerman, H. Revercomb. Assessing Climate Change: Extreme Weather Events. 45th AGU Fall Meeting. 2013 December 9-13; San Francisco, CA.
- Roman, J.A., R. Knuteson, S. Ackerman. Regional PWV Trends. 3rd Meeting on the GEWEX Water Vapor Assessment (G-VAP). 2013 September 30-2 October; Fort Collins, CO.
- Roman, J.A., R. Knuteson, S. Ackerman. Use of Satellite-derived PWV to Detect Extreme Flooding Events. 2013 Joint Eumetsat/AMS Satellite Conference. 2013 September 16-20; Vienna, Austria.
- Roman, J.A., R. Knuteson, S. Ackerman. Evaluation of GPS RO Moisture Profiles for Climate Monitoring and Extreme Weather Detection. Joint Occultations for Probing Atmosphere and Climate (OPAC-5) and International Radio Occultation Working Group (IROWG-3) Workshop. 2013 September 5-11; Graz, Austria.
- Roman, J.A., R. Knuteson, S. Ackerman, B. Smith, E. Weisz. Using Ground-based GPS from SuomiNet and NWP Reanalysis for Regional Validation in Europe and North America of PWV from IASI, AIRS, and CrIS for Detecting Extreme Weather Events and Climate Change. 3rd IASI Conference. 2013 February 4-8; Hyeres Les Palmiers, France.
- Roman, J. A et al. 2012, Using Regional Validation from SuomiNet, AMSR-e, and NWP Re-analysis to Assess the Precipitable Water Vapor from AIRS and CrIS for Detecting Extreme Weather Events. 44th AGU Fall Meeting. 2012 Dec 3-7; San Francisco, CA.
- Roman, J. A., S. Ackerman, R. Knuteson, H. Revercomb, W. Smith, D. Tobin. Using AIRS and AMSR-E to Assess the Precipitable Water Vapor in Global Climate Models (GCMs) with Regional Validation from SuomiNet and NWP Re-analysis. IRS 2012 August 6-10; Berlin, Germany.
- Roman, J. A., R. Knuteson, S. Ackerman, D. Tobin, W. Smith, H. Revercomb. Time to Detect Climate Trends in Precipitable Water Vapor Using Hyperspectral Infrared Observations. 16th ASSFTS Workshop; 2012, May 22-24; Madison, WI.

- Roman, J. A., R. Knuteson, S. Ackerman, D. Tobin, W.L. Smith, H. Revercomb. Estimating Column Water Vapor Time-To-Detect Using CLARREO Retrievals. CLARREO Science Team Meeting; 2012 April 10-12; Hampton, VA.
- Roman, J. A., R. Knuteson, S. Ackerman, D. Tobin, W.L., Smith, H. Revercomb. Using Satellite Atmospheric Infrared Sounder (AIRS) and a Ground-Based Global Positioning Satellite (GPS) Network to Validate the Precipitable Water Vapor in Global Climate Models (GCMs) and Numerical Weather Prediction (NWP) Regional Reanalysis. 92nd AMS Meeting. 2012 January 22- 26; New Orleans, LA.
- Roman, J.A., R. Knuteson, H. Revercomb, D. Tobin, S. Ackerman. Validation of Regional Global Climate Model (GCM) Water Vapor Bias and Trends Using Precipitable Water Vapor (PWV) from a Network of Global Positioning Satellite (GPS) Receivers in the U.S. Great Plains and Midwest. World Climate Research Programme (WCRP) Open Science Conference; 2011 October 24-28; Denver, CO.
- Roman, J.A., R. Knuteson, H. Revercomb, B. Smith, D. Tobin. Understanding Regional Climate Variations: GCM Validation and Assessment using PWV. CLARREO Science Definition Team Meeting; 2011 October 12-14; Madison, WI
- Knuteson, R.; Roman, J.; Dutcher, S.; Revercomb, H.; Tobin, D. and Smith, W.L.. CLARREO IR Radiance Benchmark Product Analyses. CLARREO Science Definition Team Meeting, 17-19 May 2011, Hampton, VA, 2011.
- Roman, J. A., R. Knuteson, H. Revercomb, D. Tobin, S. Ackerman. Validation of Global Climate Model Moisture Trends for the Coupled Model Intercomparison Project (CMIP) Using GPS Precipitable Water Vapor (PWV) Observations in the U.S. Great Plains from 2000 to 2010. 91st AMS Meeting; 2011 January 23-27; Seattle, WA.
- Knuteson, Robert; Bedka, Sarah; Roman, Jacola; Tobin, Dave; Turner, Dave and Revercomb, Hank. AIRS and IASI Precipitable Water Vapor (PWV) absolute accuracy in the tropics, mid-latitudes, and Arctic ground-truth sites (Powerpoint presentation). ITSC-17 Conference, 19 April 2010, Monterey, CA

Field Campaign Participation

- | | |
|--------------|--|
| October 2013 | Park Falls Balloon Launch Campaign (GOSAT Validation). |
| May 2013 | Arizona Field Campaign (Suomi NPP Validation) |
| June 2011 | Railroad Valley Campaign (GOSAT Validation) |

Community Service and Leadership

- | | |
|----------------|---|
| 2019 - Present | Reviewer for AMS Journals |
| 2017-2019 | Volunteer Food Bank of Fairfax County |
| 2011-2012 | Volunteer for Girl Scouts of Badgerland Wisconsin |
| 2007-2011 | Member of the UW-Madison Campus Girl Scouts
President (2008) and Vice President (2009) |
| 2007-2009 | Math Tutor for UW-Madison Greater University Tutoring Service |