Name	Dr. David N. Whiteman
Education	1978, Physics, City of London Polytechnic, London, England 1979, B.A. Physics, Williams College (cum laude, Phi Beta Kappa), Williamstown, MA 1980-1986, Meteorology, University of Maryland, College Park 1997, M.S. Applied Physics, University of Maryland Baltimore County (UMBC) 2000, Ph.D. Applied Physics, UMBC (dissertation entitled "Investigation of Cloud Properties using a Raman Lidar")
Affiliations	Howard University Washington, DC Universidad Mayor de San Andres La Paz, Bolivia
Current Position	Research Scientist Howard University Washnington, DC
Experience	NASA/GSFC July, 1979 – January, 2017 (Retired) Howard University 2017- Present Universidad Mayor de San Andres, 2023 - Present

Honors and Awards

1975 - NSF Research Grant
1976 – Williams College Bronfman Science Center Research Grant
1979 - Phi Beta Kappa
1986 - NASA/GSFC Special Achievement Award
1987 – NASA/GSFC Outstanding Performance Appraisal
1988 – NASA/GSFC Quality Increase Award
1989 – NASA/GSFC Outstanding Performance Appraisal
1989 - NASA/GSFC Special Act or Service Award
1991 - NASA/GSFC Special Act Award
1991 – NASA/GSFC Outstanding Performance Appraisal
1991 – NASA/GSFC Quality Increase Award
1993 – NASA/GSFC Outstanding Performance Appraisal
1993 – NASA/GSFC Performance Award
1994 – NASA/GSFC Outstanding Performance Appraisal
1994 - 2nd prize, Inaba contest, 17th International Laser Radar Conference, Sendai, Japan
1994 – NASA/GSFC Quality Increase Award
1995 - 97 NASA/GSFC Study Fellowship Program
1997 - NASA/GSFC part time graduate program

1998 – NASA/GSFC Performance award
1999 – NASA/GSFC Performance award
2001 – Elected member of AMS Committee on Laser Atmospheric Studies
2001 – Optical Society of America Allen Prize
2001– NASA/GSFC Special Act Award
2002 – NASA/GSFC Special Act Award
2004- NASA/GSFC Special Act Award
2005 - Fulbright Senior Specialist Candidate
2005 – NASA/GSFC Incentive Award
2006 – NASA/GSFC Special Act Award
2006 – NASA/GSFC New Business Capture Award
2006 – NASA/GSFC Special Act Award
2007 – NASA/GSFC Distinguished Performance Award
2008 – NASA/GSFC Robert H. Goddard Award for Science
2009 – 30 year NASA service award
2010 – NASA Performance Award
2012 – NASA Performance Award
2013 – NASA Performance Award
2014 – NASA Performance Award
2015 – NASA Performance Award
2016 – NASA Performance Award
2020- Bolivian Institute of Physics Award
2023-2024- Fulbright US Scholar

Professional Societies

American Meteorological Society
American Physical Society
American Geophysical Union
Optical Society of America

Academic Affliations

UMBC Joint Center for Earth Systems Technology –
Howard University Department of Physics –
University of Maryland College Park -

Consulting Work

1. McAlister and Quinn – Proposal Preparation Team responding to NASA EVS-3 NRA. 3/2018 - 4/2018
2. NASA/GSFC – Simulations of Spaceborne Water Vapor Lidar in support of the Planetary Boundary Layer Science Task Group. 2/2018 - 9/2018
3. NASA/GSFC – Simulations of Space Borne Lidar for the ACE Mission Preformulation Study. 2/2017 – 8/ 2017

Proposals Won

1. US Embassy La Paz Program Support, 2023, $11k, co-I, PI: Marcos Andrade
2. Fulbright US Scholar Fellowship, 2023-2025
3. USA Study Abroad: Student Exchange Field Research at Mt Chacaltaya, Bolivia, US State Dept., 10/1/2021 – 9/30/2022, $20k, co-PI, PI: Marcos Andrade.
4. HBCU-Excellence in Research: Howard University Beltsville Center for Planetary Boundary Layer Studies, NSF, 5/1/2020 – 4/30/2023, $998k
5. Workshop in Measurements, modeling and analysis of the Planetary Boundary Layer, NSF, 10/1/2019 – 9/30/2021, $83k
6. Plains Elevated Convection at Night (PECAN) – extended Raman water vapor lidar measurements. Ending 9/30/2016. $365k
7. ACE Lidar Optical Data Simulation Using Ground Based Multi-wavelength Lidar and the GEOS-5 Model, GSFC - Internal Research and Development, ending 9/30/2012. $200k
8. Mobile Reference Raman Water Vapor Lidar For the Network for the Detection of Atmospheric Composition Change, NASA, ending 1/31/ 2013. $600k
9. Active and Passive Aerosol Physical Properties Measurements, Inverse Retrieval Studies and In-situ Validation, NASA, ending 10/1/2010.$225k
10. ALVICE (Atmospheric Lidar for Validation, Interagency Collaboration and Education), 2 years, ending 10/1/2009. $600k
11. AURA validation at Beltsville, NASA, 4 yrs, ending 10/2008, PI, $1.2M
12. NDSC participation, NASA, 2 yrs ending 10/ 2007, PI, $500k
13. Airborne water vapor, aerosol, cloud carbon dioxide lidar, IIP, 669k, PI.
14. Aqua retrieval algorithm refinement using Raman lidar and radiosonde measurements for validation, EOS Recompete, 2004 – 2006, $440k, PI
15. Multi-wavelength Raman Lidar Measurements of Aerosols and Clouds, NASA Radiation Sciences Program, 2004 – 2006, $225k, PI
16. Raman Lidar CO_2 measurements, DDF, 2004, $30k (PI)
17. Advanced Interference Filter Technology Development, NASA Advanced Component Technology Program, 2003 – 2005, $237k, (co-PI)
18. Raman Lidar CO_2 measurements, Code 900, $25k (PI)
19. Laser Power Stabilization System, 2002, GSFC Technology Transfer Program, $31k (PI)
20. A new Raman Lidar technique for measuring the direct and indirect effect of aerosols, 2002-2003, GSFC DDF, $100k (PI)
21. Raman Lidar measurements in support of the International H2O Project, 2002-2004, NASA, $350k (co-PI)
22. Use of Raman Lidar and AERI measurements for Aqua validation, 2001-2003, NASA, $410k (PI)
23. Investigation of Atmospheric Dynamics Using Raman Lidar, 2001, NASA, $150k (PI)
24. Aerosol extinction measurements for validation of MicroPulse Lidar retrievals, 2001, NASA, $100k (PI)
25. Lidar measurements of upper tropospheric water vapor for AFWEX, 2001, DOE, $41k (PI)
26. Raman Lidar measurements during the third Water Vapor IOP, 2000, DOE, $124k (PI)
27. Airborne Scanning Raman Lidar System based on a Holographic Optical Element Scanner/ Receiver, 1999-2002, NASA, $1474k (PI)

28. Scanning Raman Lidar Measurements of Sub-Tropical Water Vapor and of Liquid Water in Clouds, 1997-2000, NASA, $525k (PI)
29. MODIS validation using Raman lidar measurements, 1998-2001, NASA, $124k (Co-I)
30. Raman Lidar measurements in support of the DOE ARM program, 1996-1998,DOE, $630k (Co-I)

Field Deployments/Measurement Campaigns

1. Quantifying Pollution Flow-II from the City of La Paz to the High Andes, Jully, 2023
2. Quantifying Pollution Flow from the City of La Paz to the High Andes, May, 2022
3. PECAN, 2015, Kansas, May-July, 2015
4. UWO_2012, London Ontario Canada, May-June, 2012.
5. WAVES_2011, Howard University, Nov, 2011– Apr, 2012.
6. MOHAVE_2009, Table Mountain, CA. October, 2009.
7. N-WAVES_2009, Beltsville, MD, February – March, 2009
8. WAVES_2008, Beltsville, MD, February – April, 2008
9. MOHAVE-II, Table Mountain, CA, October, 2007
10. WAVES_2007, deployment of RASL to Bridgewater, VA for first flights and WAVES_2007 support.
11. MOHAVE-I, Table Mountain, CA, October, 2006
12. WAVES_2006 – June – August, 2006 Beltsville, MD
13. AIRS Water Vapor Experiment (October-November, 2003 Oklahoma)
14. Aqua validation (January – February, 2003 UMBC)
15. Aqua validation (September – October, 2002 GSFC)
16. International Water Vapor Experiment (IHOP) (May – June, 2002 Oklahoma).
17. ARM FIRE Water Vapor Experiment (AFWEX) (November-December, 2000, Lamont, OK)
18. Water Vapor IOP2000 (September-October, 2000, Lamont, OK)
19. Convection and Moisture Experiment-3 (July-September, 1998 Andros Island, Bahamas)
20. Water Vapor IOP-2 (August - September, 1997, Lamont, OK)
21. Convection and Moisture Experiment-2 (July-August, 1995, Wallops Flight Facility, VA)
22. LITE Intercomparison (September, 1994 Greenbelt, MD)Atmospheric Moisture Intercomparison Study (ATMIS) (August, 1986 -Wallops Flight Facility, VA)
23. ARM - Remote Cloud Sensing IOP (April, 1994 Lamont, OK)
24. Convection and Moisture Experiment-1 (July-August, 1993, Wallops Flight Facility, VA)
25. Spectral Radiance Experiment (November-December, 1991, Coffeyville, KS)
26. Atmospheric Moisture Intercomparison Study-II ATMIS-II(July-August, 1992 Wallops Flight Facility, VA)
27. Ozone Validation (September-December, 1989 Table Mountain, CA)
28. Water vapor intercomparison DMSP validations (September-November, 1987, Otis Air National Guard Base, Cape Cod, MA)
29. Atmospheric Moisture Intercomparison Study (ATMIS) (August, 1986 -Wallops Flight Facility, VA)
30. Cooperative Huntsville Meteorological Experiment (COHMEX) (July-August, 1985, Athens, Alabama)

Research Collaborations

1989-2010 Dr. Richard Ferrare/NASA-LaRC, Dr. John Goldsmith, Dr. Tim Tooman and Dr.. David Turner/DOE-Sandia National Laboratories through the Department of Energy, Atmospheric Radiation Measurements Program. Raman lidar development and analysis for the study of atmospheric water vapor and aerosols
1998-2010 UMBC, Joint Center for Earth Systems Technology, Lidar development and analysis
1999-2002 Dr. George Walrafen, Howard University, Raman scattering from liquid water
1999-present Dr. Gelsomina Pappalardo, National Research Council of Italy, Potenza, Italy, Raman Lidar development and analysis
1999-2016 Dr. David Starr, NASA/GSFC Code 913, radiative properties of cirrus clouds measured by Raman lidar
1999-2012 Dr. Jose M. Fernandez, Instituto de Estructura de al Materia, Madrid, Spain, Raman water vapor simulations
1999-2006 Dr. Kenneth Sassen, University of Utah, Raman Lidar design and cirrus cloud multiple scattering
2000-2004 Dr. Gary Jedlovec,NASA/ Marshall Space Flight Center, cirrus influence on GOES satellite radiances
2000-present Dr. Edwin Eloranta, University of Wisconsin, multiple scattering and water vapor studies
2000-2002 Dr. Scott Braun, NASA/GSFC Code 912, comparison of Raman lidar water vapor and cirrus cloud measurements with high resolution hurricane modeling
2000-2010 Dr. Paolo Di Girolamo, University of Basillicata, Potenza, Italy, modeling of the lidar dark band phenomenon, rotational Raman temperature retrievals
2000 – present Dr. Igor Veselovskii, Physics Instrumentation Center of the General Physics Institute, Troitsk, Russia, multi-wavelength characterization of aerosol properties using Raman lidar, liquid water measurements using Raman lidar.
2003 – 2017, Dr. Demetrius Venable – Howard University, Raman water vapor and aerosol lidar
2004 – present, Dr. Eugenia Kalnay – University of Maryland, Lidar network for improvement of mesoscale forecasting
2010 - Dr. GianLuigi Liberti – CNR, Italy. Raman lidar analysis techniques.
2006 - Present – Dr. Marcos Andrade, Laboratory for Atmospheric Physics, UMSA, La Paz Bolivia, Aerosol impacts on high Andean Glaciers at the Mt Chacaltaya GAW Station
2010 – Present – Dr. Paolo Laj, Laboratory for Glaciology, Grenoble, France, Aerosol impacts on high Andean Glaciers at the Mt Chacaltaya GAW Station
2012 – Present – Dr. Mike Bergen, Duke University, Air quality studies in La Paz, Bolivia
2006 – Present – Lic. Ricardo Forno, Universidad Mayor de San Andres, La Paz Bolivia. Backscatter lidar development in support of the Chacaltaya GAW station.

Visiting Scientists Sponsored

1998 Dr. Gelsomina Pappalardo, National Research Council, Potenza, Italy
2000 Dr. Paolo Di Girolamo, University of Basilicata, Potenza, Italy

2001 Dr. Igor Veselovskii, Physics Instrumentation Center, Troitsk, Russia
2002 Dr. Paolo Di Girolamo, University of Basilicata, Potenza, Italy
2002 Dr. Igor Veselovskii, Physics Instrumentation Center, Troitsk, Russia
2003 Dr. Igor Veselovskii, Physics Instrumentation Center, Troitsk, Russia
2004 Dr. Igor Veselovskii, Physics Instrumentation Center, Troitsk, Russia
2005 Dr. Igor Veselovskii, Physics Instrumentation Center, Troitsk, Russia
2005 Dr. Eduardo Landulfo, IPEN, Sau Paolo, Brazil
2006 Mr. Ricardo Forno, Laboratory for Atmospheric Physics, La Paz, Bolivia
2006 Dr. Igor Veselovskii, Physics Instrumentation Center, Troitsk, Russia
2008 Dr. Felicita Russo, NRC of Italy, Potenza, Italy
2008 Mr. Ricardo Forno, Laboratory for Atmospheric Physics, La Paz, Bolivia
2008 Dr. Igor Veselovskii, Physics Instrumentation Center, Troitsk, Russia
2009 Dr. Elian Wolfram, CEILAP (CITEFA-CONICET), Buenos Aires, Argentina
2009 Dr. Igor Veselovskii, Physics Instrumentation Center, Troitsk, Russia
2010 Dr. Gian Luigi Liberti, CNR, Rome, Italy
2011 Dr. Tetsu Sakai,
2011 Mr. Ricardo Forno, Laboratory for Atmospheric Physics, La Paz, Bolivia
2012 – Dr. Tetsu Sakai
2012 – Dr. Veselovskii
2013– Dr. Veselovskii
2014 – Maria Fernanda Sanchez Barero
2014 – Dr. Veselovskii
2015 – Dr. Sakai
2016 – Dr. Veselovskii
2019 – Dr. Maria Jose Granados-Munoz

Students Mentored

1. Kendra Nkeitsa (2023-2024) - Eleanor Roosevelt HS Internship. Pollution transport in the Andes
2. Nehemiah Gray (2023-2024) - Eleanor Roosevelt HS Internship. Pollution transport in the Andes.
3. Ayanna Mann (2023) – Howard University undergraduate. Pollution transport in the Andes.
4. Ramiya Shelton (2023) – Howard University undergraduate. Pollution transport in the Andes.
5. Theodore Daniels (2023) – Howard University undergraduate. Pollution transport in the Andes.
6. Audrey Rappaport (2023) – University of Maryland undergraduate. Pollution transport in the Andes.
7. Joshua Carter (2022) – Howard University undergraduate. Training in radiosonde and lidar operations.
8. Dylaan Jarmon (2022) – Howard University undergraduate. Training in radiosonde and lidar operations.
9. Crystin Goldsby (2022) – Howard University undergraduate. Training in radiosonde and lidar operations.
10. Shayla Reid (2022-2023) - Eleanor Roosevelt HS Internship. Pollution transport in the Andes

11. Hoven Zou (2022-2023) - Eleanor Roosevelt HS Internship. Pollution transport in the Andes
12. Guerodye Joseph (2022) – Howard University undergraduate. Training in radiosonde and lidar operations.
13. Ayo Ajayi (2021-2022) – Eleanor Roosevelt HS Internship. Development of Arduino-based PM sensor
14. Fisayo Okunuga (2021-2022) – Eleanor Roosevelt HS Internship. Testing of a Heated Inlet for PM Measurements.
15. Reuben Vassar (2019-2021) – HU MS awarded May, 2021 Reuben Vassar - Feasibility of Inferring Albedo Using the Multi-filter Rotating Shadowband Radiometer and Radiative Transfer Modeling
16. Hadijat Oke (2020-2021) Eleanor Roosevelt HS Internship. Analysis of tethersonde measurements.
17. Monique Watson (2020-2021) Eleanor Roosevelt HS Internship. Calibration of low-cost PM sensor.
18. Sara Harbison (2019-2020) Eleanor Roosevelt HS Internship. Development of a heated inlet for low cost PM sensors.
19. Kofi Boateng (2019-2020) Eleanor Roosevelt HS Internship. Tethersonde measurements analysis.
20. Audrey Rappaport (2018-2019) Eleanor Roosevelt HS Internship. Low cost sensor testing and calibration.
21. Monique Walker (2010-2016). Howard University PhD in 2014. Post-doc at NASA/ GSFC 2014-2016. Work involved development of an independent calibration capability for Raman water vapor lidar.
22. Scott Rabenhorst (2004 – 2015). Enrolled in PhD program in Atmospheric and Oceanic Sciences at University of Maryland College Park beginning September, 2004. Interests are in the in interface between instrumentation and mesoscale modeling.
23. Felicita Russo (2001 – 2007) of Naples, Italy enrolled in the graduate Physics department at the University of Maryland, Baltimore County (UMBC) in 2001. Her PhD research involves investigation of aerosol and cloud properties using Raman Lidar. Dr. David Whiteman is her PhD research advisor. Thesis successfully defended July 12, 2007. Currently employed by National Research Council of Italy working in lidar.
24. Antonia Gambacorta (2002 – 2006) of Bari, Italy. Enrolled in the Atmospheric Physics program at UMBC, fall 2002. She worked at GSFC for the summer of 2002 in studying the effects of multiple scattering on lidar measurements of cirrus clouds. Dr. David Whiteman is her research advisor.
25. Ogechi Onyewu (2001) worked with the Raman lidar group helping to establish a GPS system for measuring total precipitable water in the atmosphere. She was sponsored through the Goddard/Howard Fellowship in the Atmospheric Sciences.
26. Jose Florez (1998-2000) NASA/GSFC coop student from University of Mayaguez, Puerto Rico.
27. Leopoldo Moldonado (1998 – 2000) NASA/GSFC coop student from University of Mayaguez, Puerto Rico.
28. Stacy Wise (1996- 1999), undergraduate physics student at University of Maryland, Baltimore County. Currently graduate student of Physcis at University of Florida.

29. Jeffrey Freemire (1996-1999), undergraduate mechanical engineering student at University of Maryland, Baltimore County (UMBC). Currently graduate student of Mechanical Engineering at UMBC.
30. Inna Gorin (1993-1995), NASA/GSFC Coop student from University of Maryland, College Park.

Courses Taught

1. Spring, 2006 Techniques in Laser Remote Sensing offered as a graduate course in the Howard University Physics and Astronomy department.
2. Spring, 2010 Techniques in Laser Remote Sensing offered as a graduate course in the Howard University Physics and Astronomy department.
3. Fall, 2019 Guest Speaker Seminar Series
4. Fall, 2020, Written and Oral Scientific Presentation Skills, Fall 2020
5. Spring, 2021 Albedo quantification using radiative transfer modeling
6. Fall, 2023 (UMSA) – Data analysis and Presentation skills in English
7. Fall 2024 (UMSA) – Data analysis and Presentation skills in English

Conferences organized

1. First International Raman Lidar Techniques Workshop, May 2004 NASA/GSFC
2. Organizing committee, The Symposium on Observing and Understanding the Variability of Water in Weather and Climate, Annual Meeting of the American Meteorological Society, 2003
3. Organizing committee and social committee chairman, 19th International Laser Remote Sensing Conference, Annapolis, MD 1998.
4. International Organizing Committee, workshop of Lidar measurements in Latin American, Buenos Aires, Argentina, 2009.
5. Second International Raman Lidar Techniques Workshop on Raman Water Vapor Lidar Calibration Techniques, May 2010, Greenbelt, MD
6. International Organizing Committee, workshop of Lidar measurements in Latin American, La Paz, Bolivia, September, 2011.
7. GRUAN Meeting, Greenbelt, MD 2014.

Invited Talks

1. Department of Atmospheric Sciences, University of Huntsville, Alabama, “Atmospheric Research Using Raman Lidar”, 2002.
2. International Geoscience and Remote Sensing Conference, “Cloud measurements using Raman lidar”, Hawaii, 2000 .
3. International Geoscience and Remote Sensing Conference, “Recent advances in water vapor measurements using Raman lidar technology”, Sydney Australia, 2001 (unable to attend due to lack of travel funds).

Book Chapters

1. Whiteman, D N. , “Lidar: Raman.” in: Holton J R, Curry J A, Pyle J A (eds.) Encyclopedia of Atmospheric Sciences. Academic Press, Oxford, UK, Vol 3, pp. 1202-1212 (2002).
2. D D Turner and D N Whiteman, "Remote Raman spectroscopy. Profiling water vapour and aerosols in the troposphere using Raman lidars", in Handbook of Vibrational Spectroscopy, J.M. Chalmers and P.R. Griffiths (Eds), John Wiley & Sons, Ltd, Volume 4, pp. 2857 - 2878 (2002).
3. Whiteman, D. N., S. H. Melfi, R. A. Ferrare, "Raman Lidar System for Measurement of Water Vapor and Aerosols in the Earth's Atmosphere", *Appl. Opt.* Vol. 31 No. 16 3068 - 3082 (1992) included in “Selected Papers on Laser Applications on Remote Sensing”, SPIE Milestone Series Vol. MS 141, W. B. Grant, E. V. Browell. R. T. Menzies, K. Sassen, and C.-Y. She, Eds. SPIE Optical Engineering Press, 661 pp. (1997).

NASA Tech Memo

Lidar Technology for Carbon Cycle Science, Earth Sciences Directorate Carbon Cycle Theme Lidar Working Group, Forrest Hall and Charles McClain, Eds., J. Abshire, A. Andrews, M. Behrenfeld, b. Blair, J. Burris, A. Chekalyuk, J. Collatz, B. Connerton, P. Dabney, J. Degnan, J. Esper, B. Gentry, J. Gervin, F. Hall, D. Harding, W. Heaps, F. Hoge, R. Kawa, R. Knox, M. Krainak, C. McClain, R. Nelson, J. Rall, D. Whiteman, NASA/TM-2003-212234 (2003).

Refereed Journal Publications

In preparation

1. Assessment of measurement needs for trend detection of water vapor in the lower stratosphere

Submitted

Accepted

In Print

1. Whiteman, David N., Examination of the traditional Raman Lidar technique II: evaluating the ratios for water vapor and aerosols: erratum, Appl. Opt. **64**(5), 1265-1269 (2025)

2. Whiteman, David N., Marcos Andrade, Ricardo Forno, Rubén Mamani-Paco, Isabel Moreno, Fernando Velarde, Luis Blacutt, Rene Gutierrez, Fabricio Avila, Monica Pozadas, Decker Guzman, Richard Peltier, Adrian Acarapi, Ayomiposi Ajayi, Valeria Burgoa, Alan Callaú,Yahuar Benjamin Chambi, Franco Garcia, Samantha Lobatón, Hadijat Oke, Fisayo Okunuga, Belen Peñaloza, Marco Antonio Rivera, Monique Watson, Shayla Reid, Hoven Zou, "Bolivian/U.S Student Atmospheric Field Campaign in the Bolivian Andes", *Revista Boliviana de Física* [online] 2023, vol.42, n.42, pp.3-11. ISSN 1562-3823 (published in 2024 but assigned a 2023 publication date due to requirements at RFB)

3. Whiteman, D. N., K. Boateng, S. Harbison, H. Oke, A Rappaport, M. Watson, A. Ajayi, O. Okunuga, R. Forno, M. Andrade, Breakdown of a Nocturnal Inversion Measured with a Low-Cost Tethersonde System: a High School Student Experiment, Bulletin of the American Meteorological Society, print publication Feb 1, 2023, online publication March 2, 2023, DOI: https://doi.org/10.1175/BAMS-D-21-0150.1

4. Whiteman David N., Di Girolamo Paolo, Behrendt Andreas, Wulfmeyer Volker, Franco Noemi, Statistical Analysis of Simulated Spaceborne Thermodynamics Lidar Measurements in the Planetary Boundary Layer, Frontiers in Remote Sensing, Vol 3, 2022, https://www.frontiersin.org/article/10.3389/frsen.2022.810032, doi 10.3389/frsen.2022.810032, ISSN 2673-6187

5. Whiteman, D. N., C. Ichoku, R. Sakai, A. Flores, J. D. Fuentes, W. R. Stockwell, R. M. Fitzgerald, B. Demoz, R. Delgado, A. Stein, J. McQueen, J. T. Sullivan, J. Boyle, R. Auvil, D. Krask, S. Chiao, Planetary Boundary Layer Workshop for Underrepresented Students in the Time of COVID. WWW document, http://www.igeoscied.org/wp-content/uploads/2021/02/February2021Newsletter.pdf, (last retrieved May, 2021)

6. Whiteman, D. N., Daniel Pérez-Ramírez, Igor Veselovskii, Peter Colarco, Virginie Buchard, Retrievals of aerosol microphysics from simulations of spaceborne multiwavelength lidar measurements, In Journal of Quantitative Spectroscopy and Radiative Transfer, Volume 205, 2018, Pages 27-39, ISSN 0022-4073, (2018) https://doi.org/10.1016/j.jqsrt.2017.09.009. (http://www.sciencedirect.com/science/article/pii/S0022407317306398)

7. Whiteman, D. N., Demetrius D. Venable, Monique Walker, Martin Cadirola,Tetsu Sakai, Igor Veselovskii, Assessing the Temperature Dependence of Narrow-Band Raman Water Vapor Lidar Measurements – A Practical Approach, Applied Optics Vol. 52, Iss. 22, pp. 5376–5384 (2013).

8. Whiteman, D. N., Cadirola, M., Venable, D., Calhoun, M., Miloshevich, L., Vermeesch, K., Twigg, L., Dirisu, A., Hurst, D., Hall, E., Jordan, A., and Vömel, H.: Correction technique for Raman water vapor lidar signal-dependent bias and suitability for water vapor trend monitoring

in the upper troposphere, Atmos. Meas. Tech., 5, 2893-2916, doi:10.5194/amt-5-2893-2012, 2012.

9. Whiteman, D. N., K. C. Vermeesch, L. D. Oman, and E. C. Weatherhead (2011), The relative importance of random error and observation frequency in detecting trends in upper tropospheric water vapor, J. Geophys. Res., 116, D21118, doi:10.1029/2011JD016610.

10. Whiteman, D. N., D. Venable, E. Landulfo, Comments on "Accuracy of Raman lidar water vapor calibration and its applicability to long-term measurements", Applied Optics Vol. 50, Iss. 15, pp. 2170–2176 (2011)

11. Whiteman, David N., Kurt Rush, Scott Rabenhorst, Wayne Welch, Martin Cadirola, Gerry McIntire, Felicita Russo, Mariana Adam, Demetrius Venable and Rasheen Connell, Igor Veselovskii, Ricardo Forno, Bernd Mielke and Bernhard Stein, Thierry Leblanc and Stuart McDermid, Holger Vömel, Airborne and Ground-based measurements using a High-Performance Raman Lidar, J. Atmos. Ocean. Tech. doi:10.1175/2010JTECHA1391.1 (2010).

12. Whiteman, D.N., I. Veselovskii, M. Cadirola, K. Rush, J. Comer, J. Potter, R. Tola, Demonstration Measurements of Water Vapor, Cirrus Clouds, and Carbon Dioxide Using a High-Performance Raman Lidar, J. Atmos. Ocean. Tech., 24 (8), 1377-1388 (2007).

13. Whiteman, D. N., F. Russo, L. Miloshevich, B. Demoz, Z. Wang, I. Veselovskii, H. Voemel, S. Hannon, B. Lesht, F. Schmidlin, A. Gambacorta, C. Barnet, Analysis of Raman lidar and radiosonde measurements from the AWEX-G field campaign and its relation to Aqua validation, J. Geophys. Res., 111, D09S09, doi:10.1029/2005JD006429 (2006).

14. Whiteman, D. N., B. Demoz, P. Di Girolamo, J. Comer, I. Veselovskii, K. Evans, Z. Wang, M. Cadirola, K. Rush, G. Schwemmer, B. Gentry, S. H. Melfi, B. Mielke, D. Venable, T. Van Hove, Raman Water Vapor Lidar Measurements During the International H2O Project. I. Instrumentation and Analysis Techniques, J. Atmos. Oceanic Technol., 23, 157-169 (2006).

15. Whiteman, D. N., B. Demoz, P. Di Girolamo, J. Comer, I. Veselovskii, K. Evans, Z. Wang, D. Sabatino, G. Schwemmer, B. Gentry, R-F. Lin, A. Behrendt, V. Wulfmeyer, E. Browell, R. Ferrare, S. Ismail, J. Wang, Raman Water Vapor Lidar Measurements During the International H2O Project. II. Case Studies, J. Atmos. Oceanic Technol., 23, 170-183 (2006).

16. Whiteman D. N., B. Demoz, Z. Wang (2004), Subtropical cirrus cloud extinction to backscatter ratios measured by Raman Lidar during CAMEX-3, Geophys. Res. Lett., 31, L12105, doi:10.1029/2004GL020003.

17. Whiteman, David N, Examination of the traditional Raman lidar technique. I. Evaluating the temperature-dependent lidar equations, Applied Optics, 42, No. 15, 2571-2592 (2003a).

18. Whiteman, David N., Examination of the traditional Raman lidar technique. II. Evaluating the ratios for water vapor and aerosols, Applied Optics, 42, No. 15, 2593-2608 (2003b).

19. Whiteman, D. N., K. D. Evans, B. Demoz, D. O'C. Starr, E. Eloranta, D. Tobin, W. Feltz, G. J. Jedlovec, S. I. Gutman, G. K. Schwemmer, M. Cadirola, S. H. Melfi, F. J. Schmidlin, Raman lidar measurements of water vapor and cirrus clouds during the passage of hurricane Bonnie, J. of Geophys. Res., 106, No. D6, 5211-5225. (2001)

20. Whiteman, D. N., G. Schwemmer, T. Berkoff, H. Plotkin, L. Ramos-Izquierdo, G. Pappalardo, Performance modeling of an airborne Raman water vapor lidar, Appl Opt, 40, No. 3, 375-390. (2001)

21. Whiteman, D. N., S. H. Melfi, Cloud liquid water, mean droplet radius and number density measurements using a Raman lidar, J. Geophys. Res., Vol 104 No. D24, 31411-31419 (1999)

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Dr. David N. Whiteman received his B. A. in Physics cum laude from Williams College in 1979. Shortly thereafter, he joined NASA-Goddard Space Flight Center. In 1980, he began working with Dr. S. Harvey Melfi, one of the pioneers of atmospheric measurements using Raman lidar. Together in 1985 they demonstrated the first meteorologically useful measurements of the evolution of water vapor in the troposphere using Raman Lidar which were presented on the cover of the Bulletin of the American Meteorological Society. In 2000, Dr. Whiteman received his PhD in physics from the University of Maryland, Baltimore County with research entitled "Investigation of cloud properties using a Raman Lidar" and was awarded the 2001 Allen Prize by the Optical Society of America for best graduate student research. While at NASA, Dr. Whiteman worked in the design, implementation, field deployment and analysis of lidar systems and other instrumentation for atmospheric measurements including the first mobile stratospheric ozone lidar system (STROZ-LITE), several versions of water vapor Raman lidars including the Scanning Raman Lidar, Raman Airborne Spectroscopic Lidar (RASL) and ALVICE (Atmospheric Laboratory for Validation, Interagency Cooperation, and Education) and ACE Multiwavelength Lidar Optical Data Simulator systems. He has successfully deployed lidar systems and various other atmospheric instruments to more than 25 field experiments in the United States and abroad. He has organized and led several atmospheric field campaigns including the AIRS Water Vapor Experiment-Ground (AWEX-G) held in 2003 at the Department of Energy/Southern Great Plains site and the series of Water Vapor Variability Satellite/Sondes (WAVES) campaigns held in 2006 – 2012 at the Howard University Research Campus in Beltsville, MD. He has developed new lidar remote sensing techniques including ones for retrieving both warm and cold cloud physical properties using Raman lidar. He has been a member of the American Meteorological Society's Committee on Laser Atmospheric Sensing, was the chairman of the first International Raman Lidar Techniques Workshop held at NASA/GSFC in 2004, served on the International Organizing Committees of four Latin American Lidar Workshops held in Ilha Bella, Brazil, Buenos Aires, Argentina, La Paz, Bolivia and Pucon, Chile, is a member of the Global Climate Observing System (GCOS) Working Group on Atmospheric Reference Observations and member of the GCOS Reference Upper Air Network (GRUAN) Task Team investigating measurement needs for GRUAN. He organized and chaired the Network for the Detection of Atmospheric Composition Change (NDACC) Raman water vapor calibration workshop held in Greenbelt, MD in May, 2010. Dr. Whiteman was also involved in organizing the 2014 World Meteorological Organization (WMO)/GRUAN International Coordination Meeting held in Greenbelt, MD. Dr. Whiteman is the sole US representative on the International Steering Committee for the WMO Global Atmospheric Watch (GAW) site at Mt. Chacaltaya in Bolivia. He has received numerous NASA awards for service including the 2008 Robert H. Goddard Award for Science. Dr. Whiteman retired from NASA in 2017 and is now a senior research scientist at Howard University in Washington, DC. As a consultant, Dr. Whiteman has recently worked on two NASA contracts involving spaceborne lidar simulations and has served on a proposal preparation team responding to a NASA EVS3 opportunity. Dr. Whiteman recently was awarded a Fulbright Fellowship for research and teaching in Bolivia where he will continue a long-standing collaboration in the study of pollutants in the high Andes mountains and how they impact the measurements of the world's

highest elevation Global Atmosphere Watch station at Mt. Chacaltaya. According to google scholar, Dr. David N. Whiteman is author or co-author more than 370 citable publications of which more than 100 are refereed journal articles. His publications have been cited over 8400 times and his overall h-index is 47 ranking him 5th highest among Howard University scientists according to the Alper-Doger Scientific Index.