

Peter Colarco

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Education

2002, Ph.D. Astrophysical, Planetary, and Atmospheric Sciences, University of Colorado
2000, M.S. Astrophysical, Planetary, and Atmospheric Sciences, University of Colorado
1997, M.S. Physics, Creighton University
1993, B.S. Physics and Astronomy, University of Iowa

Employment

2003 – Present, Research Associate, Earth System Science Interdisciplinary Center, University of Maryland, NASA Goddard Space Flight Center
2002 – Present, Adjunct Faculty, Program in Atmospheric and Oceanic Sciences, University of Colorado, Boulder
2002 – 2003, Research Associate/Goddard Visiting Fellow, Goddard Earth Sciences and Technology Center/University of Maryland, Baltimore County, NASA Goddard Space Flight Center
1997 – 2002, Graduate Research Assistant, Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder
1995 – 1997, Teaching Fellow, Department of Physics, Creighton University
1994 – 1995, Technical Support Consultant, Intellitek, Inc., Omaha, NE
1993 – 1994, Teaching Assistant, Department of Physics and Astronomy, University of Iowa

Funded and Proposed Research

PI: M. Schoeberl, GSFC (Colarco is Co-I), "Atmospheric transport of trace gases and aerosols: Evaluating models and observations," NASA IDS (funded through 2006).
PI: M. Chin, GSFC (Colarco is Co-I), "Global and regional aerosol modeling study: Sources, distributions, and near-term to long-term climate effects," NASA Radiation Sciences Program (funded through 2006).
PI: P. Colarco, UMCP, "Simulations of the Aging of Smoke from African Biomass Burning Plumes and Implications for Remote Sensing and Long-Range Transport of Smoke Aerosols," NASA New Investigator Program (funded through 2007).
PI: D. Allen (Colarco is Co-I), UMCP, "Effects of current and future North American wildland fires on United States air quality," EPA STAR (proposal submitted).
PI: A. da Silva (Colarco is Co-I), "Toward an A-train aerosol assimilation system: Combined assimilation of OMI/MODIS data with real-time radiance monitoring," NASA AURA (proposal submitted).

Refereed Publications

de Almeida Castanho, A.D., J.V. Martins, P.V. Hobbs, P. Artaxo, L. Remer, M. Yamasoe, and P.R. Colarco, "Chemical characterization of aerosols on the East Coast of the United States using aircraft and ground based stations during the CLAMS Experiment," Journal of the Atmospheric Sciences (in press, 2004).
Colarco, P.R., M.R. Schoeberl, B.G. Doddridge, L.T. Marufu, O. Torres, and E.J. Welton, "Entrainment and Optical Properties of an Elevated Forest Fire Plume Transported into the Planetary Boundary Layer," Journal of Geophysical Research; 109, D06203, doi: 10.1029/2003JD004248 (2004).
Barnum, B.H., N.S. Winstead, J. Wesely, A. Hakola, P.R. Colarco, O.B. Toon, P. Ginoux, G. Brooks, L. Hasselbarth, and B. Toth, "Forecasting Dust Storms using the CARMA-Dust Model and MM5 Weather Data," Environmental Modelling and Software; 19 (2), 129-140 (2004).

Refereed Publications (cont.)

- Colarco, P.R., O.B. Toon, J.S. Reid, J.M. Livingston, J.B. Russell, J. Redemann, B. Schmid, H.B. Maring, D. Savoie, E.J. Welton, J.R. Campbell, B.N. Holben, and R. Levy; "Saharan dust transport to the Caribbean during PRIDE: 2. Transport, vertical profiles, and deposition in simulations of in situ and remote sensing observations;" Journal of Geophysical Research; 108 (D19), 8590, doi: 10.1029/2002JD002659 (2003).
- Colarco, P.R., O.B. Toon, and B.N. Holben; "Saharan dust transport to the Caribbean during PRIDE: 1. Influence of dust sources and removal mechanisms on the timing and magnitude of downwind AOD events from simulations of in situ and remote sensing observations;" Journal of Geophysical Research; 108 (D19), 8589, doi:10.1029/2002JD002658 (2003).
- Reid, J.S., J.E. Kinney, D.L. Westphal, B.N. Holben, E.J. Welton, S. Tsay, D.P. Eleuterio, J.R. Campbell, S.A. Christopher, P.R. Colarco, H.H. Jonsson, J.M. Livingston, H.B. Maring, M.L. Meier, P. Pilewskie, J.M. Prospero, E.A. Reid, L.A. Remer, P.B. Russell, D.L. Savoie, A. Smirnov, and D. Tanre, "Analysis of measurements of Saharan dust by airborne and ground-based remote sensing methods during the Puerto Rico Dust Experiment (PRIDE)," Journal of Geophysical Research; 108 (D19), 8586, doi: 10.1029/2002JD002493 (2003).
- Colarco, P.R., O.B. Toon, O. Torres, and P.J. Rasch; "Determining the UV imaginary index of refraction of Saharan dust particles from TOMS data using a three dimensional model of dust transport;" Journal of Geophysical Research; 107 (D16), 4289, doi:10.1029/2001JD000903 (2002).
- Griñi, A., C.S. Zender, and P.R. Colarco, "Saltation sandblasting behavior during mineral dust aerosol production;" Geophysical Research Letters; 29 (18), 1868, doi: 10.1029/2002GL015248 (2002).
- Betts, W; Bieser, F; Bossingham, R; Botlo, M; Cherney, M; Chrin, J; Colarco, P; Crawford, H; Diaz, H; Dao, K; Greiner, D E; Hjort, E L; Jacobson, S; Jared, R C; Judd, E; Klein, S R; Lebedev, A N; LeVine, M J; Lindenstruth, V; Lisa, M A; Marks, K; McParland, C; McShane, T S; Meier, J; Nguyen, M T; Olson, D L; Sakrejda, I; Schambach, J; Scheetz, R A; Stone, N T B; Tull, E E; Visser, G; Vu, C; Wieman, H; Yee, E; "Results from the STAR TPC System Test;" IEEE Transactions on Nuclear Science; 44:592 (1997).
- Meier, J; Burke, R; Cherney, M; Colarco, P; Chrin, J; Gross, J; McShane, T; Teeter, P; Barale, P; Bieser, F; Hunter, J; Jacobson, S; Klein, S; McParland, C; "STAR Controls System;" published in the transactions from ICALEPS'95 (1996).

Ph.D. Thesis

- Colarco, P.R.; Modeling Saharan Dust Emissions, Transport, Deposition, and Optical Properties; Thesis for Ph.D.; advisor: O.B. Toon; University of Colorado (2002).

M.S. Thesis

- Colarco, P.R.; A Model of the $^{12}\text{CO}_2$ Optogalvanic Effect in Human Breath; Thesis for M.S. Physics; advisor: M. Cherney; Creighton University (1997).

Other Publications

- Stofer, K.A., and P.R. Colarco, "Africa to Atlantic: Dust to Dust," Top Story press release for NASA GSFC, hosted at <http://www.gsfc.nasa.gov/feature/2004/0116dust.html> (2004).
- Schmid, B., et al. (Colarco as coauthor), "Measurement and modeling of vertically resolved aerosol optical properties and radiative fluxes over the ARM SGP site during the May 2003 Aerosol IOP," Proceedings of the ARM Science Team, www.arm.gov (in preparation, 2004).
- Colarco, P.R., and O.B. Toon; "Mineral Aerosol Production, Transport, and Removal During ACE-2: Comparisons of an Event Model to Satellite;" Nucleation and Atmospheric Aerosols 2000: Proceedings of the 15th ICNAA; Rolla, MO (2000).

Conference Proceedings

- Wenig, M.O., and P.R. Colarco, "Parameter estimation in atmospheric data sets," presented at the Quadrennial Ozone Symposium, Kos, Greece (2004).
- Matichuk, R.I., O.B. Toon, P.R. Colarco, and J.A. Smith, "Effects of evolving size distributions on biomass burning aerosol properties in southern Africa smoke plumes," presented at the American Geophysical Union spring meeting, Montreal, Quebec (2004).
- Colarco, P., "Simulations of a Siberian Smoke Plume Observed over Oklahoma during the ARM IOP," presented at ARM Science Team meeting, Albuquerque, NM (2004).
- Colarco, P., A. da Silva, P. Ginoux, and M. Chin, "Dust emissions, transport, and deposition simulated with the NASA finite-volume general circulation model," presented at the American Geophysical Union fall meeting, San Francisco, CA (2003).
- Welton, E.J., P. Ginoux, P. Colarco, M. Chin, J.D. Spinhirne, S.P. Palm, D. Hlavka, and W. Hart, "New measurements of aerosol vertical structure from space using the NASA geoscience laser altimeter system (GLAS): Applications for aerosol transport models," presented at the American Geophysical Union fall meeting, San Francisco, CA (2003).
- Schmid, B., et al. (Colarco as coauthor), "Measurement and modeling vertically resolved aerosol optical properties and radiative fluxes over the ARM SGP site," presented at the American Geophysical Union fall meeting, San Francisco, CA (2003).
- Colarco, P.R., M.R. Schoeberl, B.G. Doddridge, L.T. Marufu, E.J. Welton, O. Torres, and B. Schmid, "International transport of boreal forest fire smoke emissions: Examples and simulations," presented at ACCESS/Gordon Research Conference on Atmospheric Chemistry, Big Sky, MT (2003).
- Colarco, P.R., and O.B. Toon, "Long-range transport of mineral dust, sea salt, and smoke aerosols and their impacts on CRYSTAL-FACE," presented at the joint American Geophysical Union – European Geophysical Society meeting, Nice, France (2003).
- Colarco, P.R., M.R. Schoeberl, B.G. Doddridge, E.J. Welton, and O. Torres, "Dynamical and microphysical analysis of transnational pollutant transport over the eastern United States," presented at the joint American Geophysical Union – European Geophysical Society meeting, Nice, France (2003).
- Madry, W., B. Toon, and P. Colarco, "Sea salt generation and transport validations," presented at the joint American Geophysical Union – European Geophysical Society, Nice, France (2003).
- Colarco, P.R., and O.B. Toon, "Simulations of Dust, Smoke, and Sea Salt Aerosols during CRYSTAL-FACE," presented at the CRYSTAL-FACE science team meeting, Salt Lake City, UT (2003).
- Russel, P., et al. (Colarco is a coauthor), "Satellite-Sunphotometer Studies of Aerosol and Gas Roles in Climate-Chemistry-Biosphere Interactions: Results from PRIDE, SAFARI-2000, and ACE-Asia," presented at EOS-IWG meeting, Ellicott City, MD (2002).
- Colarco, P.R., and O.B. Toon, "Dust Vertical Distributions Simulated During the Puerto Rico Dust Experiment and the Relationship to Transport and Removal Processes," presented at the American Geophysical Union fall meeting, San Francisco, CA (2002).
- Madry, W.L., O.B. Toon, and P.R. Colarco, "Modeling Sea Salt Optical Depth: Generation, Transport, and Hysteresis," presented at the American Geophysical Union fall meeting, San Francisco, CA (2002).
- Barnum, B.H., N.S. Winstead, J. Wesely, A. Hakola, P. Colarco, O.B. Toon, P. Ginoux, G. Brooks, L.M. Hasselbarth, B. Toth, and R. Sterner, "Forecasting Dust Storms Using the CARMA Dust Model and MM5 Weather Data," Presented at the American Geophysical Union fall meeting, San Francisco, CA (2002).
- Colarco, P.R., and O.B. Toon, "Dust aerosol size distribution and deposition to the North Atlantic: Results of a simulation testing source schemes and constrained by TOMS," presented at the American Geophysical Union fall meeting, San Francisco, CA (2001).
- Colarco, P.R., and O.B. Toon, "Determining the UV Imaginary Refractive Index of Saharan Dust using EP-TOMS Data and a Dust Transport Model," presented at the TOMS Science Team meeting, Greenbelt, MD (2001).
- Colarco, P.R., and O.B. Toon, "Dust Aerosol Deposition to the North Atlantic: Results of a Simulation Testing Source Schemes and Constrained by AERONET and TOMS," presented at the International Association of Meteorology and Atmospheric Sciences meeting; Innsbruck, Austria (2001).

Conference Proceedings (cont.)

- Colarco, P.R., and O.B. Toon; "Remote Sensing of Mineral Dust from Space: Inferring Single Scatter Albedo and Optical Depth from a Simulation of Dust Transport During the ACE-2 Experiment," presented at the American Meteorological Society annual meeting; Albuquerque, NM (2001).
- Colarco, P.R., and O.B. Toon, "Mineral Dust Aerosols Over the Canary Islands During ACE-2: Comparison of Observations to a Numerical Simulation and Implications for Remote Sensing," presented at the American Geophysical Union fall meeting, San Francisco, CA (2000).
- Colarco, P.R., and O.B. Toon, "Three Dimensional Model Simulations of the Desert Aerosol Lifecycle: Comparisons to Ground and Satellite Observations during ACE-2," presented at the ICTP Summer Conference on Chemistry-Climate Interactions, Trieste, Italy (2000).
- Colarco, P.R., and O.B. Toon, "Satellite Validation of a Three Dimensional Model of Dust Emissions and Transport during the ACE-2 Campaign," presented at the American Geophysical Union spring meeting, Washington, D.C. (2000).
- Colarco, P.R., I.N. Sokolik, and O.B. Toon, "Modeling the Production and Transport of Mineral Aerosols during the ACE-II Field Campaign: Comparisons to Observations," presented at the IUGG 1999 meeting, Birmingham, UK (1999).
- Colarco, P.R., I.N. Sokolik, and O.B. Toon; "Three dimensional modeling the evolution of the dust particle size distribution during the ACE-II field campaign;" presented at the Workshop on Mineral Dust; Boulder, CO (1999).
- Colarco, P.R., I.N. Sokolik, and O.B. Toon; "Modeling Dust Emissions and Transport from the Western Sahara Desert;" presented at the American Geophysical Union Fall meeting; San Francisco (1998).
- Colarco, P.R., I.N. Sokolik, and O.B. Toon, "Modeling Saharan Dust Emissions and Optical Properties," presented at the IGAC Joint International Symposium on Global Atmospheric Chemistry, Seattle, (1998).
- Colarco, P.R., I.N. Sokolik, and O.B. Toon, "Modeling Saharan Dust Emissions and Optical Properties," presented at the American Geophysical Union Spring meeting, Boston (1998).
- Colarco, P. and M. Colgan, "A Model of the CO₂ Optogalvanic Effect in Human Breath," presented at the American Physical Society Spring meeting, Washington, D.C. (1997).

Seminars Given

- "Comparisons of the Simulated Atmospheric Aerosol Lifecycle with the NASA Finite-Volume General Circulation Model to MODIS, TOMS, and Field Data," given at NASA GSFC Laboratory for Atmospheres seminar series, August 25, 2004 (invited).
- "Combined use of Satellite Data and Transport Models to Understand the Composition and Distribution of Climatically Important Aerosols," given at Program in Atmospheric and Oceanic Sciences/Laboratory for Atmospheric and Space Physics, University of Colorado, April 8, 2004 (invited).
- "Simulations of a Siberian Smoke Plume Observed during the ARM IOP," given at NASA GSFC Atmospheric Dynamics and Chemistry Branch seminar series, April 1, 2004.
- "Modeling the lifecycle of desert dust aerosols," given at College of Oceanic and Atmospheric Sciences, Oregon State University, February 5, 2004 (invited).
- "How can aerosol assimilation benefit the community?," given at NASA GSFC, August 29, 2003.
- "Transport of smoke from Canadian forest fires to the surface near Washington, D.C.: Entrainment and optical properties," given at University of Maryland, Earth System Science Interdisciplinary Center seminar series, August 15, 2003, and at NASA GSFC Atmospheric Dynamics and Chemistry Branch seminar series, July 17, 2003.
- "Dynamical and microphysical analysis of transnational pollutant transport over the eastern U.S. from Canadian forest fires," given at NASA GSFC Aerocenter Seminar Series, February 4, 2003, and at University of Maryland, College Park, Department of Meteorology, January 31, 2003.
- "Determining the UV imaginary refractive index of Saharan dust using EP-TOMS data and a dust transport model," given at NASA GSFC, November 2001.

Additional Professional Activities

Cirrus Regional Study of Tropical Anvils and Cirrus Layers – Florida Area Cirrus Experiment, Key West, FL, Mission Weather Forecasting and Flightplanning Assistant, June/July 2002
SAGE III Ozone Loss and Validation Experiment, Kiruna, Sweden, Mission Flightplanning Assistant, December 1999 / January 2000
Gordon Research Conference, Solar Radiation and Climate, attendee, 1998
ACCESS and Gordon Research Conference, Atmospheric Chemistry, poster presenter, 2003

Teaching Experience & Students Advised

Ph.D. Committee for Doctoral Candidate Rebecca Matichuk, University of Colorado, 2004 – Present, mentored at GSFC during June – August, 2004.
Ph.D. Committee for Doctoral Candidate W. Lansing Madry, University of Colorado, 2002 – Present, mentored at GSFC during March – May, 2003.
Teaching Assistant, Atmospheric and Oceanic Sciences, University of Colorado, Fall 1998, Spring 2001
Teaching Fellow, Physics, Creighton University, Fall 1995 – Spring 1997
Teaching Assistant, Physics, University of Iowa, Fall 1993 – Spring 1994

Professional Memberships

American Meteorological Society, 2000 – Present
American Geophysical Union, 1997 – Present

Service

Referee for papers and proposals from Geophysical Research Letters, Journal of Geophysical Research-Atmospheres, Tellus, and NASA
Docent Volunteer, Hands on Science Center, Smithsonian National Museum of American History, Spring 2003 – Present
Student representative to comprehensive exams committee, Program in Atmospheric and Oceanic Sciences, University of Colorado, Fall 2001 – Spring 2002
Student representative to course fees committee, Program in Atmospheric and Oceanic Sciences, University of Colorado, Fall 2000 – Spring 2002
Student representative to admissions committee, Program in Atmospheric and Oceanic Sciences, University of Colorado, Fall 1999 – Spring 2001

Awards Received

American Physical Society Industrial Summer Internship, Alimenterics, Inc., Summer 1996
NASA Earth System Science Fellowship, 1998 – 2001
Outstanding Student Paper Award, American Geophysical Union Fall meeting, 1998

Other Interests

Running, cycling, triathlons, marathons
Bass guitar, guitar