MICHAEL J. NEWCHURCH

Curriculum Vitae

Atmospheric and Earth Science Department
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PROFESSIONAL PREPARATION

Ph.D.	Atmospheric Sciences, Georgia Institute of Technology, 1986
B.S	Industrial Sciences, Colorado State University, 1974

APPOINTMENTS

2007-present	CEO, Air-Quality Remote-Sensing Consulting, LLC
2005-present	Professor, Atmospheric Science Dept., UAH
2000-2005	Associate Professor, Atmospheric Science Dept., UAH
1994-2000	Associate Research Professor, Atmospheric Science Dept., UAH
1991-present	Senior Research Scientist, Earth System Science Ctr., UAH
1988-1994	Adjunct Asst. Professor, Atmospheric Science Dept, UAH
1999-2002	Affiliate Scientist, Atmospheric Chem Div., National Ctr. Atmospheric Research
1998	Visiting Scientist, Atmospheric Chem Div., National Ctr. Atmospheric Research
1991-1993	Senior Atmospheric Scientist, Teledyne Brown Engineering, Huntsville, AL
1988-1990	Mgr, Geo. Remote-Sensing Section, Teledyne Brown Engineering, Huntsville, AL
1986-1988	Atmospheric Scientist, Teledyne Brown Engineering, Huntsville, AL

RESEARCH SUMMARY

- TEMPO Geosynchronous Air-Quality Mission Validation Co-lead
- *Atmospheric Chemistry:* Chief Scientist: Tropospheric Ozone Lidar Network, TOLNet.
- *Lidar:* Measured ozone profiles with UV DIAL, aerosol profiles with elastic backscatter, wind and aerosol profiles with coherent Doppler wind and aerosol lidar in the RAPCD laboratory. Founding member and PI of the Tropospheric Ozone Lidar Network, TOLNet. Member of Network for Detection of Atmospheric Composition Change, NDACC.
- *Airborne in-situ measurements:* Measured PBL distributions of O_3, NO_2, PM2.5, and

meteorological variables from an experimental, amphibious aircraft in a variety of environments, including Gulf shoreline, Lake Michigan lakeshore, and SEUS continental.

- *Satellite Remote Sensing:* Retrieved and validated trace gases (ozone, NO_2, halogens et al.) and aerosol concentrations from numerous satellite (GEO-XO/ACX, TEMPO, OMPS, OMI, TOMS, SAGE, HALOE, AIRS, ATMOS, POAM, and SBUV) instruments and ground-based (Dobson, Brewer, Umkehr, ozonesonde) systems.
- *Trend Analyses:* Reported the first stage of recovery of the stratospheric ozone layer and quantified the degree and significance of ozone recovery in the upper and lower stratosphere in mid-latitudes, high southern latitudes, and in the Antarctic ozone hole.
- *Trace Gas Measurements:* Supervised the design and implementation of an extractive cryocooled inert preconcentration instrument with FTIR spectroscopy for autonomous measurements of atmospheric organics.
- *Laser Propagation:* Modeled the effects of optical systems (lasers, retroreflectors) and atmospheric properties (refraction, turbulence, scattering, absorption) on laser beam propagation over arbitrary slant ranges, especially between ground-based and satellite-based systems.

PROFESSIONAL ACTIVITIES

- 2024 Recipient of NASA Exceptional Public Service Medal.
- $18.6M total research sponsored by NASA, NOAA, NSF, DOE, NRL, EPA, DOD.
- Pilot of experimental, amphibious aircraft for trace gas and aerosol measurements.
- Founder, PI, now Chief Scientist: Tropospheric Ozone Lidar Network (TOLNet).
- Co-I: Tropospheric Emissions: Monitoring of Pollution (TEMPO)
- Scientific Director, Huntsville Ozonesonde Station, 1999-2019..
- Science Team Memberships: TEMPO, TOLNet, GEO-CAPE, NPP, OMI, AIRS, SAGE I,II,&III, TOMS, ATLAS, ATMOS, POAM.
- Sigma Xi Researcher of the Year 2004, UAH Chapter.
- Invited plenary lecturer to Quadrennial Ozone Symposium (2004), American Geophysical Union (2003), and Gordon Research Conference on Atmospheric Chemistry (2003).
- Member, External Advisory Board, NOAA Cooperative Remote Sensing Science and Technology Center, 2002-2007.
- Member, NASA Space Station Utilization Advisory Subcommittee (SSUAS) 1999-2003.
- Advisor to NASA Earth Science Research Director reviewing South Korean National Atmospheric Science Research program (1998).
- Invited to International Ozone Commission Trends Panel (1998).
- Assistant Mission Scientist, ATLAS-2 (1993) and ATLAS-3 (1994).
- NASA Group Achievement Award for ATLAS-2 (1993), ATLAS-3 (1994), ICARTT (2005), TOMS (2008), TOLNet (2019)
- Taught 8 undergraduate and 25 graduate courses at UAH.
- Developed Atmospheric Chemistry graduate curriculum at UAH.
- Advisor to 28 undergraduate students, 16 graduate students, 2 Post-docs, 4 MS

degrees, and 7 PhDs.
- Reviewer of papers submitted to the Atmospheric Environment, Journal of Geophysical Research, Geophysical Research Letters, Journal of Atmospheric Chemistry, Journal of Atmospheric Chemistry and Physics, and Ocean-Atmospheres.
- Reviewer of proposals submitted to NASA, NSF, and NSERC Canada.
- Member, Peer-review of LaRC's Atmospheric Composition within the Science Directorate (2008).

PROFESSIONAL ORGANIZATIONS

- American Geophysical Union (member 25 years)
- American Meteorological Society
- American Chemical Society
- American Academy for the Advancement of Science
- American Institute of Aeronautics and Astronautics
- Optical Society of America
- Sigma Xi

PUBLICATIONS, M. J. NEWCHURCH

Many available at **http://nsstc.uah.edu/atmchem/**

119. Acdan, J. J. M., and Coauthors, 2024: Evaluation of WRF-Chem air quality forecasts during the AEROMMA and STAQS 2023 field campaigns. *J Air Waste Manag Assoc*, **74,** 783-803.
118. Kuang, S., and Coauthors, 2024: Mobile observations of ozone and aerosols in Alabama: Southeastern US summer Pollution and coastal variability. *Journal of Geophysical Research: Atmospheres*, **129,** e2023JD039514.
117. McKinney, T., N. Perlaky, M. Newchurch, and B. Brown, 2023a: Insights on polar day Antarctica radio propagation using amateur radio beacons on circumnavigating balloons. *Atmosphere*, **14,** 1118.
116. McKinney, T., N. Perlaky, A. Crawford, B. Brown, and M. J. Newchurch, 2023b: Methodology, deployment, and performance of pico balloons in Antarctica. *Journal of Atmospheric and Oceanic Technology*, **40,** 1277-1290.
115. McKinney, T., and Coauthors, 2023c: Around the World They Go: Circumnavigating Balloon Satellites! *BAMS*.
114. Mettig, N., and Coauthors, 2022: Combined UV and IR ozone profile retrieval from TROPOMI and CrIS measurements. *Atmospheric Measurement Techniques*, **15,** 2955-2978.
113. Naeger, A. R., M. Newchurch, X. Liu, and K. Chance, 2022b: The NASA Tropospheric Emissions: Monitoring of Pollution (TEMPO) Satellite Mission: Early Adopters Program and Applied Science Activities. I. 2022, Ed.
112. Wang, B., S. Kuang, G. G. Pfister, A. P. Biazar, M. J. Newchurch, R. R. Buchholz, and A. O. N. Langford, 2022: Vertical Accumulation of Ozone and Aerosol during the 2016 Southeastern US Wildfires. *Authorea Preprints*.
111. Naeger, A. R., and Coauthors, 2021: Revolutionary Air-Pollution Applications from Future Tropospheric Emissions: Monitoring of Pollution (TEMPO) Observations. *Bulletin of the American Meteorological Society*, **102,** E1735-E1741.
110. Su, J., and Coauthors, 2021: Tropospheric NO2 Measurements Using a Three-wavelength Optical Parametric Oscillator Differential Absorption Lidar. *Atmos. Meas. Tech. Discuss.*, **2021,** 1-24.
109. Wang, B., S. Kuang, G. G. Pfister, A. Pour-Biazar, R. R. Buchholz, A. O. Langford, and M. J. Newchurch, 2021: Impact of the 2016 Southeastern US Wildfires on the Vertical Distribution of Ozone and Aerosol at Huntsville, Alabama. *Journal of Geophysical Research: Atmospheres*, **126**.
108. Kuang, S., and Coauthors, 2020: Evaluation of UV aerosol retrievals from an ozone lidar. *Atmospheric Measurement Techniques*, **13,** 5277-5292.
107. Huang, G., M. J. Newchurch, S. Kuang, and H. Ouwersloot, 2019: A Case Study of Ozone Diurnal Variation in the Convective Boundary Layer in the Southeastern United States Using Multiple Observations and Large-Eddy Simulation. *Climate*, **7,** 53.
106. Kim, J., and Coauthors, 2019: New Era of Air Quality Monitoring from Space: Geostationary Environment Monitoring Spectrometer (GEMS). *Bulletin of the American Meteorological Society*, **101,** E1-E22.

105. Reid, J. S., and Coauthors, 2019: Observations and hypotheses related to low to middle free tropospheric aerosol, water vapor and altocumulus cloud layers within convective weather regimes: a SEAC4RS case study. *Atmospheric Chemistry and Physics*, **19,** 11413-11442.
104. Johnson, M. S., and Coauthors, 2018: Evaluation of potential sources of a priori ozone profiles for TEMPO tropospheric ozone retrievals. *Atmospheric Measurement Techniques*, **11,** 3457-3477.
103. Langford, A. O., and Coauthors, 2018: Coordinated profiling of stratospheric intrusions and transported pollution by the Tropospheric Ozone Lidar Network (TOLNet) and NASA Alpha Jet experiment (AJAX): Observations and comparison to HYSPLIT, RAQMS, and FLEXPART. *Atmospheric Environment*.
102. Leblanc, T., and Coauthors, 2018a: Validation of the TOLNet lidars: The southern California ozone observation project (scoop). *Atmospheric measurement techniques*, **11,** 6137-6162.
101. De Young, R., W. Carrion, R. Ganoe, D. Pliutau, G. Gronoff, T. Berkoff, and S. Kuang, 2017: Langley mobile ozone lidar: ozone and aerosol atmospheric profiling for air quality research. *Applied optics*, **56,** 721-730.
100. Huang, G., and Coauthors, 2017: Validation of 10-year SAO OMI Ozone Profile (PROFOZ) product using ozonesonde observations. *Atmospheric Measurement Techniques*, **10,** 2455-2475.
99. Kuang, S., M. J. Newchurch, A. M. Thompson, R. M. Stauffer, B. J. Johnson, and L. Wang, 2017b: Ozone variability and anomalies observed during SENEX and SEAC4RS campaigns in 2013. *Journal of Geophysical Research: Atmospheres*, **122,** 11,227-211,241.
98. Kuang, S., and Coauthors, 2017c: Summertime tropospheric ozone enhancement associated with a cold front passage due to stratosphere-to-troposphere transport and biomass burning: Simultaneous ground-based lidar and airborne measurements. *Journal of Geophysical Research: Atmospheres*, **122,** 1293-1311.
97. Reid, J. S., and Coauthors, 2017: Ground-based High Spectral Resolution Lidar observation of aerosol vertical distribution in the summertime Southeast United States. *Journal of Geophysical Research: Atmospheres*, **122,** 2970-3004.
96. Travis, K. R., Jacob, Daniel J., Keller, Christoph A., Kuang, Shi, Lin, Jintai, Newchurch, Michael J., Thompson, Anne M., 2017: Resolving ozone vertical gradients in air quality models. *Atmospheric Chemistry and Physics Discussions***,** 1-18.
95. Wang, L., and Coauthors, 2017b: Quantifying TOLNet ozone lidar accuracy during the 2014 DISCOVER-AQ and FRAPPÉ campaigns. *Atmospheric Measurement Techniques*, **10,** 3865-3876.
94. Zoogman, P., and Coauthors, 2017: Tropospheric emissions: Monitoring of pollution (TEMPO). *Journal of Quantitative Spectroscopy and Radiative Transfer*, **186,** 17-39.
93. Johnson, M., S. Kuang, L. Wang, and M. Newchurch, 2016a: Evaluating Summer-Time Ozone Enhancement Events in the Southeast United States. *Atmosphere*, **7,** 108.
92. Buckley, P. I., D. A. Bowdle, and M. J. Newchurch, 2015: Extractive FTIR spectroscopy with cryogen-free low-temperature inert preconcentration for

autonomous measurements of atmospheric organics: 1: Instrument development and preliminary performance. *Applied Optics*, **54,** 2908-2921.

91. Huang, G., M. J. Newchurch, S. Kuang, P. I. Buckley, W. Cantrell, and L. Wang, 2015: Definition and determination of ozone laminae using Continuous Wavelet Transform (CWT) analysis. *Atmospheric Environment*, **104,** 125-131.
90. Wang, L., and Coauthors, 2015a: Evaluation of lightning-induced tropospheric ozone enhancements observed by ozone lidar and simulated by WRF/Chem. *Atmospheric Environment*, **115,** 185-191.
89. Koshak, W., H. Peterson, A. Biazar, M. Khan, and L. Wang, 2014: The NASA Lightning Nitrogen Oxides Model (LNOM): application to air quality modeling. *Atmospheric Research*, **135,** 363-369.
88. Kuang, S., M. J. Newchurch, J. Burris, and X. Liu, 2013a: Ground-based lidar for atmospheric boundary layer ozone measurements. *Applied Optics*, **52,** 3557-3566.
87. Wang, L., and Coauthors, 2013b: Estimating the influence of lightning on upper tropospheric ozone using NLDN lightning data and CMAQ model. *Atmospheric Environment* **67**.
86. Bak, J., J. H. Kim, R. J. D. Spurr, X. Liu, and M. J. Newchurch, 2012: Sensitivity study of ozone retrieval from UV measurements on geostationary platforms. *Remote Sensing of Environment*, **118,** 309-319.
85. Fishman, J., and Coauthors, 2012: The United States' Next Generation of Atmospheric Composition and Coastal Ecosystem Measurements: NASA's Geostationary Coastal and Air Pollution Events (GEO-CAPE) Mission. *Bulletin of the American Meteorological Society*, **93,** 1547–1566.
84. Kuang, S., M. J. Newchurch, J. Burris, L. Wang, K. Knupp, and G. Huang, 2012b: Stratosphere-to-troposphere transport revealed by ground-based lidar and ozonesonde at a midlatitude site. *Journal of Geophysical Research: Atmospheres*, **117**.
83. Szykman, J., and Coauthors, 2012: Profile and remote sensing observation data sets (trace gases and aerosols) for regional-scale model evaluation under the air quality model evaluation international initiative (AQMEII). North American and European perspectives. *EM***,** 22-29.
82. Hogrefe, C., and Coauthors, 2011: An analysis of long-term regional-scale ozone simulations over the Northeastern United States: variability and trends. *Atmospheric Chemistry and Physics*, **11,** 567-582.
81. Kim, J. H., and Coauthors, 2011: Evaluation of Satellite-derived HCHO using statistical methods. *Accepted by ACP Discussion***,** 8003–8025.
80. Kuang, S., J. F. Burris, M. J. Newchurch, S. Johnson, and S. Long, 2011a: Differential Absorption Lidar to Measure Subhourly Variation of Tropospheric Ozone Profiles. *IEEE Transactions on Geoscience and Remote Sensing*, **49,** 557-571.
79. Kuang, S., and Coauthors, 2011c: Nocturnal ozone enhancement in the lower troposphere observed by lidar. *Atmospheric Environment*, **45,** 6078-6084.
78. Lamsal, L. N., and Coauthors, 2011: Application of satellite observations for timely updates to global anthropogenic NOx emission inventories. *Geophysical Research Letters*, **38,** n/a-n/a.

77. Pour-Biazar, A., and Coauthors, 2011: The utilization of satellite observation of ozone and aerosols in providing initial and boundary conditions for regional air-quality studies. *J. Geophys. Res.*, **116,** 1 of 32.
76. Wang, L., M. J. Newchurch, A. Biazar, X. Liu, S. Kuang, and M. Khan, 2011: Evaluating AURA/OMI Ozone Profiles Using Ozonesonde Data and EPA Surface Measurements for August 2006. *Atmospheric Environment*, **45,** 5523-5530.
75. Jonson, J. E., and Coauthors, 2010: A multi-model analysis of vertical ozone profiles. *Atmospheric Chemistry and Physics*, **10,** 5759-5783.
74. Lightner, K. J., W. W. McMillan, K. J. McCann, R. M. Hoff, M. J. Newchurch, E. J. Hintsa, and C. D. Barnet, 2009: Detection of a tropospheric ozone anomaly using a newly developed ozone retrieval algorithm for an up-looking infrared interferometer. *J. Geophys. Res.*, **114,** 1-12.
73. Divakarla, M., and Coauthors, 2008: Evaluation of Atmospheric Infrared Sounder ozone profiles and total ozone retrievals with matched ozonesonde measurements, ECMWF ozone data, and Ozone Monitoring Instrument retrievals. *Journal of Geophysical Research: Atmospheres*, **113,** 1-24.
72. Hopey, J. A., K. A. Fuller, V. Krishnaswamy, D. Bowdle, and M. J. Newchurch, 2008: Fourier transform infrared spectroscopy of size-segregated aerosol deposits on foil substrates. *Appl Opt*, **47,** 2266-2274.
71. Kim, J. H., S. Na, R. V. Martin, K. H. Seo, and M. J. Newchurch, 2008c: Singular value decomposition analyses of tropical tropospheric ozone determined from TOMS. *Geophys. Res. Lett.*, **35**.
70. Nassar, R., and Coauthors, 2008: Validation of Tropospheric Emission Spectrometer (TES) nadir ozone profiles using ozonesonde measurements. *J. Geophys. Res.*, **113,** D15S17.
69. Yang, E.-S., and Coauthors, 2008b: First stage of Antarctic ozone recovery. *Journal of Geophysical Research: Atmospheres*, **113,** 1-16.
68. Cooper, O. R., and Coauthors, 2007: Evidence for a recurring eastern North America upper tropospheric ozone maximum during summer. *J. Geophys. Res.*, **112,** D23304.
67. Jiang, Y. B., and Coauthors, 2007: Validation of Aura Microwave Limb Sounder Ozone by ozonesonde and lidar measurements. *Journal of Geophysical Research: Atmospheres*, **112,** 1-20.
66. Schoeberl, M. R., and Coauthors, 2007: A trajectory-based estimate of the tropospheric ozone column using the residual method. *Journal of Geophysical Research: Atmospheres*, **112**.
65. Tarasick, D. W., and Coauthors, 2007: Comparison of Canadian air quality forecast models with tropospheric ozone profile measurements above midlatitude North America during the IONS/ICARTT campaign: Evidence for stratospheric input. *Journal of Geophysical Research: Atmospheres*, **112,** 1-17.
64. Thompson, A. M., and Coauthors, 2007b: Intercontinental Chemical Transport Experiment Ozonesonde Network Study (IONS) 2004: 1. Summertime upper troposphere/lower stratosphere ozone over northeastern North America. *J. Geophys. Res.*, **112,** D12S12.

63. Yang, Q., and Coauthors, 2007: Midlatitude tropospheric ozone columns derived from the Aura Ozone Monitoring Instrument and Microwave Limb Sounder measurements. *J. Geophys. Res.*, **112,** D20305.
62. Cooper, O. R., and Coauthors, 2006: Large upper tropospheric ozone enhancements above midlatitude North America during summer: In situ evidence from the IONS and MOZAIC ozone measurement network. *J. Geophys. Res.*, **111,** D24S05.
61. Liu, X., K. Chance, C. E. Sioris, T. P. Kurosu, and M. J. Newchurch, 2006a: Intercomparison of GOME, ozonesonde, and SAGE II measurements of ozone: Demonstration of the need to homogenize available ozonesonde data sets. *J. Geophys. Res.*, **111,** D14305.
60. Liu, X., and Coauthors, 2006b: Correction to "First directly retrieved global distribution of tropospheric column ozone from GOME: Comparison with the GEOS-CHEM model". *J. Geophys. Res*, **111,** D10399.
59. Liu, X., and Coauthors, 2006c: First directly retrieved global distribution of tropospheric column ozone from GOME: Comparison with the GEOS-CHEM model. *J. Geophys. Res.*, **111,** D02308.
58. Yang, E. S., and Coauthors, 2006: Attribution of recovery in lower-stratospheric ozone. *Journal of Geophysical Research: Atmospheres*, **111,** 1-21.
57. Cooper, O. R., and Coauthors, 2005: A springtime comparison of tropospheric ozone and transport pathways on the east and west coasts of the United States. *J. Geophys. Res.*, **110,** D05S90.
56. Kim, J. H., S. Na, M. J. Newchurch, and R. V. Martin, 2005: Tropical tropospheric ozone morphology and seasonality seen in satellite and in situ measurements and model calculations. *J. Geophys. Res.*, **110,** D02303.
55. Liu, X., K. Chance, C. E. Sioris, M. J. Newchurch, and T. P. Kurosu, 2005a: A new retrieval method for tropospheric ozone profiles from a ground-based ultraviolet spectrometer. *Appl. Opt.*, **45,** 2352-2359.
54. Liu, X., C. E. Sioris, K. V. Chance, T. P. Kurosu, M. J. Newchurch, R. V. Martin, and P. I. Palmer, 2005b: Mapping tropospheric ozone profiles from an airborne ultraviolet-visible spectrometer. *Applied Optics*, **44,** 3312-3319.
53. Liu, X., K. Chance, C. E. Sioris, R. J. D. Spurr, T. P. Kurosu, R. V. Martin, and M. J. Newchurch, 2005c: Ozone profile and tropospheric ozone retrievals from the Global Ozone Monitoring Experiment: Algorithm description and validation. *Journal of Geophysical Research: Atmospheres*, **110,** 1-19.
52. Polyakov, A. V., Y. M. Timofeyev, D. V. Ionov, Y. A. Virolainen, H. M. Steele, and M. J. Newchurch, 2005: Retrieval of ozone and nitrogen dioxide concentrations from SAGE III measurements using a new algorithm. *J. Geophys. Res.*, **110,** D06303.
51. Virolainen, Y. A., Yu. M. Timofeyev, A. V. Polyakov, H. Steele, K. Drdla, and M. J. Newchurch, 2005a: Simulation of polar stratospheric clouds: 1. Microphysical characteristics. *Atmos. Oceanic Opt.*, **18,** 243-247.
50. Virolainen, Y. A., Yu. M. Timofeyev, A. V. Polyakov, H. Steele, K. Drdla, and M. J. Newchurch, 2005b: Simulation of polar stratospheric clouds: 2. Spectral aerosol extinction coefficient and PSC remote sensing possibilities. *Atmos. Oceanic Opt.*, **18,** 526-530.
48. Yang, E.-S., D. M. Cunnold, M. J. Newchurch, and R. J. Salawitch, 2005a: Change in ozone trends at southern high latitudes. *Geophysical Research Letters*, **32,** 1-5.

47. Cunnold, D. M., E.-S. Yang, M. J. Newchurch, G. C. Reinsel, J. M. Zawodny, and J. M. R. III, 2004: Comment on “Enhanced upper stratospheric ozone: Sign of recovery or solar cycle effect?” by W. Steinbrecht et al. *Journal of Geophysical Research: Atmospheres*, **109,** 1-4.
46. Kim, J. H., S. Na, M. J. Newchurch, and K. J. Ha, 2004: Comparison of Scan-Angle Method and Convective Cloud Differential Method in Retrieving Tropospheric Ozone from TOMS. *Environ. Monit. Assess.*, **92,** 25-33.
45. Liu, X., M. J. Newchurch, R. Loughman, and P. K. Bhartia, 2004a: Errors resulting from assuming opaque Lambertian clouds in TOMS ozone retrieval. *Journal of Quantitative Spectroscopy and Radiative Transfer*, **85,** 337-365.
44. Fetzer, E., and Coauthors, 2003: AIRS/AMSU/HSB Validation. *IEEE Transactions on Geoscience and Remote Sensing*, **41,** 418-431.
43. Liu, X., M. J. Newchurch, and J. H. Kim, 2003a: Occurrence of ozone anomalies over cloudy areas in TOMS version-7 level-2 data. *Atmos. Chem. Phys. Discuss.*, **3,** 187-223.
42. Newchurch, M. J., D. Sun, J. H. Kim, and X. Liu, 2003d: Tropical tropospheric ozone derived using Clear-Cloudy Pairs (CCP) of TOMS Measurements. *Atmos. Chem. Phys.*, **3,** 683-695.
41. Newchurch, M. J., M. A. Ayoub, S. Oltmans, B. Johnson, and F. J. Schmidlin, 2003f: Vertical distribution of ozone at four sites in the United States. *J. Geophys. Res.*, **108,** 4031.
40. Newchurch, M. J., E. S. Yang, D. M. Cunnold, G. C. Reinsel, J. M. Zawodny, and J. M. Russell, III, 2003h: Evidence for slowdown in stratospheric ozone loss: First stage of ozone recovery. *AGU Journal of Geophysical Research: Atmospheres*, **108,** 4507 - 4519.
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34. Kim, J. H., M. J. Newchurch, and K. Han, 2001a: Distribution of tropical tropospheric ozone determined by the scan-angle method applied to TOMS measurements. *J. Atmos. Sci.*, **58,** 2699-2708.
33. Newchurch, M. J., X. Liu, and J. H. Kim, 2001b: Lower Tropospheric Ozone (LTO) derived from TOMS near mountainous regions. *J. Geophys. Res.*, **106,** 20,403-420,412.

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29. Newchurch, M. J., and Coauthors, 2000e: Upper-stratospheric ozone trends 1979–1998. *Journal of Geophysical Research: Atmospheres*, **105,** 14625-14636.
28. McPeters, R. D., and Coauthors, 1999: Results from the 1995 stratospheric ozone profile intercomparison at Mauna Loa. *J. Geophys. Res.*, **104,** 30,505-530,514.
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25. Kim, J. H., and M. J. Newchurch, 1998: Biomass-burning influence on tropospheric ozone over New Guinea and South America. *Journal of Geophysical Research: Atmospheres*, **103,** 1455-1461.
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23. Rinsland, C. P., and Coauthors, 1998a: ATMOS/ATLAS 3 infrared profile measurements of clouds in the tropical and subtropical upper troposphere. *J. Quant. Spectrosc. Radiat. Transfer*, **60,** 903-919.
22. ——, 1998b: ATMOS/ATLAS 3 infrared profile measurements of trace gases in the November 1994 tropical and subtropical upper troposphere. *J. Quant. Spectrosc. Radiat. Transfer*, **60,** 891-901.
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152. Kuang, S., J. Burris, M. J. Newchurch, S. Johnson, and S. Long, 2009: Sub-hourly Variation of Tropospheric Ozone Profiles Measured by the Huntsville DIAL.
151. Newchurch, M. J., S. Kuang, and J. Burris, 2009a: 10-min Variations in PBL/FT Ozone from DIAL Measurements in Huntsville. *EOS Aura Science Team Meeting*.
150. Newchurch, M. J., L. Wang, A. Biazar, M. Khan, X. Liu, D. Byun, and B. Pierce, 2009b: Application of OMI Ozone Profiles in CMAQ. *EOS Aura Science Team Meeting*.
149. Wang, L., M. J. Newchurch, A. Biazar, M. Khan, and X. Liu, 2009: Application of OMI Ozone Profiles in CMAQ. *4th GEOS-Chem Users' Meeting*.
148. Kim, J.-H., S. Kim, K. J. Ha, and M. J. Newchurch, 2008a: OMI Total-Ozone Anomaly and its Impact on Tropospheric Ozone Retrieval. *EOS Aura ST*.
147. Kim, J., S. Kim, and M. J. Newchurch, 2008b: The Intercomparison of Tropical Tropospheric Compositions Measured from Satellite. *OMI Meeting*.

146. Mount, G. H., and Coauthors, 2008: OMI Validation with the Ground-Based WSU MFDOAS Spectrometer. *EOS AURA ST*.
145. Newchurch, M., and Coauthors, 2008a: Improving Air Quality Forecasts with AURA Observations. *AGU Spring Meeting Abstracts*, A23A-03.
144. Newchurch, M. J., S. Kuang, J. Burris, and S. Johnson, 2008b: DIAL Measurements of Free-Tropospheric Ozone Profiles in Huntsville, AL. *24th International Laser Radar Conference*.
143. Newchurch, M. J., and Coauthors, 2008c: AURA OMI Ozone Profiles for Large-scale CMAQ Boundary Conditions with Lightning Effects RAPCD Ozone LiDAR for Fine-scale Tropospheric Ozone Variations. *EOS Aura ST*.
142. Newchurch, M. J., and Coauthors, 2008d: Experiment to Improve Air-Quality Forecasts with NASA Satellite Observations. *JCSDA 6th Workshop on Satellite Data Assimilation*.
141. Newchurch, M. J., and Coauthors, 2008e: Improvements in Air-Quality Forecasts from Satellite Observations. *Geostationary Coastal and Air Pollution Events Science Definition Planning Workshop*.
140. Yang, E.-S., and Coauthors, 2008a: Antarctic Ozone: Depletion and Recovery. *AGU Spring Meeting Abstracts*, A53A-04.
139. Kim, J. H., M. J. Newchurch, S. Na, S. Kim, and R. V. Martin, 2007: Singular Value Decomposition Analyses of Tropical Tropospheric Ozone Determined from Satellites. *AGU Fall Meeting*.
138. Newchurch, M. J., J. H. Kim, S. Kim, M. Luo, R. Martin, and B. Sauvage, 2007: Tropical Tropospheric Ozone Analyses Measured from TOMS and AURA. *JPL AURA Workshop*.
137. Patrida, F., and Coauthors, 2007: Impact of Atmospheric Aerosols on Nocturnal Boundary Layer Temperatures. *Experimental Program to Stimulate Competitive Research (EPSCoR) Program Review Workshop*.
136. Thompson, A., and Coauthors, 2007a: Insights Into Mega-City Ozone Pollution From the IONS (INTEX Ozonesonde Network Study, 2004 and 2006) Ozonesonde Network. *AGU Spring Meeting Abstracts*, A32A-06.
135. Newchurch, M. J., S. Kuang, J. Burris, and S. Johnson, 2006a: Tropospheric Ozone Measurement Using Differential Absorption LiDAR. *AURA Science Team Meeting*.
134. Newchurch, M. J., and Coauthors, 2006b: Development of a Remote-Sensing Testbed for Tropospheric Air Quality and Winds. *Working Group on Space-Based Lidar Winds*.
133. Newchurch, M. J., and Coauthors, 2006c: Vertical Distribution of Air-Quality Gases and Aerosols. *AGU Spring Meeting*.
132. Chance, K., and Coauthors, 2005: Global Distribution of Tropospheric Ozone from GOME and Comparison with GEOS-CHEM Model Results. *AGU Spring Meeting Abstracts*, A21A-13.
131. Cunnold, D. M., E.-S. Yang, R. J. Salawitch, and M. J. Newchurch, 2005: The Influence of Loss Saturation Effects on the Assessment of Polar Ozone Changes. *AGU Fall Meeting*.
130. Irion, F. W., M. R. Gunson, M. J. Newchurch, and S. Na, 2005a: Ozone Validation for AIRS V4. *AIRS Science Team Meeting*.

129. Irion, F. W., M. J. Newchurch, S. Na, J. Worden, S.-Y. Lee, and M. R. Gunson, 2005b: Upper Tropospheric and Lower Stratospheric Ozone Retrievals from AIRS. *AGU Fall Meeting*.
128. Newchurch, M., and Coauthors, 2005a: Evidence for the End of the Decline in the Stratospheric Ozone Layer. *AGU Spring Meeting Abstracts*, A53B-06.
127. Newchurch, M. J., and Coauthors, 2005b: Tactical-Scale Atmospheric Information System. *The Huntsville Simulation Conference*.
126. ——, 2005c: Where the Terrain Meets the Atmosphere. *Huntsville Terrain Summit*.
125. Yang, E.-S., and Coauthors, 2005b: First Stage of Recovery in the Stratospheric Ozone Layer. *AGU Spring Meeting*.
124. Yang, E.-S., and Coauthors, 2005c: First Stage of Recovery in the Stratospheric Ozone Layer. *AURA Workshop*.
123. Chance, K., and Coauthors, 2004: Ozone Profile Retrieval from GOME. *Quadrennial Ozone Symposium*.
122. Emmitt, G. D., and Coauthors, 2004: Prospectus for a CHEM/CLOUD Experiment Using Multiple Doppler LiDARs in Huntsville, Alabama. *Working Group on Space-Based Lidar Wind*.
121. Liu, X., and Coauthors, 2004b: Direct Tropospheric Ozone Retrieval from GOME. *AGU Fall Meeting*.
120. Liu, X., and Coauthors, 2004c: Ozone Profiles and Tropospheric Ozone from Global Ozone Monitoring Experiment. *Envisat Symposium*.
119. Newchurch, M. J., 2004a: Regional Atmospheric Profiling Center for Discovery (RAPCD at NSSTC). *Homeland Security Department Visit to UAH*.
118. ——, 2004b: The Regional Atmospheric Profiling Center for Discovery (RAPCD). *7th Annual Southeast Ultrafast and High-Resolution Spectroscopy Conference*.
117. Newchurch, M. J., and Coauthors, 2004a: First Stage of Stratospheric Ozone Recovery. *Quadrennial Ozone Symposium*.
116. Newchurch, M. J., and Coauthors, 2004b: Vertical Profiling of Air Pollution at RAPCD. *SPIE 49th Annual Meeting*.
115. Polyakov, A. V., Y. M. Timofeyev, D. V. Ionov, V. S. Kostsov, Y. A. Virolainen, H. M. Steele, and M. J. Newchurch, 2004a: Trace Gas and Aerosol Sounding of the Atmosphere in the Sun Occultation Experiment with SAGE III Device. *SOSST Meeting*.
114. Polyakov, A. V., and Coauthors, 2004b: Retrieval of Trace Gases and Aerosol Components of the Atmosphere from Satellite Occultation Measurements of Solar Radiation by SAGE III Device. *2004 International Symposium of Former USSR Countries on Atmospheric Radiation*.
113. ——, 2004c: Trace Gas and Aerosol Sounding of the Atmosphere in the Sun Occultation Experiment with SAGE III Device. *2004 International Radiation Symposium*.
112. Timofeyev, Y. M., A. V. Polyakov, A. V. Vasilyev, Y. A. Virolainen, M. J. Newchurch, and H. M. Steele, 2004a: Method for Retrieving the Information on Atmospheric Aerosol Characteristics from Limb Scattered Measurements. *2004 Joint AGU-CGU Assembly*.
111. Timofeyev, Y. M., Y. A. Virolainen, A. V. Polyakov, A. V. Vasilyev, H. M. Steele, and M. J. Newchurch, 2004b: Method for Withdrawing the Information on Atmospheric

Aerosol Characteristics from Limb Measurements of Scattered Solar Radiation. *2004 International Symposium of Former USSR Countries on Atmospheric Radiation*.

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109. Timofeyev, Y. M., A. V. Polyakov, A. V. Vasilyev, Y. A. Virolainen, H. M. Steele, and M. J. Newchurch, 2004d: Statistical Approach for the Aerosol Retrieval from Limb Scattered Solar Radiation. *SOSST Meeting*.
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107. Fishman, J., and Coauthors, 2003: Tropospheric Ozone from TOMS: Providing the First Depictions of the Extent of Global Pollution. *AGU Fall Meeting Abstracts*, A11A-05.
106. Irion, F., M. Newchurch, M. Ayoub, A. Eldering, S. Lee, and M. Gunson, 2003: Validation of AIRS Column Ozone Retrievals. *AGU Fall Meeting Abstracts*, H32B-0563.
105. Kim, J. H., S. Na, and M. J. Newchurch, 2003: Evolution of Tropospheric Ozone Derived from Scan Angle Geometry Method (SAM).
104. Lightner, K., W. McMillan, M. Newchurch, and E. Hintsa, 2003: Tropospheric O3 Retrievals from the Baltimore Bomem Atmospheric Emitted Radiance Interferometer (BBAERI) during AIRS Validation. *AGU Fall Meeting Abstracts*, H31A-04.
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102. Newchurch, M. J., R. Loughman, X. Liu, and P. K. Bhartia, 2003a: Ozone Retrieval Errors Associated with Clouds in Total Ozone Mapping Spectrometer (TOMS) Data. *TOMS Science Meeting*.
101. Newchurch, M. J., R. McPeters, J. Logan, and J. H. Kim, 2003b: Report to the TOMS Science Team. *TOMS Science Team Meeting*.
100. Newchurch, M. J., R. Loughman, P. K. Bhartia, and J. H. Kim, 2003c: TOMS Ozone Anomalies and Ozone Retrieval Errors Over Cloudy Areas. *AGU Fall Meeting Supplemental*.
99. Newchurch, M. J., J. Kim, S. Na, and R. Martin, 2003e: Tropical Tropospheric Ozone Morphology and Seasonality Seen in Satellite, Model, and In-Situ Measurements: No Paradox in North Africa. *AGU Fall Meeting Abstracts*, A21D-1014.
98. Newchurch, M. J., M. Ayoub, S. Oltmans, B. Johnson, and F. Schmidlin, 2003g: Vertical Distribution of Ozone at Four Sites in the United States. *TOMS Science Meeting*.
97. Newchurch, M. J., E. Yang, D. Cunnold, G. Reinsel, J. Zawodny, and J. Russell, 2003i: First Stage of Upper-stratospheric Ozone Recovery. *AGU Fall Meeting Abstracts*, A51G-02.
96. Newchurch, M. J., and Coauthors, 2003j: Atmospheric Chemistry at UAH. *Physics Department Meeting*.

95. Timofeyev, Y. M., A. V. Polyakov, V. S. Kostsov, Y. A. Virolainen, H. M. Steele, M. J. Newchurch, and K. Drdla, 2003b: The Use of Statistical Models of Aerosols and Clouds in Remote Sensing. *EGS-AGU-EUG Joint Assembly*, 7503.
94. Yang, E., D. Cunnold, M. J. Newchurch, G. Reinsel, J. Zawodny, and J. Russell, 2003: Rigorous Metric For Quantifying Ozone Recovery. *AGU Fall Meeting Abstracts*, A41D-0718.
93. Ayoub, M., M. J. Newchurch, S. Oltmans, B. Vasel, B. Johnson, and R. McNider, 2002: Daily Variability in Tropospheric Ozone Profiles at TexAQS Within the Context of a US Tropospheric Ozone Climatology. *82nd Annual AMS Spring Meeting*.
92. Liu, X., M. J. Newchurch, and J. Kim, 2002a: Lower-tropospheric Ozone Derived from TOMS V7 Level-2 Data. *AURA Validation Meeting*.
91. ——, 2002b: TOMS Accuracy over High Convective Cloudy Areas. *AURA Validation Meeting*.
90. Liu, X., M. J. Newchurch, R. Loughman, and P. K. Bhartia, 2002c: TOMS Ozone Retrieval Errors Associated with Clouds. *Harvard-Smithsonian Center for Astrophysics*.
89. ——, 2002d: TOMS Ozone Retrieval Sensitivity to Assumption of Lambertian Cloud Surface (II). *AURA Validation Meeting*.
88. Newchurch, M. J., and D. A. Bowdle, 2002: Regional Atmospheric Profiling Center for Discovery (RAPCD) at the Global Hydrology and Climate Center: Status and Plans. *Working Group on Space-Based Lidar Winds*.
87. Newchurch, M. J., M. Ayoub, S. Oltmans, B. Johnson, and F. Schmidlin, 2002a: Vertical Distribution of Ozone at Four Sites in the United States. *Aura Validation Meeting*.
86. Newchurch, M. J., M. Ayoub, S. Oltmans, B. Vasel, B. Johnson, and R. McNider, 2002b: Ozonesondes During TexAQS 2000. *82nd Annual AMS Spring Meeting*.
85. Newchurch, M. J., X. Liu, D. Sun, M. Ayoub, R. Martin, and J. H. Kim, 2002c: Tropical Tropospheric Ozone from TOMS, Sondes, GOME, and Models: How Well do We Understand? *Invited Talk*.
84. Newchurch, M. J., and Coauthors, 2002d: Critical Assessment of TOMS-derived Tropospheric Ozone: Comparisons with Other Measurements and Model Evaluation of Controlling Processes. *AURA Validation Meeting*.
83. Ayoub, M., M. J. Newchurch, S. Oltmans, B. Vasel, B. Johnson, and R. McNider, 2001a: Daily Variability in Tropospheric Ozone Profiles at TexAQS Within the Context of a US Tropospheric Ozone Climatology. *National Space Science and Technology Center*.
82. Ayoub, M., M. J. Newchurch, B. Vasel, B. Johnson, S. Oltmans, and R. McNider, 2001b: Vertical Ozone Profiles at TexAQS 2000. *TexAQS 2000 Science Team Meeting*.
81. Kim, J. H., S. M. Na, and M. J. Newchurch, 2001b: Distribution of Tropospheric Ozone Using Scan-Angle-Geometry Method. *Korean Meteorological Society*.
80. Li, J., D. Cunnold, H. Wang, E. Yang, and M. Newchurch, 2001: Investigation of Upper Stratospheric Ozone Trends and Hemispheric Asymmetries in SAGE II Version 6.0. *AGU Spring Meeting Abstracts*, A52B-04.

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76. Newchurch, M. J., D. Cunnold, and E. Yang, 2001c: Upper-Stratospheric Ozone Trends. *IOC/SPARC Workshop for Understanding Ozone Trends*.
75. Newchurch, M. J., D. Sun, X. Liu, and J. Kim, 2001f: Tropospheric Ozone Distributions from TOMS: A Case for Considering Tropospheric Processes. *IOC/SPARC Workshop for Understanding Ozone Trends*.
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73. Newchurch, M. J., and Coauthors, 2001h: Regional Atmospheric Profiling Center for Discovery (RAPCD): Request for Community Critique. *National Center for Atmospheric Research*.
72. ——, 2001i: Regional Atmospheric Profiling Center for Discovery (RAPCD): Validating EOS Satellite Ozone Measurements. *EOS Investigators Working Group*.
71. Newchurch, M. J., and Coauthors, 2001j: Critical Assessment of TOMS-derived Tropospheric Ozone: Comparisons with Other Measurements and Model Evaluation of Controlling Processes. *TOMS Science Team Meeting*.
70. Newchurch, M. J., and Coauthors, 2001k: Tropospheric Ozone and the NSSTC Regional Atmospheric Profiling Center for Discovery, RAPCD. *Presented at the National Space Science and Technology Center*.
69. Newchurch, M. J., and Coauthors, 2001l: Tropical Tropospheric Ozone: Global Measurements and Modeling. *Measurement/Model Comparison Seminar at NCAR*.
68. Newchurch, M. J., and Coauthors, 2001m: Regional Atmospheric Profiling Center for Discovery (RAPCD). *National Space Science and Technology Center*.
67. Wang, H., D. Cunnold, J. Zawodny, L. Thomason, E. Yang, and M. Newchurch, 2001: Ozone Validation and Trends Near the Tropopause from SAGE V6. 0 Observations. *AGU Spring Meeting Abstracts*, A52A-12.
66. Ayoub, M., M. J. Newchurch, and D. McNider, 2000a: SOS99 Tropospheric Ozone: Overview of Tropospheric Ozone Over Old Hickory, TN During the Southern Oxidants Study 1999 Field Intensive. *National Space Science and Technology Center*.
65. ——, 2000b: Variations in Upper-atmospheric Ozone as Seen with the Daily Ozonesondes. *SOS Data Analysis Workshop*.
64. Herwehe, J. A., R. T. McNider, and M. J. Newchurch, 2000: A Numerical Study of the Effects of Large Eddies on Photochemistry in the Convective Boundary Layer. *In Preprints of the AMS 14th Symposium on Boundary Layers and Turbulence*.

63. Kim, J. H., M. J. Newchurch, and K. Han, 2000a: Distribution of Tropical Tropospheric Ozone Directly Determined from TOMS Measurements. *Proceeding of Atmospheric Science and Application to Air Quality*, Taipei, Taiwan.
62. ——, 2000b: Distribution of Tropical Tropospheric Ozone Directly Determined from TOMS Scan Angle Geometry. *Quadrennial Ozone Symposium*, Sapporo, Japan.
61. ——, 2000c: Distribution of Tropospheric Ozone Column Determined Directly from TOMS Measurements. *TOMS Meeting*.
60. Liu, X., M. J. Newchurch, and J. H. Kim, 2000a: Lower-Tropospheric Ozone Derived from TOMS V7 Level-2 Data. *TOMS Meeting*.
59. ——, 2000b: Occurrence of TOMS V7 Level-2 Ozone Anomalies over Cloudy Areas. *TOMS Meeting*.
58. Liu, X., M. J. Newchurch, D. Sun, and J. H. Kim, 2000c: TOMS Accuracy over High Convective Cloudy Areas. *TOMS Meeting*.
57. Newchurch, M. J., M. Ayoub, and D. McNider, 2000a: Conjectures on Processes Controlling Measured Ozone Profiles in Nashville 1999. *Weather Research and Forecasting Model Workshop*.
56. Newchurch, M. J., M. Ayoub, B. Johnson, and S. Oltmans, 2000b: Huntsville, Alabama Ozonesonde Station. *TOMS Meeting*.
55. Newchurch, M. J., X. Liu, D. Sun, and J. H. Kim, 2000c: Report to the TOMS Science Team. *TOMS Meeting*.
54. Newchurch, M. J., J. H. Kim, D. Sun, X. Liu, and A. Thompson, 2000d: Tropical Tropospheric Ozone from a Variety of TOMS-derived Techniques and Ozonesondes. *AGU Spring Meeting*.
53. Sun, D., M. J. Newchurch, and J. H. Kim, 2000a: The Stratospheric Ozone Wave in Tropical Area. *TOMS Meeting*.
52. Sun, D., M. J. Newchurch, X. Liu, and J. H. Kim, 2000b: Tropical Tropospheric Ozone Using Clear-Cloudy Pairs (CCP) of TOMS Measurements. *TOMS Meeting*.
51. Newchurch, M. J., 1999a: ATMOS-SAGE NO2 Comparisons. *ATMOS Science Team Meeting*.
50. ——, 1999b: Dobson and Brewer Umkehr Ozone-profile Measurements. *Workshop by USGCRP Ozone/Atmospheric Chemistry Group and OFCM Working Group on Monitoring the Stratosphere Maintaining Continuity in Space-Based Ozone Data in 2000-2003 Time Frame*.
49. ——, 1999c: Ozone Profiles and Trends; NO2 Comparisons. *Report to the SAGE II Science Team*.
48. ——, 1999d: Tropical Tropospheric Ozone Observations. *Invited Talk*.
47. Newchurch, M. J., 1999e: Umkehr Ozone Validation Considerations. *Umkehr Review Meeting*.
46. Newchurch, M. J., and L. Emmons, 1999: ATMOS, MOZART and Data Composites. *ATMOS Science Team Meeting*.
45. Newchurch, M. J., and D. A. Bowdle, 1999: Particulate Retrievals from ATMOS Solar Occultation Spectra. *ATMOS Science Team Meeting*.
44. Newchurch, M. J., X. Liu, D. Sun, and J. Kim, 1999: Report to the TOMS Science Team. *TOMS Science Team Meeting*.
43. Kim, J. H., M. J. Newchurch, R. D. Hudson, and A. Thompson, 1998: On the Derivation of Tropospheric Ozone from TOMS Measurements. *Invited Talk*.

42. Newchurch, M. J., 1998a: The Ozone Deficit. *Invited Talk*.
41. ——, 1998b: Report to the SAGE II Science Team: SAGE and Umkehr Ozone Profiles and Trends. *SAGE II Science Team Meeting*.
40. ——, 1998c: Report to the TOMS Science Team. *TOMS Science Team Meeting*.
39. Newchurch, M. J., and J. H. Kim, 1998: Biomass-burning Influence on Tropical Tropospheric Ozone *AGU Fall Meeting*.
38. Newchurch, M. J., and Coauthors, 1998b: Stratospheric Ozone Trends: Results from the IOC/SPARC Ozone Trends Assessment and the WMO/UNEP 1998 Assessment. *Invited Talk*.
37. ——, 1998c: Stratospheric Ozone Trends: Summary of the IOC/SPARC Ozone Trends Assessment. *Invited Talk*.
36. Newchurch, M. J., and Coauthors, 1998d: Trends in Upper-stratospheric Ozone. *AGU Spring Meeting*.
35. Yang, E. S., and M. J. Newchurch, 1998: A Multivariate Auto-Regressive Combined Harmonics (MARCH) Approach to Time Series Data. *Invited Talk*.
34. Newchurch, M. J., and J. H. Kim, 1997a: Biomass-Burning Influence on TOMS-derived Tropospheric Ozone in the Tropics. *AGU Fall Meeting*.
33. ——, 1997b: Biomass-Burning Influence on Tropospheric Ozone Over New Guinea and South America. *Gordon Research Conference on Atmospheric Chemistry*.
32. ——, 1997d: Derivation of Tropospheric Ozone Climatology and Trends from TOMS Data. *Invited Talk*.
31. Newchurch, M. J., and E. S. Yang, 1997a: Stratospheric Ozone Trends Measured by Dobson/Umkehr, SAGE and SBUV. *POAM Science Team Meeting*.
30. ——, 1997b: Upper-Stratospheric Ozone Trends. *SPARC/IOC Review Meeting on Trends in the Vertical Distribution of Ozone*.
29. Newchurch, M. J., and J. H. Kim, 1997c: Biomass-Burning Influence on Tropospheric Ozone Over New Guinea and South America. *IGAC-SPARC-GAW Conference on Global Measurement Systems for Atmospheric Composition*.
28. Newchurch, M. J., D. Cunnold, C. Mateer, and J. Cao, 1997: Umkehr[64] and Umkehr[92] Ozone Profiles and Time Series Compared to SAGE. *IGAC-SPARC-GAW Conference on Global Measurement Systems for Atmospheric Composition*.
27. Newchurch, M. J., 1996a: 67 years of Dobson Umkehr Observations: An Overview. *SPARC/IOC Meeting on Trends in the Vertical Distribution of Ozone*.
26. ——, 1996b: Umkehr and SAGE Ozone: Retrieval and A Priori Differences at 15 Stations. *NOAA/CMDL Annual Meeting*.
25. Newchurch, M. J., and E. S. Yang, 1996: Some Considerations in Deriving Umkehr Ozone Trends. *SPARC/IOC Meeting on Trends in the Vertical Distribution of Ozone*.
24. Newchurch, M. J., D. Cunnold, and J. Cao, 1996a: Umkehr and SAGE Ozone Profile Comparisons. *SPARC/IOC Meeting on Trends in the Vertical Distribution of Ozone*.
23. Abbas, M. J., and Coauthors, 1995: Hydrogen Budget of the Stratosphere from ATMOS/ATLAS Measurements of Water Vapor and Methane. *AGU Fall Meeting*.
22. Abrams, M. C., M. R. Gunson, and M. J. Newchurch, 1995: ATMOS/ATLAS Observations of Ozone and Temperature in the Middle Atmosphere. *XXI General Assembly of IUGG*.

21. Chang, A. Y., and Coauthors, 1995: Lifetimes of Atmospheric Source Gases Inferred from ATMOS Measurements. *5th Annual Meeting on Atmospheric Effects of Aviation Project*.
20. Gunson, M. R., and Coauthors, 1995: A Comparison of ATMOS and ER-2 Gas Measurements During November 1994. *5th Annual Meeting on Atmospheric Effects of Aviation Project*.
19. Newchurch, M. J., 1995: Comparisons of Old and New Umkehrs to SAGE II Ozone Profiles and Some Preliminary ATMOS Results. *NOAA/CMDL Annual Meeting*.
18. Newchurch, M. J., and D. M. Cunnold, 1995: SAGE II and Umkehr Ozone Measurements in the Lower Stratosphere. *International Conference on Ozone in the Lower Stratosphere*.
17. Newchurch, M. J., D. M. Cunnold, M. Allen, and B. Herman, 1995b: Old and New Umkehr Ozone Profiles Compared to SAGE II: Measurements and Radiative Transfer Calculations. *XXI General Assembly of IUGG*.
16. Newchurch, M. J., D. M. Cunnold, M. Allen, and B. M. Herman, 1995c: SAGE-Umkehr Ozone Profile Analyses. *DOE Atmospheric Chemistry Program Annual Meeting*.
15. Newchurch, M. J., 1994: Report to the SAGE II Science Team. *SAGE II Science Team Meeting*.
14. Newchurch, M. J., D. M. Cunnold, M. Allen, and B. M. Herman, 1994a: SAGE-Umkehr Ozone Analyses. *DOE Atmospheric Chemistry Program*.
13. ——, 1994b: SAGE-Umkehr Ozone Analyses and Related Research. *DOE Atmospheric Chemistry Program*.
12. Newchurch, M. J., 1993: Empirical and Theoretical Study of Umkehr Ozone Profiles and Aerosol Effects Using SAGE II Data. *SAGE II Science Team Meeting*.
11. Newchurch, M. J., M. Allen, and R. Stachnik, 1993: Stratospheric Chlorine Partitioning Modeling with SL-3 ATMOS and Balloon Microwave Limb Sounding Measurements. *AGU Fall Meeting*.
10. Newchurch, M. J., and D. M. Cunnold, 1992: SAGE II-Umkehr Case Study of Ozone Differences and Aerosol Effects from October 1984 to April 1989. *Quadrennial Ozone Symposium*.
9. Newchurch, M. J., G. P. Kubic, V. L. Griffin, and J. Piccirillo, 1991: Visible Earthlimb Radiance Profiles. *Midcourse Phenomenology Symposium*.
8. Griffin, V. L., and M. J. Newchurch, 1990a: A Comparison of AVHRR Radiances with Airborne Radiometer Measurements. *Topical Meeting on Optical Remote Sensing of the Atmosphere*.
7. Griffin, V. L., and M. J. Newchurch, 1990b: A Comparison of AVHRR Radiances with Airborne Radiometer Measurements. *Cloud Impacts on DoD Operations and Systems 1989/90*.
6. Newchurch, M. J., and D. M. Cunnold, 1990: Comparison of SAGE II and Umkehr Ozone Profiles as Functions of Stratospheric Optical Depth, Total Ozone, Season, and Tropopause Height. *Topical Meeting on Optical Remote Sensing of the Atmosphere*.
5. Schmidt, E. O., and M. J. Newchurch, 1990: Analysis of Radiometric Knees Using LOWTRAN. *Cloud Impacts on DoD Operations and Systems 1989/90*.
4. Griffin, V. L., and M. J. Newchurch, 1988: Geophysical Database for Thrusted Vector Program. *Cloud Impacts on DoD Operations and Systems*.

3. Newchurch, M. J., 1988: Geophysical Database for SDI (Classified). *Passive Optical Signatures Symposium*.
2. Newchurch, M. J., V. L. Griffin, and J. S. Gothart, 1988a: Climatology and Characterization of Tropical Cirrus Cloud Radiometric Properties. *Cloud Impacts on DoD Operations and Systems*.
1. Newchurch, M. J., G. W. Grams, D. M. Cunnold, and J. J. DeLuisi, 1988b: A Comparison of SAGE I and Umkehr Ozone Profiles Including a Search for Umkehr Aerosol Effects. *Quadrennial Ozone Symposium*.

PROPOSAL AWARD HISTORY

Proposal Award History

Contract	Account #	Proposal #	PI	Title	POP	Sponsor	Net Award
N/A	N/A	1991-474	Dr. Mike Newchurch, PI	Research Plan for Use of Atlas Data	7/25/1991	NASA MSFC	$50,000
N/A	N/A	1992-417	Dr. Mike Newchurch, PI	Refine Research Plan for Use of Atmospheric Laboratory for Application	5/28/1992	NASA MSFC	$65,000
NAS8-38609	5-33306	1993-405	Dr. Mike Newchurch, PI	Stratospheric Chemistry Research	8/1/1993-7/30/1995	ESSC MSFC	$65,876
NAS8-38609	5-33307	1993-405	Dr. Mike Newchurch, PI	Stratospheric Chemistry Research	8/1/1993-7/30/1995	ESSC MSFC	$19,124
NCC8-22	5-33432	N/A	Dr. Mike Newchurch, PI	ATLAS Atmospheric Chemistry	9/1/1993-9/30/1997	ESSC MSFC	$116,343
DE-FG05-93ER61730	5-33374	1993-285	Dr. Mike Newchurch, PI	SAGE II Umkehr Ozone Comparisons	9/15/1993-9/14/1997	ESSC DOE	$495,739
959894	5-33504	1981-712	Dr. Mike Newchurch, PI	Atmospheric Trace Molecular Spectroscopy	9/15/1993-9/14/1997	ESSC JPL	$183,000
N/A	N/A	1994-455	Dr. Mike Newchurch, PI	ATLAS Stratospheric Chemistry Research	5/19/1994	NASA MSFC	$85,000
N00014-94-1-G034	5-33679	1994-287	Dr. Mike Newchurch, PI	Chemical Modeling of Stratospheric. Chlorine	9/30/1994-9/29/1997	ESSC NAVY/NRL	$50,000
NAGW-4681	5-33946	1995-605	Dr. Mike Newchurch, PI	Validation of the Tropospheric Ozone Residual	9/1/1995-12/31/1995	ESSC NASA HQ	$20,000
NAG1-1842						ESSC	$238,928

	5-34494	1995-540	Dr. Mike Newchurch, PI	Station-to-Station Ozone Variability	7/1/1996-6/30/2000	LARC	
NAG1-1898	5-34681	1996-578	Dr. Mike Newchurch, PI	SAGE II NO2	1/15/1997-2/4/2000	ESSC LARC	$189,507
N/A	N/A	1997-006	Dr. Mike Newchurch, PI	Tropospheric Ozone Trends from TOMS	10/11/1996	NASA HQ ACMAP	$19,000
NAG1-2026	5-20111	1997-501	Dr. Mike Newchurch, PI	Aerosal Retrievals from High Resolution Broadband Radiances	1/1/1998-12/31/2001	ESSC LARC	$142,330
NAG5-7269	5-20186	1998-521	Dr. Mike Newchurch, PI	Derivation of Tropospheric Ozone Climatology & Trends	5/15/1998-5/14/2002	ESSC GSFC	$259,246
N/A	N/A	1998-374	Dr. Christopher, PI Dr. Mike Newchurch, Co-I	Validation and Intercomparison of TOMS Aerosol Products Using Satellite and Ground Based Measurements	1998-2001	NASA ACMAP	$240,000
NAG1-2204	5-20621	1998-375	Dr. Mike Newchurch, PI	Ozone Trends in SAGE, HALOE	7/1/1999-6/30/2002	ESSC LARC	$275,066
40-RA-NR-108712	5-21272	2001-220	Dr. Mike Newchurch, PI	Ozone Profile Measurements	2/12/2001-12/30/2001	ESSC NOAA	$15,278
NAG5-10965	5-21733	2001-316	Dr. Mike Newchurch, PI	Ozone Retrieval Errors Associated with Clouds	6/1/2001-5/31/2002	ESSC GSFC	$60,000
NAG5-11248	5-21762	2001-063	Dr. Mike Newchurch, PI	Optimal Aerosol Parameterization for Remote Sensing	8/15/2001-8/14/2004	ESSC GSFC	$368,087
NCC8-200	745064	N/A	Dr. Mike Newchurch, PI	TOMS Science Team	8/24/2001-8/9/2005	ESSC MSFC	$15,000
NAG5-11096	745087	2001-061	Dr. Mike Newchurch, PI	Critical Assessment of TOMS-derived Tropospheric Ozone	9/1/2001-8/31/2005	ESSC GSFC	$326,258
NAG5-11100	745092	2000-420; 2004-535	Dr. Mike Newchurch, PI	Validating AIRS Ozone Observations	9/1/2001-8/31/2006	ESSC GSFC	$350,918
RA1330-02-SE-0186	5-22070	2002-320	Dr. Mike Newchurch, PI	Ozonesondes at the Huntsville Station 2002	10/1/2001-9/30/2002	ESSC NOAA	$15,278
582-2-48649	5-21976	2002-148	Dr. Mike Newchurch, PI	Analysis of Ozonesonde Data During TexAQS 2000	2/6/2002-8/31/2002	ESSC Texas Nat. Resource & Cons. Co	$22,000
						ESSC	$15,278

RA 1330-03-SE-0202	5-22250	2003-139	Dr. Mike Newchurch, PI	Ozonesondes at the Huntsville Station 2003	10/1/2002-9/30/2003	NOAA	
2002006	675011	N/A	Dr. Mike Newchurch, PI	Cooperative Micro-Satellite Experiment	10/3/2002-3/31/2007	RSESC Radiance Technologies	$665,880
N/A	N/A	N/A	Dr. Mike Newchurch, PI	Science Team Seed Funding for a Regional Atmospheric Profiling Center for Discovery, RAPCD	2001	NASA MSFC	$15,000
NCC8-200	745078	2002-335	Dr. Mike Newchurch, PI	Atmospheric Chemistry	7/9/2003-8/9/2005	ESSC MSFC	$76,110
RA133R-04-SE-0305	5-22656	2004-307	Dr. Mike Newchurch, PI	Ozonesondes at the Huntsville Station 2004	10/1/2003-9/30/2004	ESSC NOAA	$15,278
2002006	745133	2004-037	Dr. Mike Newchurch, PI	Cooperative Micro-Satellite Experiment	2/1/2004-3/31/2007	ESSC Radiance Technologies	$177,173
NNG04GM44G	745143	2005-323	Dr. Mike Newchurch, PI	Atmospheric Chemistry Studies Combining Satellite Observations	6/15/2004-6/14/2007	ESSC NASA HQ	$92,907
RA 133R-05-SE-2640	745163	N/A	Dr. Mike Newchurch, PI	/Ozonesondes at the Huntsville Station 2005	10/1/2004-9/30/2005	ESSC NASA HQ	$15,278
TCN 05172	745174	2005-341	Dr. Mike Newchurch, Co-I	A Planning Initiative to Define Observational and Theoretical Mesoscale Phenomena	7/11/2005-11/30/2007	ESSC BATTELLE	$58,083
NNM05AA22A	745009	2005-402	Dr. Mike Newchurch, PI	Tropospheric Ozone Lidar and Ozonesondes at Huntsville	8/10/2005-8/9/2009	ESSC NASA HQ	$629,789
RA133R-06-SE-0773	745085	2006-189	Dr. Mike Newchurch, PI	Ozonesondes at the Huntsville Station 2006	10/1/2005-9/30/2006	ESSC NOAA	$4,000
NNG06GH86G	745099	2005-356R	Dr. Mike Newchurch, PI	Implementation and Assessment of Ozone Profiling	5/1/2006-4/30/2009	ESSC NASA HQ	$224,999
NA06NES4400008	745238	2006-238	Dr. Mike Newchurch, Co-PI	Spaced Remote Sensing of Air Quality	6/1/2006-5/31/2009	ESSC NOAA	$1,800,000
NNX06AC57G	745229	2004-578R	Dr. Mike Newchurch, PI	Validation of OMI-Derived Tropospheric Ozone	7/1/2006-6/30/2009	ESSC NASA HQ	$289,866
NA07NES4280005	745286	2007-387	Dr. Mike Newchurch, Co-PI	Remote Sensing and Modeling of Air Quality	8/1/2007-7/31/2009	ESSC NOAA	$500,000
						ESSC	$183,915

NNM05AA22A	745275	2007-311	Dr. Mike Newchurch, PI	Experiment to Improve Air Quality Forecast	8/10/2007-8/9/2009	MSFC	
NA08NES4400018	745336	2008-401	Dr. Mike Newchurch, Co-PI	UAHuntsville Proposal to support NOAA's Air Quality	8/1/2008-7/31/2010	ESSC NOAA	$325,172
			Dr. Mike Newchurch Co-PI	Lidar Ceilometer Upgrade to UAH Mobile Profiling System	3/9/2011 - 10/1/2012	UAH ATS	$36,254
			Dr. Mike Newchurch Co-PI	MRI: Acquisition of a Portable Doppler Wind and Aerosol Lidar for Research Enhancements in the Boundary Layer Meteorology, Atmospheric Chemistry, Aerosol Science and Cloud Physics.	8/1/2011 - 8/1/2012	NSF	$257,027
NA09NES4400017	745367	2009 - 375R	Dr. Mike Newchurch , PI	Satellite-Based Assessment of Regional Air Quality and Climate	8/1/2009 - 7/31/2012	ESSC NOAA	$290,000
NNM11AA01A	745471	2011-514	Dr. Mike Newchurch , PI	Tropospheric Ozone Lidar Measurements Initiative: UAH Activities	8/1/2011 - 7/31/2012	ESSC NASA HQ	$412,628
	745437		Dr. Mike Newchurch , PI	Tropospheric Ozone Lidar and Ozonesondes at RAPCD for EOS AURA Validation (2.9.1)	4/1/2011 to 3/31/2016	NASA	$859,000
			Dr. Mike Newchurch , PI	Tropospheric Ozone Lidar Measurements Initiative.: UAH Activities (2.9.2)	8/1/2011 to 7/31/2016	NASA	$410,000
			Dr. Mike Newchurch , PI	FY2014 Huntsville Ozone DIAL Scanner Hardware Upgrade	5/15/2014 to 9/15/2014	NASA	$110,000
			Dr. Mike Newchurch , PI	Tropospheric Ozone Lidar Network (TOLNet)	10/1/2014 to 9/30/2017	NASA	$1,540,000
			Dr. Mike Newchurch , PI	Tropospheric Ozone Lidar Network (TOLNet)	10/1/2017 to 9/30/2019	NASA	$325,000
			Dr. Mike Newchurch , PI	Tropospheric Ozone Lidar Network (TOLNet)	10/1/2010 ton 9/30/2024	NASA	$2,250,000

			Dr. Mike Newchurch , PI	TOLNet Lidar Measurements	2018-2023	NASA	$500,000
			Dr. Mike Newchurch , PI	TOLNet Lidar Instruments	2018-2023	NASA	$100,000
			Dr. Mike Newchurch , PI	TOLNet Lidar Instruments	2021-2026	NASA	$2,200,000
			Dr. Mike Newchurch ,KP	TEMPO Deputy Program Applications (DPA) Lead: Pre-launch Activities to Advance TEMPO MissionGoals	2020-2023	NASA	$516,000
			Dr. Mike Newchurch , PI	Joint Science Meeting for TEMPO, GeoXO ACX, & TOLNet	2023-2024	NOAA	$30,000
	745 A7N		Dr. Mike Newchurch , PI	F/NASA/UAH TOLNet Lidar Measurement for TEMPO Validation and Scientific Research	05/01/2024-05/06/2025	NASA	$325,000
				Total Awarded Amount:			$18.9M

STUDENTS SUPERVISED

Undergraduate Research Students

Year	Student's Name
1992-1995	Dawn Wallace Stripling
1993-1996	Colette Mitchell
1993-1995	Stephanie Willingham
1993-1995	Gabriel Collins
1993-1994	Ananta Gudipaty
1993-1994	Jennifer Bridges
1993	Garvin Dean
1994-1995	Laura Branch
1995-1996	Kimberly Cox
1995-1996	Lalitha Gud ipaty
1996-2001	Leanne McAllister
1998-1999	Yook Mei Chong
2000-2001	Andayani Liauw
2001	Lawanna McClease
2002	Hayley Cluck
2002-2003	Jennifer Williams
2002-2003	Lyndie Cyphers
2003-2004	Sharon Robers
2003-2005	Michael Robison

2004-2007	Holly Searcy
2006-2008	Danielle Nuding
2007-2009	Stephanie Long
2007-2009	Stephanie Horne
2007	Casey Swilley
2008-2009	Ragavendra Yarasi
2009	Sharon Conrad
2009-2013	Wes Cantrell
2013-2014	Nancy Pospelov
2014-2015	Clayton Craft
2015-2016	Nathan Lawrence
2015-2016	Michael Graham
2016-2017	Chris Tran
2016-2019	David Mercier
2016-2019	Ankur Shah
2019-2022	Todd McKinney

Graduate Students

Student	Degree & Major Field of Study	Title of Paper, Thesis, or Dissertation	Expected/Actual Date of Graduation
Karl Huston	ATS MS	Variations of stratospheric NO_x across the terminator	Returned to private sector
Eun Su Yang	ATS, PhD	Ozone trends from Arosa Dobson Umkehrs	Fall 00 Graduated
Mohammed Ayoub	ATS, MS	Ozonesonde measurements and analysis	2002 MS
Xiong Liu	ATS, PhD	TOMS Tropospheric Ozone Retrieval	Fall 2002 Graduated
Da Sun	ATS, PhD	TOMS Tropospheric Ozone Retrieval	2003 PhD
Jing Song	ATS	Tropospheric Ozone	2003 Transferred
Alishia Holley	ATS, MS	Aerosol measurements	2005 PhD
Judy Hopey	ATS, MS	MOUDI Aerosol Measurements	2006 MS
Pavan Ilipilla	ATS, MS	N/A	2007 Transferred
Shi Kuang	ATS, PhD	Ozone Lidar Retrieval	2009 PhD
Lihua Wang	ATS, PhD	Chem Satellite obs.	2009 PhD
Rochelle Williams	ATS, PhD	Atm Plume modeling	2009, left the program
Patrick Buckley	ATS, MS	Application of Cryogenic FTIR Spectroscopy for Monitoring Air Quality	2011 PhD
Guanyu Huang	ATS, PhD	LES modeling of tropospheric ozone lidar observations	2014 Graduated

Wes Cantrell	ATS, MS	N/A	Returned to private sector
Kristen Pozsonyi	ATS, MS	Detecting the Ozone Production Potential of Prescribed Fires	2019 MS
Bo Wang	ATS, PhD	Vertical Accumulation of Ozone and Aerosol during the 2016 Southeastern U.S. Wildfires	2020 PhD
Paula Tucker	ATS, MS		2021 MS
Todd McKinney	ATS, MS		2023 MS

Committees

Student's Name	Degree & Major Field of Study	Title of Plan II Paper, Thesis or Dissertation	Term of Assignment	Role
J. Herwehe	ATS, PhD	Large Eddy Simulations	1998-2000	Comm. Member
Yuling Wu	ATS, PhD	Air Pollution Modeling	1998-2003	Comm. Member
Jinlong Li	ATS/GT, PhD	Atmospheric Chemistry	1997-2002	Comm. Member
Kurt Lightner	ATS/UMBC, PhD	FTIR Ozone Profiles	2001-2004	Comm. Member
Casey Calimaio	ESS, MS		2014-2017	Comm. Member
Aaron Kaulfus	ATS, PhD		2017-Present	Comm. Member
Megan McPeak	ATS, MS		2018-Present	Comm. Member

Postdoctoral Associates

Student's Name	Degree, Institution, Date	Field of Study	Term of Assignment
Jing Cao	Ph.D. Georgia Tech, 1994	Satellite remote sensing of stratospheric ozone	1994-1995
Jae Hwan Kim	Ph.D. U. Maryland, 1995	Satellite remote sensing of atmospheric ozone	1995-1996 NRC appointment
Shi Kuang	Ph.D. UAH, 2009	Lidar observations of atmospheric ozone and aerosols	2009-2011
Lihua Wang	Ph.D. UAH, 2009	Mesoscale modeling of atmospheric chemistry and lightning effects	2009-2011

HONORS AND AWARDS

- NASA Exceptional Public Service Medal 2024
- NASA Group Achievement Award for TEMPO 2024
- NASA Group Achievement Award for TOLNet, 2019
- NASA Group Achievement Award for ARCTAS, 2009
- Oceanic and Atmospheric Research Outstanding Scientific Paper Award, 2007
- William T. Pecora Award, 2007
- NASA Group Achievement Award for the TOMS team, 2006
- NASA Group Achievement Award for the Intercontinental Chemical Transport Experiment North America Science Team, 2005
- Sigma Xi Researcher of the Year 2004, UAH Chapter
- Sigma Xi (Scientific research honor society) member
- Top-10 NASA Accomplishments for 2003; most popular AAAS and AGU web science story (2003): National Press Club announcement followed by >100 world-wide news stories: First Stage of Upper Atmospheric Ozone Recovery (2003).
- NASA Group Achievement Award (ATLAS-2 and ATLAS-3)
- NASA Group Achievement Award for ATLAS-2 mission, 1993
- NASA Group Achievement Award for ATLAS-3 mission, 1994

STUDENT AWARDS

- Danielle Nuding- awarded the Goldwater Scholarship, 2008
- Danielle Nuding- JPL Award- NASA Space Grant Summer Internship, 2007
- Stephanie Long became the first von Braun Scholarship recipient in UAH's College of Science

SERVICE

Major Departmental Service

- ATS620 Ph.D. qualifying exam questions
- ATS551 Ph.D. qualifying exam questions
- ATS520 Ph.D. qualifying exam questions
- Chief Architect- Strategic Planning Committee, 2000-2002
- ATS551 Ph.D. qualifying exam questions
- ATS520, ATS620, ATS 622 qualifying exam questions

University Service

- Serve on reappointment committee for Dr. Ying Zou, 2020
- Regional Science Fair Judge, 2002-present
- State Science Fair Environ. Science Judge, 2002-present
- University Review Board, 2014-2016
- PTAC Member, 2003-2005, 2011-2012, 2013-2014
- Promotion Committee for Dr. Shuang Nan Zhang, 2006

- Alternate member of the College of Science Promotion and Tenure Committee, 2006
- Graduate Curriculum Committee Member, 2003-2005
- Undergrad. Science Scholarship Committee, 2004
- Publications Committee Member, 2000-2003
- University Building Committee Member, 2000-2003
- Chan Chair Search Committee Member, 2001

Professional Service

- GEO-XO/ACX science team member 2023-present
- TEMPO science team member, 2013-present
- TOLNet founder, PI, Chief Scientist, 2011-present
- GEO-CAPE science team member, 2009-present
- OMI science team member, 2006-present
- AIRS science team member, 2000-present
- NOAA-CREST Scientific Advisory Committee, 2003-present
- LaRC External Scientific Review Board, 2008
- SAGE science team member, 1994-2007
- TOMS science team member, 1997-2007
- IOC/SPARC Ozone Trends Assessment Panel member, 1998-1999, 2006
- POAM science team member, 1996-2006
- NASA Space Station Scientific Advisory Committee member, 1999-2003
- Investigator, ATMOS science team, 1992-2000
- USA Scientific Review of Republic of Korea Space Science Program member, 1998

Public Service Activities

- Baseball Coach, 1998-2001, 2005-2015
- Boy Scout Leader 2002-2018
- Alabama Science Fair Judge 2002-present
- Lecturer on Frontiers in Science careers and research, 2005-2012
- St. John’s Catholic School Board Member 2006-2008
- Cub Scout Leader 2001-2008
- Soccer Coach, 1999-2006
- Scientific mentor, NCAR SOARS program, 1998