

Curriculum Vitae

Prof. David John Lary

University of Texas at Dallas, 800 W Campbell Rd, Richardson, TX 75080

Telephone 972-489-2059. Email: David.Lary@utdallas.edu Web: <http://utdallas.edu/~david.lary/>

OVERVIEW

My work is in the area of Applied Physics for Societal Benefit with a focus on using remote sensing from robotic aerial vehicles and satellites coupled with machine learning to facilitate scientific discovery and decision support. All of the elements described in this CV have used or supported this goal. From my PhD at the University of Cambridge which described the world's first chemical scheme within a weather forecasting model, to the autonomous earth observing system I have developed for NASA, to the use of artificial intelligence to deal with inter-instrument biases and produce climate data records, to the support of various decision support tools in areas such as smart agriculture, tornado prediction, disaster response, famine relief, health systems, to the detection of online fraud. All have used and furthered computational discovery. These contributions have been recognized by my peers through: Invited contributions to the Royal Society, National Academies, and CDC, two dedicated EGU symposia sessions, three prestigious fellowships, five editorial commendations, several million dollars in research funding, seven NASA awards, and more than sixty publications with over a thousand citations in the peer-reviewed literature with a Hirsch Index of seventeen.



EDUCATION

PhD In Photochemical Modeling of the Atmosphere 1987-1991

Department of Chemistry and Churchill College, University of Cambridge, England.



First Class Double Honors BSc. In Physics & Chemistry, King's College, London, England. 1984-1987
with the Sambrooke Exhibition Prize for Natural Science

EMPLOYMENT WITH THE UNIVERSITY OF TEXAS AT DALLAS

Associate Professor and Founding Director of the Center for Multi-scale Intelligent Integrated Interactive Sensing
Center for Space Science, Department of Physics 2010-present



EMPLOYMENT WITH NASA AND THE UNIVERSITY OF MARYLAND FOR TEN YEARS

Full Professor/Senior Research Scientist

Software Integration and Visualization Office, NASA Goddard Space Flight Centre and the Joint Center for Earth Systems Technology (JCET)/UMBC 2008-2010



Atmospheric Chemistry and Dynamics Branch, NASA Goddard Space Flight Centre and the Goddard Earth Sciences and Technology Center (GEST) /UMBC 2006-2008

Global Modeling and Assimilation Office, NASA Goddard Space Flight Centre and the Goddard Earth Sciences and Technology Center (GEST) /UMBC 2002-2006



The First Distinguished Goddard Fellow in Earth Science 2001-2002

NASA Goddard Space Flight Centre and the Goddard Earth Sciences and Technology Center (GEST) /UMBC
In the last eight years at UMBC/GEST/JCET I have received five NASA awards and was appointed to both the NASA GSFC Science Directors Council and the NASA GSFC Deputy Director's Council on Science.



EMPLOYMENT WITH THE UNIVERSITY OF CAMBRIDGE FOR SIXTEEN YEARS

University of Cambridge, University Lecturer in Chemical Informatics 2000-2001

Personally suggested for this post by the chief scientific adviser to the British Prime Minister and Head of the British Office of Science and Technology, Professor Sir David King. Obtained the equivalent of \$1.5 million dollars of funding from a variety of agencies.



Royal Society University Research Fellow **1996-2002**

University of Cambridge, Department of Chemistry

Established the Cambridge Chemical Data Assimilation Group. Initiators of the technique of Chemical Data Assimilation, commended by the Royal Meteorological Society as pioneering, supported financially by the Royal Society, the European Union, the European Space Agency and the UK Natural Environment Research Council.

Senior Lecturer and Alon Fellow **1998-2000**

University of Tel-Aviv, Department of Geophysics and Planetary Space Science

An Alon Fellow is the highest award Israel can give a young scientist. While there, I gave courses including one in atmospheric chemistry and climate. This was a joint appointment with Cambridge.

Post Doctoral Research Associate **1994-1996**

University of Cambridge

Post Doctoral Research Assistant **1991-1994**

University of Cambridge

AWARDS AND HONORS

IEEE Geoscience and Remote Sensing Society Letters Prize Paper Award	2010
Appointed to the NASA GSFC Deputy Director's Council on Science	2009
NASA Group Achievement Honor Award	2008
Appointed to the NASA GSFC Deputy Director's Council on Science	2008
Appointed to the NASA GSFC Science Director's Council	2007
NASA Space act award	2005
NASA Inventions and Contributions Board Award	2005
NASA Space act award	2004
NASA Tech Brief Award for Creative development of a technical innovation	2004
NASA Data Assimilation Office Special recognition Award	2002
Alon Fellowship	1998-2001
Royal Society Fellowship	1996-2002
Sambrooke Exhibition Prize for Natural Science	1986

TEACHING EXPERIENCE

UTD, Independent Study PHYS (4 Graduate students)	2012
UTD, Independent Study CS (1 Graduate student)	2012
UTD, Classical Mechanics PHYS 2325	2012
UTD, Special Topics in Physics PHYS 5V49-008	2012
UTD, Scientific Computing PHYS 5315	2012
UTD, Independent Study PHYS (3 Graduate students)	2011
UTD, Independent Study CS (1 Graduate student)	2011
UTD, Classical Mechanics PHYS 2325	2011
UTD, Independent Study PHYS (1 Graduate students)	2010
UTD, Independent Study CS (1 Graduate student)	2010
Student Research Projects	2009
UMBC, PHYS440/660 <u>Computational Physics</u>	2009
Student Research Projects	2008
UMBC, Masters Student, Andy Rickert, "Using machine Learning and Atmospheric aerosol Calculations"	2007-2009
Student Research Projects	2007
UMBC, PHYS440/660 <u>Computational Physics</u>	2007
UMBC, PhD Student, Oleg Aulov, " <u>Objectively Optimized Earth Observation</u> "	2006-present
Student Research Projects	2006
Student Research Projects	2005
Student Research Projects	2004
Student Research Projects	2003
Student Research Projects	2002
University of Tel-Aviv, Department of Geophysics, <u>Atmospheric Chemistry & Climate</u>	2000
Student Research Projects	2000
University of Tel-Aviv, Department of Geophysics, <u>Scientific Writing</u>	2000
University of Cambridge, Department of Physical Chemistry, Summer Student Projects	1996-1998
University of Cambridge, Department of Physical Chemistry, <u>Physical Chemistry</u>	1990

In addition to the classes, I also regularly go to local elementary schools, and provide semester long, or summer long, internships for graduates and under graduate students. So far I have provided fifteen such projects, in England I did three, and in the USA I have done twelve. These are essentially active research projects, these have led to student publications. The student publications include (students names in bold),

- **Loughner, C.P.**, et al., A Method to Determine the Spatial Resolution Required to Observe Air Quality from Space. IEEE Transactions on Geoscience and Remote Sensing, 45(5): p. 1308-1314, 2007. Part 2.
- Lary, D.J. and **O. Aulov**, Space-Based Measurements of HCl: Intercomparison and Historical Context. Journal of Geophysical Research-Atmospheres, 113(D15), 2008.
- Lary, D.J., Remer, L., Paradise, S., **MacNeill, D., Roscoe, B.**, Aerosols, Neural networks, Machine Learning, Support Vector Machines, Geoscience and Remote Sensing Letters, in press.

This represents a great experience for the students in research and preparing publications and presentations. The students have given permission to be contacted regarding their experience:

- Devon MacNeil, devon.macneill@gmail.com
- Bryan Roscoe, bryanroscoe@gmail.com
- Chris Loughner, cloughner@gmail.com
- Andrew Rickert, atricket@gmail.com
- Oleg Aulov, user_eng@yahoo.com

RESEARCH SUPPORT

Current grants

- Modeling Studies With Aura MLS Measurements Addressing Partitioning, Consistency, and Long-Term Issues for Atmospheric Constituents, NASA Grant # NNX10AI59G, 2010-2013, **\$42,407**.
- Characterizing Pelagic Habitats within U.S. Gulf of Mexico Coastal Waters Using Satellite Derived Data and Machine Learning Algorithms, NASA Grant # NNX10AD37G, 2010-2012, **\$60,589**.
- The impacts of climate change variability on primary productivity and carbon distributions in the mid Atlantic bight and gulf of Maine, NASA Grant # NNX10AF01G, 2010-2013, **\$59,526**.
- AeroStat: Online Platform for the Statistical Inter-comparison of Aerosols, NASA Grant # NNX10AM94G, 2010-2012, **\$93,380**.
- A Global Context for Health Issues Using Remote Sensing Data, Institute for Integrative Health, 2010-2012, **\$149,600**.
- Development of Novel MODIS Global Ocean Data Products: Colored Dissolved Organic Matter (CDOM) and Dissolved Organic Carbon Algorithms, NASA, 2011-2013, **\$115,000**.
- Linking NASA Data with Environmental Exposures and Health Outcomes in Theater of War, DoD, 2012-2013, **\$199,549**.
- A New Approach to Compute PM2.5 for Health Impact Analysis, NIH, 2012-2013, **\$69,856**.

SERVICE

UTD, Leading activity to refresh the Master of Science degree in Applied Physics	2012
UTD, Outside Chair appointed by Graduate Studies for doctoral final oral exam	2012
Member of selection board for editor of the 8th edition of the "UV/Vis+ Spectra Data Base"	2011
Regular consultant for the National Intrepid Center of Excellence (NICoE) at the National Naval Medical Center in Bethesda, Maryland	2011
UTD, Department of Physics Web Master	2012
UTD, Founding Director of the Center for Multi-Scale Integrated Intelligent Interactive Sensing (MINTS)	2011
UTD, Outside Chair appointed by Graduate Studies for doctoral final oral exam	2010
NASA/GSFC Deputy Director's Council on Science	2009
Chair of GEST Senior Scientist Promotion Committee	2008
NASA/GSFC Deputy Director's Council on Science	2008
NASA/GSFC Science Directors Council	two year term started 2007
NASA/GSFC Civility Working Group	2007-present
http://science.gsfc.nasa.gov/internal/ddcs/membership.html	
NASA Grant Panel Review "Aura/Atmospheric Chemistry" 2007	
NSF Grant Panel Review "Sensor Networks"	2007
NASA Grant Panel Review "Atmospheric Chemical Composition and Modeling"	2006
Elementary School Visit about "Earth Observation"	2006
GEST Senior Scientist Promotion Committee	2005
Numerous paper reviews for Journal of Geophysical Research, Geophysical Research Letters,	1993-present
Journal of Atmospheric Chemistry, Atmospheric Physics and Chemistry Discussions/Transactions	
PhD External Examiner	1999

PROFESSIONAL SOCIETIES

American Association for the Advancement of Science (AAAS)
 American Geophysical Union
 American Institute of Physics
 American Chemical Society

PUBLICATIONS: PEER REVIEWED WORKS

There are over 60 works with a total of 1,070 citations and 4 editorial commendations, and a Hirsch index of 16. This includes an invited Royal Society vision article which was also a requested contribution for two National Academies reports. Several papers are in preparation. 26 papers with 10 or more citations, with the highest receiving 123 citations, and an average of 20.19 citations per paper, and 59.44 citations per year.

1. Lary, D., G. Carver, and J.A. Pyle. A 3-Dimensional Model Study of Chemistry in the Lower Stratosphere, at Middle and Upper Atmosphere Results, 1990, The Hague, Netherlands.
2. Lary, D.J. and J.A. Pyle, Diffuse-Radiation, Twilight, and Photochemistry .1. Journal of Atmospheric Chemistry, 13(4): p. 373-392, 1991. (68 citations)
3. Lary, D.J. and J.A. Pyle, Diffuse-Radiation, Twilight, and Photochemistry .2. Journal of Atmospheric Chemistry, 13(4): p. 393-406, 1991. (14 citations)
4. Lary, D.J., et al., The Bliss Measurements of NO₂ - Some New Insights. Geophysical Research Letters, 18(12): p. 2261-2263, 1991. (5 citations)
5. Pyle, J.A., et al., Ozone Loss in Antarctica - the Implications for Global Change. Philosophical Transactions of the Royal Society of London Series B-Biological Sciences, 338(1285): p. 219-226, 1992. (4 citations)
6. Chipperfield, M.P., et al., A 3-Dimensional Modeling Study of Trace Species in the Arctic Lower Stratosphere During Winter 1989-1990. Journal of Geophysical Research-Atmospheres, 98(D4): p. 7199-7218, 1993. (78 citations)
7. Lary, D., G. Carver, and J.A. Pyle, A 3-Dimensional Model Study of Chemistry in the Lower Stratosphere. Advances in Space Research, 13(1): p. 331-337, 1993. (3 citations)
8. Lary, D.J. and M. Balluch, Solar Heating Rates - the Importance of Spherical Geometry. Journal of the Atmospheric Sciences, 50(24): p. 3983-3993, 1993. (11 citations)
9. Kettleborough, J.A., et al., 3-Dimensional Modeling of Chlorine Activation in the Arctic Stratosphere. Geophysical Research Letters, 21(13): p. 1471-1474, 1994. (2 citations)
10. Lary, D.J., M. Balluch, and S. Bekki, Solar Heating Rates after a Volcanic-Eruption - the Importance of SO₂ Absorption. Quarterly Journal of the Royal Meteorological Society, 120(520): p. 1683-1688, 1994. (3 citations)
11. Lary, D.J., J.A. Pyle, and G. Carver, A 3-Dimensional Model Study of Nitrogen-Oxides in the Stratosphere. Quarterly Journal of the Royal Meteorological Society, 120(516): p. 453-482, 1994. Part B. (10 citations)
12. Lutman, E.R., et al., Trajectory Model Studies of ClO_x Activation During the 1991/92 Northern Hemispheric Winter. Geophysical Research Letters, 21(13): p. 1419-1422, 1994. (13 citations)
13. Lutman, E.R., et al., Box Model Studies of ClO_x Deactivation and Ozone Loss During the 1991/92 Northern-Hemisphere Winter. Geophysical Research Letters, 21(13): p. 1415-1418, 1994. (10 citations)
14. Muller, R., et al., Chlorine Chemistry and the Potential for Ozone Depletion in the Arctic Stratosphere in the Winter of 1991/92. Geophysical Research Letters, 21(13): p. 1427-1430, 1994. (54 citations)
15. Balluch, M. and D.J. Lary, Solar Heating Rates - the Importance of Spherical Geometry - Comment - Reply. Journal of the Atmospheric Sciences, 52(3): p. 383-386, 1995.
16. Fisher, M. and D.J. Lary, Lagrangian 4-Dimensional Variational Data Assimilation of Chemical-Species. Quarterly Journal of the Royal Meteorological Society, 121(527): p. 1681-1704, 1995. Part A. First application of chemical data assimilation. **Described by the Editor as pioneering.** (91 citations)
17. Ghosh, S., D. Lary, and J.A. Pyle, Estimation of Heterogeneous Reaction-Rates for Stratospheric Trace Gases with Particular Reference to the Diffusional Uptake of HCl and ClONO₂ by Polar Stratospheric Clouds. Annales Geophysicae-Atmospheres Hydrospheres and Space Sciences, 13(4): p. 406-412, 1995. (3 citations)
18. Lary, D.J., et al., 3-Dimensional Tracer Initialization and General Diagnostics Using Equivalent Pv Latitude-Potential-Temperature Coordinates. Quarterly Journal of the Royal Meteorological Society, 121(521): p. 187-210, 1995. Part A. (73 citations)
19. Lary, D.J., M.P. Chipperfield, and R. Toumi, The Potential Impact of the Reaction OH+ClO->HCl+O₂ on Polar Ozone Photochemistry. Journal of Atmospheric Chemistry, 21(1): p. 61-79, 1995. (29 citations)
20. Kondo, Y., et al., Interpretation of Nitric Oxide Profile Observed in January 1942 over Kiruna. Journal of Geophysical Research-Atmospheres, 101(D7): p. 12555-12566, 1996. (4 citations)
21. Lary, D.J., Gas Phase Atmospheric Bromine Photochemistry. Journal of Geophysical Research-Atmospheres, 101(D1): p. 1505-1516, 1996. (73 citations)
22. Lary, D.J., et al., Heterogeneous Atmospheric Bromine Chemistry. Journal of Geophysical Research-Atmospheres, 101(D1): p. 1489-1504, 1996. **Specially commended by the Editor.** (93 citations)
23. Rattigan, O.V., et al., UV-Visible Absorption Cross Sections of Gaseous Br₂O and HOBr. Journal of Geophysical Research-Atmospheres, 101(D17): p. 23021-23033, 1996. (32 citations)

24. Balluch, M. and D.J. Lary, Refraction and Atmospheric Photochemistry. *Journal of Geophysical Research-Atmospheres*, 102(D7): p. 8845-8854, 1997. (5 citations)
25. Burton, M., et al., The Prevalence of Cataract in Two Villages of Northern Pakistan with Different Levels of Ultraviolet Radiation. *Eye*, 11: p. 95-101, 1997. Part 1. (9 citations)
26. Chipperfield, M.P., D.E. Shallcross, and D.J. Lary, A Model Study of the Potential Role of the Reaction $\text{BrO} + \text{OH}$ in the Production of Stratospheric HBr. *Geophysical Research Letters*, 24(23): p. 3025-3028, 1997. (16 citations)
27. Lary, D.J., Catalytic Destruction of Stratospheric Ozone. *Journal of Geophysical Research-Atmospheres*, 102(D17): p. 21515-21526, 1997. (28 citations)
28. Lary, D.J., et al., Carbon Aerosols and Atmospheric Photochemistry. *Journal of Geophysical Research-Atmospheres*, 102(D3): p. 3671-3682, 1997. ***Specially commended by the Editor.*** (123 citations)
29. Lary, D.J. and R. Toumi, Halogen-Catalyzed Methane Oxidation. *Journal of Geophysical Research-Atmospheres*, 102(D19): p. 23421-23428, 1997. (11 citations)
30. Lutman, E.R., et al. Three-Dimensional Studies of the 1991/1992 Northern Hemisphere Winter Using Domain-Filling Trajectories with Chemistry, at *Journal of Geophysical Research-Atmospheres*, 1997, Halkidiki, Greece.
31. Allen, D.R., et al., Observations of Middle Atmosphere CO from the UARS ISAMS During the Early Northern Winter 1991/92. *Journal of the Atmospheric Sciences*, 56(4): p. 563-583, 1999. (21 citations)
32. Lary, D.J., Data Assimilation: A Powerful Tool for Atmospheric Chemistry. *Philosophical Transactions of the Royal Society of London Series a-Mathematical Physical and Engineering Sciences*, 357(1763): p. 3445-3457, 1999. ***Invited contribution.*** (5 citations)
33. Lary, D.J., D.E. Shallcross, and R. Toumi, Carbonaceous Aerosols and Their Potential Role in Atmospheric Chemistry. *Journal of Geophysical Research-Atmospheres*, 104(D13): p. 15929-15940, 1999. (41 citations)
34. Lary, D.J. and D.E. Shallcross, Central Role of Carbonyl Compounds in Atmospheric Chemistry. *Journal of Geophysical Research-Atmospheres*, 105(D15): p. 19771-19778, 2000. (15 citations)
35. Lary, D.J. and D.E. Shallcross, Potential Importance of the Reaction $\text{CO} + \text{HNO}_3$. *Journal of Geophysical Research-Atmospheres*, 105(D9): p. 11617-11623, 2000. (1 citations)
36. Wang, K.Y., D.J. Lary, and S.M. Hall, Improvement of a 3D CTM and a 4D Variational Data Assimilation on a Vector Machine Cray J90 through a Multitasking Strategy. *Computer Physics Communications*, 125(1-3): p. 142-153, 2000. (1 citations)
37. Wang, K.Y., et al., A Review on the Use of the Adjoint Method in Four-Dimensional Atmospheric-Chemistry Data Assimilation. *Quarterly Journal of the Royal Meteorological Society*, 127(576): p. 2181-2204, 2001. Part B. (17 citations)
38. Chipperfield, M.P., B.V. Khattatov, and D.J. Lary, Sequential Assimilation of Stratospheric Chemical Observations in a Three-Dimensional Model. *Journal of Geophysical Research-Atmospheres*, 107(D21), 2002. (13 citations)
39. Lary, D.J., B. Khattatov, and H.Y. Mussa, Chemical Data Assimilation: A Case Study of Solar Occultation Data from the Atlas 1 Mission of the Atmospheric Trace Molecule Spectroscopy Experiment (ATMOS). *Journal of Geophysical Research-Atmospheres*, 108(D15), 2003. (2 citations)
40. Lary, D.J., M.D. Muller, and H.Y. Mussa, Using Neural Networks to Describe Tracer Correlations. *Atmospheric Chemistry and Physics*, 4: p. 143-146, 2004. (2 citations)
41. Lahoz, W.A., et al., An Observing System Simulation Experiment to Evaluate the Scientific Merit of Wind and Ozone Measurements from the Future Swift Instrument. *Quarterly Journal of the Royal Meteorological Society*, 131(606): p. 503-523, 2005. Part B. (5 citations)
42. Lary, D.J., Halogens and the Chemistry of the Free Troposphere. *Atmospheric Chemistry and Physics*, 5: p. 227-237, 2005. (7 citations)
43. Noelle, A., et al., UV/Vis Spectra Data Base, A. Noelle, G.K. Hartmann, D.J. Lary, W.-U. Palm, A.-C. Vandaele, R.P. Wayne, and C.Y.R. Wu, Editors. 2005, science-softCon, <http://www.science-softcon.de/uv-vis.htm>
44. Lary, D.J. and L. Lait, Using Probability Distribution Functions for Satellite Validation. *IEEE Transactions on Geoscience and Remote Sensing*, 44(5): p. 1359-1366, 2006. (7 citations)
45. Mussa, H.Y., D.J. Lary, and R.C. Glen. Building Structure-Property Predictive Models Using Data Assimilation, at *Computational Life Sciences II, Proceedings*, 2006, Cambridge, ENGLAND.
46. Lary, D.J. Autonomous Objectively Optimized Observing Systems, at *IGARSS: 2007 IEEE International Geoscience and Remote Sensing Symposium, Vols 1-12 - Sensing and Understanding Our Planet*, 2007, Barcelona, SPAIN.
47. Lary, D.J. An Objectively Optimized Earth Observing System, at *2007 IEEE Aerospace Conference, Vols 1-9*, 2007, Big Sky, MT.
48. Lary, D.J. and A. Koratkar, Data Assimilation and Objectively Optimized Earth Observation, in *Advances in Science: Earth Science*. 2007, Imperial College Press. p. 293-310, Invited vision article, specially commended by the editor. ***An invited contribution to the National Academies Press CD ROM containing the two National Research Council reports Earth Science and Applications from Space: Urgent Needs and Opportunities to Serve the Nation and National Imperatives for the Next Decade and Beyond.***
49. Lary, D.J., et al., Variations in Stratospheric Inorganic Chlorine between 1991 and 2006. *Geophysical Research Letters*, 34(21), 2007. ***NASA Aura Mission Science highlight. NASA GSFC Atmospheric Chemistry and Dynamics Branch selected publication. JCTE science highlight.*** (3 citations)

50. Loughner, C.P., et al., A Method to Determine the Spatial Resolution Required to Observe Air Quality from Space. *IEEE Transactions on Geoscience and Remote Sensing*, 45(5): p. 1308-1314, 2007. Part 2. **A student paper.** (2 citations)
51. Noelle, A., et al., UV/Vis Spectra Data Base, A. Noelle, G.K. Hartmann, D.J. Lary, S. Le Calve, S. Trick, W.-U. Palm, A.-C. Vandaele, R.P. Wayne, and C.Y.R. Wu, Editors. 2007, science-softCon, <http://www.science-softcon.de/uv-vis.htm>,
52. Bae, H., et al., The Drought Response of Theobroma Cacao (Cacao) and the Regulation of Genes Involved in Polyamine Biosynthesis by Drought and Other Stresses. *Plant Physiology and Biochemistry*, 46(2): p. 174-188, 2008.
53. Brown, M.E., et al., Neural Networks as a Tool for Constructing Continuous NDVI Time Series from AVHRR and MODIS. *International Journal of Remote Sensing*, 29(24): p. 7141-7158, 2008.
54. Lary, D.J., Objectively Optimized Earth Observing Systems, in *Intelligent Aerial Vehicles*, T.M. Lam, Editor. 2008, <http://www.books.i-techonline.com/books.php>, **invited contribution.**
55. Lary, D.J. and O. Aulov, Space-Based Measurements of HCl: Intercomparison and Historical Context. *Journal of Geophysical Research-Atmospheres*, 113(D15), 2008. (1 citations)
56. Noelle, A., et al., UV/Vis Spectra Data Base, A. Noelle, G.K. Hartmann, A. Fahr, D.J. Lary, S. Le Calvé, J.J. Orlando, A.-C. Vandaele, R.P. Wayne, and C.Y.R. Wu, Editors. 2008, science-softCon, <http://www.science-softcon.de/uv-vis.htm>
57. Schoeberl, M.R., et al., QBO and Annual Cycle Variations in Tropical Lower Stratosphere Trace Gases from HALOE and Aura MLS Observations. *Journal of Geophysical Research-Atmospheres*, 113(D5), 2008. (6 citations)
58. Lary, D.J., et al., Machine Learning and Bias Correction of MODIS Aerosol Optical Depth. *IEEE Trans. on Geoscience and Remote Sensing*, *IEEE Geoscience and Remote Sensing Letters*, 6, 694-698, 2009.
59. Lary, D. J., Artificial intelligence in Aerospace, *Aerospace Technologies Advancements*. ed. by T. T. Arif, Vukovar, Croatia, IN-TECH: 1-24, 2010, **invited contribution.**
60. Lary, D. J., Artificial intelligence in Geoscience and Remote Sensing, *Geoscience and Remote Sensing, New Achievements*. ed. by P. Imperatore and D. Riccio, Vukovar, Croatia, IN-TECH: 1-24, 2010, **invited contribution.**
61. Cooke, M. C., S. R. Utembe, P. G. Carbajo, A. T. Archibald, A. J. Orr-Ewing, M. E. Jenkin, R. G. Derwent, D. J. Lary and D. E. Shallcross, Impacts of Formaldehyde Photolysis Rates on Tropospheric Chemistry. *Atmospheric Science Letters*, 11: 33-38, 2010
62. Lary, D. J., A. Nikitkov and D. N. Stone, Which Machine-Learning Models Best Predict Online Auction Seller Deception Risk? 2010 American Accounting Association (AAA) Strategic and Emerging Technologies.
63. Noelle, A, G K Hartmann, A Fahr, D. J. Lary, S. Le Calvé, Y.-P. Lee, P. Limao-Vieira, J.F. Martin-Torres, J. J. Orlando, A.-C. Vandaele, R P Wayne, and C Y R Wu. 2011. 8th edition UV/Vis Spectra Data Base. science-softCon.
64. Lary, D. J. et al, 2012. Applications of Remote Sensing in Tracking Airborne Diseases, in *Environmental Tracking for Public Health Surveillance*. Editors, Morain , S.A. and Budge, A.M., *International Society for Photogrammetry and Remote Sensing Book Series* (Vol # TBD), Taylor & Francis CRC: Balkema Press., accepted and in press.
65. Khan, M.A., Schaefer, D., Zondlo, M.A., Harrison, A., Roscoe, B., Lary, D.J. (2012), Open-Path Greenhouse Gas Sensors for UAV applications, *Remote Sensing, Special Issue Unmanned Aerial Vehicles (UAVs)*, accepted and in press.

Visiting Professorship

Benjamin Meaker Visiting Professorship, University of Bristol, England, Summer 2009.

Invited