

Geoffrey Crowley

a) Professional Preparation:

University of Durham, UK	Pure Physics (Hons)	B.Sc., 1978
University of Leicester, UK	Ionospheric Physics	Ph.D., 1985

b) Appointments:

University of Texas at San Antonio, Physics Dept., (Research Professor, 2006-Present)
ASTRA, San Antonio, TX (President/Chief Scientist, 2005-present)
Southwest Research Institute (Staff Scientist, 2001-2006); (Principal Scientist, 1997-2001); (Senior Research Scientist, 1996-1997)
Johns Hopkins University/Applied Physics Laboratory (Senior Research Scientist, 1992-1996)
UMass. Lowell, MA (Senior Research Staff, 1989-1992)
National Center for Atmospheric Research (Visiting Scientist, 1986-1989)
University of Leicester, UK (Research Associate, 1985-1986)

c) Synergistic Activities:

Author (or co-author) >70 publications in refereed journals, from the magnetosphere to the mesosphere
PI or Co-I on 42 funded proposals (between 1992-present)
Chair, AGU Chapman Conference Committee (2006-present)
Chair, AGU Scarf Award committee (2004-present)
Ex officio, SPA Executive Committee for the AGU (2004-present)
Science Definition Team, NASA Global Electrodynamics Connections (GEC) mission (2000-present)
Associate member, Center for Integrated Space-weather Modeling (CISM) team (2004-present)
Science team, C/NOFS satellite (2002-present)
Co-investigator Global Ultra-Violet Imager on NASA's TIMED satellite (2000-present)
Research Professor, University of Texas at San Antonio (2006-present)
Member - NASA Living With a Star Management Operations Working Group (2004-2006);
Member - NASA LWS TR& T Science Steering Committee (2003-2004);
Member - NASA LWS Targeted Research and Technology Science Definition Team (2001-2002);
Postdoc Sponsor/Supervisor for Tom Immel - now at U.C. Berkeley (1998-2000)
Postdoc Sponsor/Supervisor for Aaron Ridley - now at U. Michigan (1997-1998)
PhD Supervisor for Jacqueline Schoendorf, UMass Lowell (Adjunct Professor, 1990-1993)

d) Publications

2007

Bust, G. S., and G. Crowley (2007), Tracking of polar cap ionospheric patches using data assimilation, *J. Geophys. Res.*, 112, A05307, doi:10.1029/2005JA011597.
Bust, G. S., G. Crowley, T. W. Garner, T. L. Gaussiran II, R. W. Meggs, C. N. Mitchell, P. S. J. Spencer, P. Yin, and B. Zapfe (2007), Four-dimensional GPS imaging of space weather storms, *Space Weather*, 5, S02003, doi:10.1029/2006SW000237.
Crowley, G., and R.H. Tolson, (2007), Mars Thermospheric Winds from MGS and Odyssey Accelerometers, *J. Spacecraft and Rockets*, 44(6), doi:10.2514/1.28625.
Kozyra, J.U., G. Crowley, B. A. Emery, X. H. Fang, G. Maris, M. G. Mlynyczak, R. J. Niciejewski, S. E. Palo, L. J. Paxton, C. E. Randall, P.-P. Rong, J. M. Russell III, W. Skinner, S. C. Solomon, E. R. Talaat, Q. Wu, J.-H. Yee, Response of the Upper/Middle Atmosphere to Coronal Holes and Powerful High-Speed Solar Wind Streams in 2003, AGU Monograph on High Speed Solar Streams, (Ed. B. Tsurutani), in press, 2007.

2006

Crowley, G., T. Garner, A.D. Richmond and R.G. Roble, Modeling Storm Enhanced Density (SED) Features Using TIMEGM and AMIE, submitted to GRL, 2006.

Crowley, G., C. Hackert, R. R. Meier, D. J. Strickland, L. J. Paxton, X. Pi, A. Manucci, A. Christensen, D. Morrison, G. Bust, R. G. Roble, **N. Curtis**, G. Wene, (2006), Global thermosphere-ionosphere response to onset of 20 November 2003 magnetic storm, *J. Geophys. Res.*, 111, A10S18, doi:10.1029/2005JA011518.

Crowley, G., T. J. Immel, C. L. Hackert, J. Craven, and R. G. Roble (2006), Effect of IMF B_y on thermospheric composition at high and middle latitudes: 1. Numerical experiments, *J. Geophys. Res.*, 111, A10311, doi:10.1029/2005JA011371.

Goncharenko, L., J. Salah, **G. Crowley**, L. J. Paxton, Y. Zhang, A. Coster, W. Rideout, C. Huang, S. Zhang, B. Reinisch, and V. Taran, (2006), Large variations in the thermosphere and ionosphere during minor geomagnetic disturbances in April 2002 and their association with IMF B_y , *J. Geophys. Res.*, 111, A03303, doi:10.1029/2004JA010683.

Huang, C., S. Sazykin, R. Spiro, J. Goldstein, **G. Crowley**, and J. M. Ruohoniemi (2006), Storm-Time Penetration Electric Fields and Their Effects, *Eos Trans. AGU*, 87(13), 131.

Immel, T. J., **G. Crowley**, C. L. Hackert, J. D. Craven, and R. G. Roble (2006), Effect of IMF B_y on thermospheric composition at high and middle latitudes: 2. Data comparisons, *J. Geophys. Res.*, 111, A10312, doi:10.1029/2005JA011372.

2005

Crowley, G., C. Hackert, R. R. Meier, D. J. Strickland, L. J. Paxton, X. Pi, A. Manucci, A. Christensen, D. Morrison, G. Bust, R. G. Roble, N. Curtis, J. Bronn, and G. Wene, Global Thermosphere-Ionosphere Response to Geomagnetic Storms, Proceedings of the Ionospheric Effects Symposium, Alexandria, VA, May 2005 (Ed: J. Goodman)

Meier, R. R., **G. Crowley**, D. J. Strickland, A. B. Christensen, L. J. Paxton, D. Morrison, and C. L. Hackert (2005), First look at the 20 November 2003 superstorm with TIMED/GUVI: Comparisons with a thermospheric global circulation model, *J. Geophys. Res.*, 110, A09S41, doi:10.1029/2004JA010990.

Mlynczak, M. G., F. Javier Martin-Torres, **G. Crowley**, D.P. Kratz, B. Funke, M. Lopez-Puertas, J. M. Russell III, J. Kozyra, C. Mertens, R. Sharma, L. Gordley, D. Picard, J. Winick and L. Paxton, (2005), Energy transport in the thermosphere during the solar storms of April 2002, *J. Geophys. Res.*, 110, A12S25, doi:10.1029/2005JA011141.

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Schlegel, K., H. Luhr, J. P. ST. Maurice, **G. Crowley** and C. Hackert, Thermospheric Density Structures Over the Polar Regions Observed With CHAMP, *Ann. Geophys.*, 23, 1659-1672, 2005.

2004

Lima, W., F. Becker-Guedes, Y. Sahai, P. R. Fagundes, J. R. Abalde, **G. Crowley**, and J. A. Bittencourt, Response of the Equatorial and Low-Latitude Ionosphere during the Space Weather Events of April 2002, *Ann. Geophys.*, 22, 3211-3219, 2004

Sahai, Y., P. R. Fagundes, F. Becker-Guedes, J. R. Abalde, **G. Crowley**, X. Pi, K Igarashi, G. M. Amarante, A. A. Pimenta, and J. A. Bittencourt, Longitudinal Difference Observed in the Ionospheric F-Region During the Major Geomagnetic Storm of March 31, 2001, *Ann. Geophys.*, 22, 3221-3229, 2004

Strickland, D. J., R. R. Meier, R. L. Walterscheid, J. D. Craven, A. B. Christensen, L. J. Paxton, D. Morrison, and **G. Crowley**, (2004), Quiet-time seasonal behavior of the thermosphere seen in the far ultraviolet dayglow, *J. Geophys. Res.*, 109, A01302, doi:10.1029/2003JA010220.

2003

Christensen, A. B., Paxton, L. J., Avery, S., Craven, J., **Crowley, G.**, Humm, D. C., Kil, H., Meier, R. R., Meng, C.-I., Morrison, D., Ogorzalek, B. S., Straus, P., Strickland, D. J., Swenson, R. M., Walterscheid,

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2002

Sharber, J. R., J. D. Winningham, R. A. Frahm, **G. Crowley**, A. J. Ridley, and R. Link, Construction of a particle climatology for the study of solar particle fluxes on the atmosphere, *Adv. Space Res.*, Vol. 29, No.10, 1513-1522, 2002.

2001

Crowley, G., and C. L. Hackert (2001), Quantification of high latitude electric field variability, *Geophys. Res. Lett.*, 28(14), 2783-2786.

Immel, T. J., **G. Crowley**, J. D. Craven, and R. G. Roble (2001), Dayside enhancements of thermospheric O/N₂ following magnetic storm onset, *J. Geophys. Res.*, 106(A8), 15,471-15,488.

2000

Crowley, G., A. J. Ridley, D. Deist, S. Wing, D. J. Knipp, B. A. Emery, J. Foster, R. Heelis, M. Hairston, and B. W. Reinisch (2000), Transformation of high-latitude ionospheric F region patches into blobs during the March 21, 1990, storm, *J. Geophys. Res.*, 105(A3), 5215-5230.

Fesen, C. G., **G. Crowley**, R. G. Roble, A. D. Richmond, and B. G. Fejer (2000), Simulation of the pre-reversal enhancement in the low latitude vertical ion drifts, *Geophys. Res. Lett.*, 27(13), 1851-1854.

Frahm, R. A., J. D. Winningham, J. R. Sharber, R. Link, **G. Crowley**, E. E. Gaines, D. L. Chenette, B. J. Anderson, and T. A. Potemra (2000), Reply, *J. Geophys. Res.*, 105(D12), 15,685-15,687.

Ridley, A. J., **G. Crowley**, and C. Freitas (2000), An empirical model of the ionospheric electric potential, *Geophys. Res. Lett.*, 27(22), 3675-3678.

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Sharber, J. R., J. D. Winningham, R. A. Frahm, **G. Crowley**, A. J. Ridley, and R. Link, Empirical modeling of particle precipitation and the study of effects on the terrestrial thermosphere and ionosphere, *Phys. Chem. Earth(C)*, Vol.25, No. 5-6, 489-493, 2000.

1999

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Crowley, G., A. Ridley, D. Winningham, R. Frahm, J. Sharber, and J. Russell III (1999), On the hemispheric symmetry in thermospheric nitric oxide, *Geophys. Res. Lett.*, 26(11), 1545-1548.

Freitas, C. J. and **G. Crowley**, "Space Weather Simulation on Networks of Workstations," Proceedings, Forum on Parallel Computing Methods, 1999 ASME, International Mechanical Engineering Congress & Exposition, Nashville, TN, November 14-19, FED-Vol. 250, pp. 273-280, 1999.

Ridley, A. J., **G. Crowley**, R. Link, R. Frahm, J. D. Winningham, J. R. Sharber, and J. Russell III (1999), Variations of the thermospheric nitric oxide mass mixing ratio as a function of Kp, altitude, and magnetic local time, *Geophys. Res. Lett.*, 26(11), 1541–1544.

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Crowley, G., A. Ridley, D. Winningham, R. Frahm, J. Sharber, and J. Russell III (1998), Nitric oxide variations in the *mesosphere* and lower *thermosphere* during the November 1993 *storm* period, *J. Geophys. Res.*, 103(A11), 26,395–26,408.

Sharber, J. R., R. A. Frahm, R. Link, **G. Crowley**, J. D. Winningham, E. E. Gaines, R. W. Nightingale, D. L. Chenette, B. J. Anderson, and C. A. Gurgiolo (1998), UARS *particle* environment monitor observations during the November 1993 *storm*: *Auroral morphology*, spectral characterization, and energy deposition, *J. Geophys. Res.*, 103(A11), 26,307–26,322.

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Frahm, R. A., J. D. Winningham, J. R. Sharber, R. Link, **G. Crowley**, E. E. Gaines, D. L. Chenette, B. J. Anderson, and T. A. Potemra (1997), The diffuse aurora: A significant source of ionization in the middle atmosphere, *J. Geophys. Res.*, 102(D23), 28,203–28,214.

Buonsanto, M.J., **G. Bust**, R. Clark, M. Codrescu, **G. Crowley**, B. A. Emery, T. J. Fuller-Rowell, G. Hoogeveen, A. Jacobson, D. Knipp, S. Maurits, P. G. Richards, J. R. Taylor, and B. J. Watkins, Recent Results of the CEDAR Storm Study, *Advances in Space Research*, 20 (9), 1655-1664, 1997.

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Crowley, G., J. Schoendorf, R. G. Roble, and F. A. Marcos, Neutral density cells in the lower thermosphere at high latitudes, *Adv. Space Res.*, 18 (3), 69-74, 1996.

Schoendorf, J., **G. Crowley**, and R.G. Roble, Formation mechanism for thermospheric neutral density cells at high latitudes, *J. Atmos. Terr. Phys.*, 58, 1769-1781, 1996

Schoendorf, J., **G. Crowley**, R.G. Roble and F.A. Marcos, Neutral Density Cells in the high latitude thermosphere: morphology for solar maximum deduced from TIGCM simulations, *J. Atmos. Terr. Phys.*, 58, 1751-1768, 1996

1995

Crowley, G., J. Schoendorf, R. G. Roble and F. A. Marcos, Satellite observations of neutral density cells in the lower thermosphere at high latitudes, AGU Monograph 87 on the Mesosphere and Lower Thermosphere, 339-348, 1995.

Schoendorf, J., and **G. Crowley** (1995), Interpretation of an unusual high latitude density decrease in terms of thermospheric density cells, *Geophys. Res. Lett.*, 22(22), 3023–3026.

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1994

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1993

- Anderson, D. E., J. H. Yee, L. J. Paxton, G. Crowley, G. J. Romick, J. F. Carbary and C. I. Meng, Global modeling of UV/Visible emissions from space: retrieval of mesosphere/lower thermosphere pressure, temperature and ozone, Proceedings of International Symposium on Spectral Sensing Research, Maui, Hawaii, 1993.
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1992

- Cannon, P. S., **G. Crowley**, B. W. Reinisch, and J. Buchau (1992), Digisonde measurements of polar cap convection for northward interplanetary magnetic field, *J. Geophys. Res.*, 97(A11), 16,877–16,885.
- Crowley, G.**, P. S. Cannon, C. G. Dozois, B. W. Reinisch, and J. Buchau (1992), Polar Cap Convection for B_z Northward, *Geophys. Res. Lett.*, 19(7), 657–660.

1991

- Crowley, G.**, Dynamics of the Earth's thermosphere: A Review, *Rev. Geophys.*, 29, 1143-1165, 1991.

1990

- Crowley, G.**, J. Buchau, B. W. Reinisch, P. Hoeg, Cusp signatures from the Digisonde?, Proceedings of the GEM Workshop Intercalibrating Cusp Signatures, October, 1990.

1989

- Burns, A. G., T. L. Killeen, **G. Crowley**, B. A. Emery, and R. G. Roble (1989), On the mechanisms responsible for high-latitude thermospheric composition variations during the recovery phase of a geomagnetic storm, *J. Geophys. Res.*, 94(A12), 16,961–16,968.
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1988

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1987

Crowley, G., W. J. Hughes, and T. B. Jones, Observational evidence of cavity modes in the Earth's magnetosphere, *J. Geophys. Res.*, 92, 12233-12240, 1987.

Crowley, G., T.B. Jones, and J.R. Dudeney, Comparison of short period TID morphologies in Antarctica during geomagnetically quiet and active intervals, *J. Atmos. Terr. Phys.*, 49, 155, 1987.

Crowley, G., P.J.S. Williams, Observation of the source and propagation of atmospheric gravity waves, *Nature*, 328, 231-233, July 16, 1987.

1985

Crowley, G., N. M. Wade, J. A. Waldock, T. R. Robinson, and T. B. Jones, High time-resolution heating associated with a Pc5 micropulsation, *Nature*, 316, 528-530, 1985.

1984

Crowley, G., J. R. Dudeney, A. S. Rodger, and T. B. Jones, Large Simultaneous Disturbances (LSD) in the Antarctic ionosphere, *Antarctic J. US*, XV, 213-214,

Crowley, G., T. B. Jones, T. R. Robinson, N. M. Wade, and O. Holt, Determination of vertical neutral temperature and wind profiles using EISCAT and HF Doppler radar, *J. Terr. Atmos. Phys.*, 46, 501-507, 1984.

1980

Dudeney, J. R., **G. Crowley**, and T. B. Jones, Large simultaneous disturbances in the Antarctic ionosphere, *Antarctic J. US*, XV, 213-214, 1980.

e) Presentations

2007

Bust, G., Crowley, G., Curtis, N., Reynolds, A., Paxton, L., Coker, C., Bernhardt, P., IDA4D – a new ionospheric imaging algorithm using non-linear ground-based and spaced-based data sources, presented at the Fall AGU Meeting, San Francisco, CA, December 2007

Kozyra, J U., **Crowley, G.**, Doe, R A., Mlynczak, M G., Paxton, L J., Skinner, W R., Solomon, S C., Talaat, E., Woods, T N., Wu, Q., Yee, J, Overview of TIMED CEDAR observations showing the MLTI system response to changing drivers from solar maximum to solar minimum, presented at the Fall AGU Meeting, San Francisco, CA, December 2007

Erickson, P J., Goncharenko, L P., Nicolls, M J., **Crowley, G.**, Kelley, M C., Dynamics of American Sector Mid and Low Latitude Ionospheric and Thermospheric Response During the November 2004 Superstorm, presented at the Fall AGU Meeting, San Francisco, CA, December 2007

Crowley, G., Thermospheric Response to Energy and Momentum Inputs from the Magnetosphere, presented at the Fall AGU Meeting, San Francisco, CA, December 2007

Crowley G., Relationship Between Thermospheric Density and Nitric Oxide, presented at the Air Force MURI Kick-off Meeting, Boulder, CO, November 2007

Crowley G., Thermospheric Density Cells at High Latitudes, presented at the Air Force MURI Kick-off Meeting, Boulder, CO, November 2007

Crowley G., Relationship between Density and Joule Heating: A Numerical Experiment Using the TIMEGCM Model, presented at the Air Force MURI Kick-off Meeting, Boulder, CO, November 2007

Crowley G., B. Tapley, M. Cheng, J. Ries, and S. Solomon, LWS: Effect of EUV and High Latitude Forcing on Thermospheric Densities, presented at the LWS Focused Science Team Meeting, Boulder, CO, September 2007

- Crowley G.**, B. Tapley, M. Cheng, J. Ries, J. Forbes, E. Sutton, and S. Bruinsma, LWS: Effect of Neutral Winds on CHAMP and GRACE Density Measurements, presented at the LWS Focused Science Team Meeting, Boulder, CO, September 2007
- Crowley G.**, and **G. S. Bust**, Tracking of Polar Cap Ionospheric Patches Using Data Assimilation, presented at the NSF CEDAR Workshop, Santa Fe, NM, June 2007
- Crowley G.**, **N. Curtis**, and **A. Reynolds**, November 2004 Storm Study using TIMEGCM and GUVI, presented at the NSF CEDAR Workshop, Santa Fe, NM, June 2007
- Crowley G.**, **N. Curtis**, M. Larsen, A. Richmond, and R. Roble, AMIE & TIMEGCM Results For The Joule-2 Rocket Campaign of January 2007, presented at the NSF CEDAR Workshop, Santa Fe, NM, June 2007
- Kelly, M.C., Nicolls, M.J., **Crowley, G.**, Varney, R., Huang, C., Retterer, J., Erickson, P., Goncharenko, L., Extreme Equatorial and Low-Latitude Electric Fields and Thermosphere Winds During a Superstorm, presented at the NSF CEDAR Workshop, Santa Fe, NM, June 2007
- Erickson, P J., Goncharenko, L P., Nicolls, M J., **Crowley, G.**, Kelley, M C., Dynamics of American Sector Mid and Low Latitude Ionospheric and Thermospheric Response During the November 2004 Superstorm, presented at the NSF CEDAR Workshop, Santa Fe, NM, June 2007
- Crowley G.**, and **G. S. Bust**, Modeling Magnetosphere-Ionosphere Coupling at High Latitudes, NSF GEM Workshop, Zermatt, Utah, June 2007
- Straus, P.R., R. Bishop, **Crowley, G.**, GPS Occultation Measurements of Post-Sunset E-Region Conductivity, Spring AGU, Acapulco, MX, 2007
- Anderson, P.C., **Crowley, G.**, Johnston, W.R., Global Effects of Subauroral Electric Fields on the Thermosphere, Spring AGU, Acapulco, MX, 2007
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Crowley, G., and T. Immel *Joule Heating: Sensitivity Studies Using AMIE* NASA/TIMED/GUVI Instrument Team Meeting Ingram, TX, 4/26-4/29/00

Crowley, G., R. Niciejewski, P. Knoop, and A. Burns *Toward An Electronic Workshop using SPARC* Space Physics and Aeronomy Research Collaboratory (SPARC) Team Meeting Ann Arbor, MI 4/12-4/14/00.

Crowley, G., J. Schoendorf, F. Marcos, and R. G. Roble *Neutral Density Structures in the Lower Thermosphere at High Latitudes (Poster)* Chapman Conference on "Space Weather" Clearwater, FL, 3/20-3/22/00.

1999

T. Immel, **G. Crowley**, and J. D. Cravens *Global FUV Imaging for Determination of Thermospheric Storm Effects*

Fall Meeting of the AGU San Francisco, CA Dec. 1999

G. Crowley, T. Immel, A. Ridley, D. J. Knipp, B. A. Emery, D. Lummerzheim, and M. Ruohoniemi *Effects of Temporal and Spatial Resolution on Joule Heating Estimates from AMIE* Fall Meeting of the AGU San Francisco, CA, Dec. 1999

J. Sojka, **G. Crowley** and the Science Technology Definition Team for the GEC *Mission Synchronized Deep Dipping by the GEC Satellites* Fall Meeting of the AGU San Francisco, CA, Dec. 1999

Paxton, Larry J., Daniel Morrison, **Geoff Crowley**, Douglas J Strickland, Gerry J Romick, Andrew B Christensen, Ching I Meng *Multispectral Far Ultraviolet Images: The Effect of Neutral Atmosphere Composition and Temperature on the Retrievals* Fall Meeting of the AGU, San Francisco, CA, Dec. 1999

Frahm, R. A., J. R. Sharber, J. D. Winningham, **G. Crowley**, A. J. Ridley, and R. Link *Climatology for Studying the Effects of Particles on the Atmosphere* NASA Upper Atmospheric Research Satellite (UARS) Science Team Meeting Virginia Beach, Virginia, October 26-28, 1999.

G. Crowley, G. Thomas, R.G. Roble and J. Olivero *Modeling the Thermal Structure and Dynamics of the Mesosphere at Solstice* NASA Upper Atmospheric Research Satellite (UARS) Science Team Meeting Virginia Beach, VA, October 1999.

G. Crowley, C. Fesen, T. Immel, A. Ridley, R. Roble, A. Richmond, D. Knipp *Global Joule Heating and the Thermosphere/Ionosphere Response* Meeting of the International Union of Geodesy and Geophysics

Birmingham, England, UK, July 1999.

G. Crowley, C. Freitas, A. Ridley, D. Winningham *Next Generation Space Weather Specification and Forecasting Model* Ionospheric Effects Symposium Alexandria, VA, May 1999.

Crowley, G., A. Ridley, D. Knipp, J. Lyon, C. Goodrich, M. Wiltberger *Coupling Ionosphere-Thermosphere and MHD Magnetospheric Models* Spring Meeting of AGU, May, 1999

Ridley, A., **G. Crowley**, T. Immel, D. Knipp, D. Lummerzheim, J. Thayer, R. Doe, M. Ruohoniemi, B.J. Anderson, B. Emery, A.D. Richmond, R.G. Roble *Validation of Conductivity and Joule Heating from AMIE and TIEGCM*

Spring Meeting of AGU, May, 1999

Sharber, J.R., J.D. Winningham, R.A. Frahm, **G. Crowley**, A. J. Ridley, R. Link *Developing a Particle Climatology for studying of the effects of Solar Particle Fluxes on the Atmosphere (Poster)* Spring Meeting of AGU, May, 1999

Knipp, D.J., A.J. Ridley, **G. Crowley**, T. Immel, B.A. Emery, D. Lummerzheim *Quantitative Sensitivity Assessments for the Assimilative Mapping of Ionospheric Electrodynamics Procedure* Spring Meeting of AGU, May, 1999

Solomon, S.C., C.A. Barth, S.M. Bailey, W. Wang, T.L. Killeen, A.G. Burns, **G. Crowley**, A. Ridley, D. Lummerzheim *Measurements and Models of Thermospheric Nitric Oxide Produced by Auroral Precipitation* Spring Meeting of AGU, May, 1999

G. Crowley, G. Thomas, R. G. Roble, J. Olivero, H. Liu *Modeling the Thermal Structure and Dynamics of the Summer Mesosphere* Chapman Conference on "Across the Stratopause" Annapolis, MD, April 1999.

G. Crowley, A. Ridley, C. Freitas, R. Roble, A. Richmond, *Ionosphere-Thermosphere Model in Distributed Computing Environment (Poster)* Spaceweather: Research to Applications Conference, Boulder, CO, April 1999

James M. Russell III, Scott M. Bailey, Robert R. Conway, **Geoff Crowley**, Stephen D. Eckermann, John M. Harlander, Mihaly Horanyi, Larry L. Gordley, Cora Randall, David W. Rusch, Glen W. Sachse, David E. Siskind, Michael E. Summers, Michael H. Stevens, Gary E. Thomas, James C. Ulwick *Polar Mesospheric Clouds and Global Change: A Solar Terrestrial Probe for Sun Earth Connections* NASA Sun-Earth Connections Roadmap Workshop, Washington DC, April 1999

1998

Winningham, J. D., J. R. Sharber, R.A. Frahm, **G. Crowley**, A. J. Ridley, R. Link *A Particle Climatology for the Study of the Effects Solar Particle Fluxes on the Atmosphere* Fall Meeting of AGU, December 1998

Wise, J. O., R. R. O'Neil, J.R. Winick, **G. Crowley**, U. B. Makhlof, M. Conde, M. Kendra *MAX/SPIRIT III Infrared Measurements of the Polar Atmosphere Jan. 9-10, 1997* Fall Meeting of AGU, December 1998

Ridley, A. J., **G. Crowley** *A Time Dependent Near-Real-Time Assimilative Mapping of Ionospheric Electrodynamics Technique* Fall Meeting of AGU, December 1998

Fesen, C. G., A. D. Richmond, **G. Crowley**, *Investigation of the Pre-reversal Enhancement in the NCAR TIEGCM*

Fall Meeting of AGU, December 1998

Crowley, G., C. Freitas, A. Ridley, D. Winningham, R. Murphy, R.G. Roble, A.D. Richmond *Next-Generation Model for Space Weather Specification and Forecasting* Fall Meeting of AGU, December 1998

Crowley, G., A. Ridley, D. Winningham, R. Frahm, J. Sharber, R.G. Roble, J.M. Russell III *Modeling the Nitric Oxide Response to Particle Precipitation* Fall Meeting of AGU, December 1998

Crowley, G., T. Immel, A. Ridley, C. Fesen, O. Kivanc, R.G. Roble, A.D. Richmond, B.A. Emery *Global Joule Heating and the Thermosphere/Ionosphere Response* Fall Meeting of AGU, December 1998

Frahm, R. A., R. Link, J. D. Winningham, J. R. Sharber, **G. Crowley**, A. J. Ridley, E. E. Gaines, D. L. Chenette, and W. R. Keith, *Atmospheric Ionization Rates from PEM Electron Data: Differential and Integral Differences-Method 2* Fall 1998 AGU Meeting Dec. 1998

Crowley, G., G. Thomas, J. Olivero, R.G. Roble *Simulation of PMCs Using the TIME-GCM (Invited Talk)*

Workshop on Layered Phenomena Kuhlungsborn, Germany, September 1998

Crowley, G., Yee, R. G. Roble, Skinner, Burrage, and Hays *Global Simulation and Observation of the O (¹S), O₂ (¹Σ) and OH Mesosphere Nightglow Emissions* Workshop on Layered Phenomena Kuhlungsborn, Germany, September 1998

Sharber, J. R., J. D. Winningham, R. Frahm, **G. Crowley**, A. J. Ridley, R. Link *Construction of a particle climatology for the study of solar particle fluxes and their effects on the atmosphere* First COSPAR/SCOSTEP Workshop of International Solar Cycle Study Nagoya, Japan, July 1998 Sept. 1998

Crowley, G., J. D. Winningham, R. Frahm. J. Sharber, A. Ridley, and R. Link, *Climatology of precipitating particles and their effects on the middle atmosphere* First International TIGER (Thermospheric Ionospheric Geospheric Research) Symposium Freiburg, Germany, June 18-19, 1998.

R. A. Frahm, **G. Crowley**, J. R. Sharber, J. D. Winningham, R. Link, and A. J. Ridley, E. E. Gaines and D. L. Chenette, B. J. Anderson and T. A. Potemra *A Global PEM Electron Precipitation Climatology for the Kp Index: Work in Progress* UARS Science Team Meeting, May 1998

Crowley, Frahm, Winningham, Sharber, Ridley, Link, Roble *Climatology of Precipitating Particles and Their Effects on the Middle Atmosphere*, UARS Science Team Meeting, May 1998

Crowley, G., Chris Freitas, Aaron Ridley, David Winningham, Richard Murphy, Richard Link *Multidisciplinary Space Science Simulation in a Distributed Heterogeneous Environment* DIPCM Workshop, Dulles, May 1998.

Frahm, R. A., R. Link, J. D. Winningham, J. R. Sharber, **G. Crowley**, A. J. Ridley, M. V. Codrescu, E. E. Gaines, and D. L. Chenette *Atmospheric ionization rates from PEM electron data: Differential and Integral Differences*

Spring Meeting of AGU, May 1998

Sharber, J.R., R.A. Frahm, **G. Crowley**, A.J. Ridley, R. Link, J.D. Winningham, E.E. Gaines, R.W. Nightgale, D.L. Chenette, W.R. Keith *The UARS PEM Energetic Particle Climatology- Status and Applications*

Spring Meeting of AGU, May 1998.

Crowley, G., A. Ridley, R. Link, D. Winningham, R. Frahm, J. Sharber, R. Roble, A. Richmond and J. Russell III, *Particle Effects on the Middle Atmosphere Modeled using the Parallel zed TIME-GCM* Spring AGU Meeting, May 1998.

1997

R W Nightingale, E. E. Gaines, and D L Chenette, J R Sharber, R A Frahm, **G Crowley**, R Link, and J D Winningham *The Global Hemispheric Input Power From Electrons During the November 1993 Storm as Determined by the UARS PEM*, Fall AGU Meeting, San Francisco, December 1997

Frahm, R. A., J. R. Sharber, R. Link, **G. Crowley**, and J. D. Winningham, E. E. Gaines, and D. L. Chenette *Atmospheric Ionization Rates for Electron Distribution Shapes: Kappa and Maxwellian Differences* Fall Meeting of AGU, December 1997.

Crowley, G., R. Frahm, A. Ridley, D. Winningham, J. Sharber, R. Link, R.G. Roble, J.M. Russell *Modeling the Effects of Diffuse Auroral Precipitation on the Upper Stratosphere and Mesosphere* Fall Meeting of AGU, December 1997.

G. Crowley *Overview of Ionospheric Research in the Instrumentation and Space Physics Division*
Presented informal colloquium to promote collaboration between SwRI and ARL UT Austin, TX., Sept.
1997

Crowley, Emery, Ridley, Richards, Buonsanto *Modeling the November 1993 Storm using the NCAR-TIEGCM*

Coupling Energetics and Dynamics of Atmospheric Regions (CEDAR) Workshop Boulder CO. July
1997

Chairman of working group on Ion-Neutral Interactions TIMED/CEDAR Workshop at the NSF-
CEDAR meeting (Presented summary of working group deliberations). Boulder, CO. June 1997

Killeen, T. L., D. Atkins, G. Olson, T. Finnholt, F. Jahanian, A. Prakash, T. Weymouth, J. Kelly, Y.
Zambre, E. Sanchez, S. Gonzales, A. Van Eyken, **G. Crowley**, V. Papitashvili, J. Cumnock, A. Burns,
M. Acuna, G. Parks *The Upper Atmosphere Research Collaboratory (UARC) WWW-based Campaign*
Spring AGU meeting in Baltimore, MD. May 1997

Chairman of working group on Ion-Neutral Interactions TIMED/CEDAR Collaborative Workshop
(Presented summary of working group deliberations). Columbia, MD. April 1997

Other papers at the UARS Science Team Meeting with Frahm Link Sharber As 1st authors. April 1997

Crowley, G., J. D. Winningham, R. Frahm, J. Sharber, and R. G. Roble *Mesospheric and Stratospheric
Effects of Particle Precipitation as Modeled by the NCAR TIME-GCM* UARS Science Working Group
San Antonio, TX. April 1997

Crowley et al., *Remote Sensing of Joule heating from Space* TIMED/CEDAR Collaborative Workshop
Columbia, MD. April 1997

G. Crowley *How to organize a scientific workshop: The ETS Experience* UARC Workshop at University
Michigan Center for Space Research. March 1997

Crowley, Emery, Richards *Results of modeling the November 1993 Storm using the NCAR TIEGCM*
CEDAR Storms Workshop Millstone Hill, Westford, MA. March 1997

1996

Crowley et al. *Remote Sensing of Joule heating from Space* Fall AGU, San Francisco, CA. Dec. 1996

Blanchard, P., E. P. Szuszczewicz, **G. Crowley**, T. Fuller-Rowell, G. Millward, P. Richards, and T.
Bullet *Real-Time Ionospheric Predictions and Ground-Truth Specifications for Optimized TSS-IR
Experiment Operations and Analyses* Fall AGU, San Francisco, CA. Dec. 1996

Frahm, R. A., J. R. Sharber, R. Link, R. **G. Crowley**, J. D. Winningham, E. E. Gaines, D. L. Chenette,
and R. G. Roble *Energetic Particle Inputs During the November 1993 Storm and Their Atmospheric
Influence*

Fall AGU, San Francisco, CA. Dec. 1996

Gladstone, R., R. Link, **G. Crowley**, S. C. Solomon, and P. H. Reiff *Simulation of IMAGE Far-
Ultraviolet Auroral Observation* Fall AGU, San Francisco, CA. Dec. 1996

G. Crowley, and S. Wing *Transformation of Polar Cap Ionospheric Patches into Blobs on the Nightside*
High Latitude Plasma Structures Workshop, Peaceful Valley, Boulder, CO. July 21, 1996

M. J. Buonsanto, **G. Bust**, R. Clark, M. Codrescu, **G. Crowley**, B. A. Emery, T. J. Fuller-Rowell, G.
Hoogeveen, A. Jacobson, D. Knipp, S. Maurits, P. G. Richards, J. R. Taylor, and B. J. Watkins *Recent
Results of the CEDAR Storm Study* 31st Scientific Assembly of COSPAR, Birmingham, England. July
1996

Yee, J. H., **G. Crowley**, R. G. Roble, Hays, Burrage, and Skinner *Atomic Oxygen from UARS/HRDI*
31st Scientific Assembly of COSPAR Birmingham, England, July 1996

G. Bust, R. Clark, M. Codrescu, **G. Crowley**, B. A. Emery, T. J. Fuller-Rowell, G. Hoogeveen, A. Jacobson, D. Knipp, S. Maurits, P. G. Richards, J. R. Taylor, and B. J. Watkins *Invited review paper on "Recent results of the CEDAR Storm Study"* by M. J. Buonsanto 31st Scientific Assembly of COSPAR, Birmingham, England. July 1996

G. Crowley, S. Wing, M. Buonsanto, B. Reinischat *Transformation of Polar Cap Ionospheric Patches into Blobs on the Nightside* Coupling Energetics and Dynamics of Atmospheric Regions (CEDAR) Workshop, Boulder, CO, 6/96

G. Crowley, S. Wing, M. Buonsanto, B. Reinischat *Transformation of Polar Cap Ionospheric Patches into Blobs on the Nightside* Coupling Energetics and Dynamics of Atmospheric Regions (CEDAR) Workshop, Boulder, CO, 6/96

Crowley, G., S. Yee, L. Paxton, A. Christensen *Joule Heating and the NASA-TIMED mission* Coupling Energetics and Dynamics of Atmospheric Regions (CEDAR) Workshop Boulder, CO. June 1996

Fesen, C.G., **G. Crowley**, A.D. Richmond, R.G. Roble, B. Fejer, L. Scherliess *Simulation of the Pre-Reversal Enhancement in the Low Latitude Vertical Ion Drift* Spring Meeting of AGU, June 1996

Yee, J.H., **G. Crowley**, R.G. Roble, *Effects of Planetary Scale Waves on Mesospheric Nightglow*
Spring Meeting of AGU, June 1996

Crowley, G., C.G. Fesen, R.G. Roble, A.D. Richmond *Validation of the NCAR TIEGCM for Solar Minimum Equinox Conditions* Spring Meeting of AGU, June 1996