

Tai-Yin Huang

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EDUCATION

Ph.D. in Physics, University of Cincinnati, 1997
M.S. in Physics, University of Cincinnati, 1993
B.Sc. in Physics, National Changhua University of Education, Taiwan, 1989

PUBLICATIONS

Articles Published in Refereed Journals

- Huang, T.-Y. (2008). Peering into peer review. *Physics Today*, Vol. **61**, No.12, 14.
- Huang, T.-Y., & Hickey, M. P. (2008). Secular variations of OH nightglow emission and of the OH intensity-weighted temperature induced by gravity-wave forcing in the MLT region. *Advances in Space Research*, doi:10.1016/j.asr.2007.10.020.
- Huang, T.-Y. & Hickey, M. P. (2007). On the latitudinal variations of the non-periodic response of minor species induced by a dissipative gravity-wave packet in the MLT region. *J. Atmos. Solar-Terr. Phys.*, doi: 10.1016/j.jastp.2007.01.011.
- Huang, T.-Y. (2006). Simulations of OH nightglow emission in the occurrence of sprites. *J. Geophys. Res.*, **111**, A11311, doi:10.1029/2006JA011791.
- Huang, T.-Y., Hickey, M. P., & Tuan, T. F. (2003). On nonlinear response of minor species with a layered structure to gravity waves. *J. Geophys. Res.*, **V108**.
- Hickey M. P., Huang, T.-Y., & Walterscheid, R. (2003). Gravity wave packet effects on chemical exothermic heating in the mesopause region. *J. Geophys. Res.*, **V108**.
- Huang, T.-Y., Hickey, M. P., Tuan, T. F., Dewan, E. M., & Picard, R. H. (2002). Further investigations of a mesospheric inversion layer observed in the ALOHA-93 Campaign. *J. Geophys. Res.*, **V107**, 4408.

- Hur, H., Huang, T.-Y., Zhao, Z., Karunanayaka, P., & Tuan, T. F. (2002). A theoretical model analysis of the sudden narrow temperature-layer formation observed in the ALOHA-93 Campaign. *Can. J. Phys.*, **80**, 1543.
- Huang, T.-Y., Hur, H., Tuan, T. F., Li, Xi, Dewan, E. M., & Picard, R. H. (1998). Sudden narrow temperature inversion-layer formation in ALOHA-93 as a critical-layer-interaction phenomenon. *J. Geophys. Res.*, **V103**, 6323.
- Munasinghe, G., Hur, H., Huang, T.-Y., Bhattacharyya, A., & Tuan, T. F. (1998). Application of the dispersion formula to long and short-period gravity waves; comparison with ALOHA-93 data and analytical model. *J. Geophys. Res.*, **V103**, 6467.

Parts of Books

- Huang, T.-Y., Chiang, C. Y., Kuo, C. L., Chen, A. B., Su, H. T., & Hsu, R. R. (2009). Investigations of Lightning-Induced Sudden Brightening in the OH Airglow Layer Observed by ISUAL Onboard FORMOSAT-II Satellite. In N. B. Crosby, T.-Y. Huang & M. Rycroft (Eds.), *Coupling of Thunderstorms and Lightning Discharges to Near-Earth Space* (pp. 21-27). New York: American Institute of Physics Conference Proceedings, **Vol.1118**.
- Huang, T.-Y. (2007). Investigations of wave-induced nonlinear response of minor species with the KBM averaging method. In A. Tsonis & J. Elsner (Eds.), *Nonlinear Dynamics in Geosciences* (pp. 153-166). New York: Springer.

Articles Published in Nonrefereed Journals

- Huang, T. -Y. & Hickey, M. P. (2009). Investigations of exothermic heating and OH nightglow variations induced by a gravity wave packet at 18 degree south, *Eos*, AGU, 90(52), Fall Meet. Suppl. Abstract SA53A-1243.
- Huang, T.-Y. & Kane, T. (2009). Assessing the validity of the approaches to extracting secular trends in number density due to global warming. *Eos Trans. AGU*, 90(22), Jt. Assem.Suppl., Abstract SA13B-03.
- Huang, T.-Y. (2008). Investigation of wave-induced variations of minor species in the MLT region at 18 S latitude. *John T. and Paige S. Smith Undergraduate Science Research Symposium Proceedings*, The Pennsylvania State University College, York.
- Huang, T.-Y., Chiang, C. Y., Kuo, C. L., Chen, A. B., Su, H. T. & Hsu, R. R. (2008). On the Lightning Induced Transient Emissions in the OH Airglow Layer Observed by ISUAL Instrument Onboard FORMOSAT-II Satellite, <http://taiyin.blogspot.com/2008/09/LITEs.html>.

- Huang, T.-Y., Chiang, C., Kuo, C., Nee, J., Chen, A. B., Su, H., et al. (2007). On the lightning induced transient emissions (LITEs) in the OH airglow region with ISUAL observations. *EOS Trans. AGU*, 88(52), Fall Meet. Suppl., AE23A-0901.
- Chiang, C., Chang, T., Huang, T.-Y., Wu, Y., Chen, A. B., Hsu, R., et al. (2007). Side-viewing observations of O(1D) and OH night airglow by ISUAL. *EOS Trans. AGU*, 88(52), Fall Meet. Suppl., SA13A-1084.
- Nee, J. B., Hsu, R., Chen, A. B., Su, H. T., Frey H., Mende, S., et al. (2007). OH and O(1D) airglow measurements at 630 nm from FORMOSAT 2 satellite. *EOS Trans. AGU*, 88(52), Fall Meet. Suppl., SA13A-1088.
- Huang, T.-Y., Nee, J. B., Chiang, C. Y., Chen, A. B., Kuo, C. L., Su, H. T., et al. (2007). On the mechanisms of the enhancement observed by ISUAL at the OH nightglow altitude. *Geophysical Research Abstracts*, Vol. 9, 08800.
- Huang, T.-Y., Nee, J. B., & Kuhl, R. (2006). On the simulations and observations of sprites-induced mesospheric OH nightglow emissions. *EOS Trans. AGU*, 87(52), Fall Meet. Suppl., AE51A-0268.
- Huang, T.-Y., Kuhl, R., & Troxell, S. (2006). An investigation of sprite-induced variations in the mesospheric OH nightglow emission. *John T. and Paige S. Smith Undergraduate Science Research Symposium Proceedings*, The Pennsylvania State University College, York.
- Huang, T.-Y. (2006). On the mesospheric OH nightglow emission in the occurrence of sprites, 2006 Western Pacific Geophysics Meeting. *Eos Trans. AGU*, 87(36), West. Pac. Geophys. Meet. Suppl., Abstract SA24C-0081.
- Huang, T.-Y., & Hickey, M. P. (2006). Investigations of wave-induced secular variations of OH nightglow emission and the intensity-weighted temperature in the MLT region. *The 36th International Conference COSPAR Meet. Suppl.*, Abstract C2.2-0077.
- Huang, T.-Y. (2006). Investigations of nonlinear response of minor species to gravity waves in the mesosphere with the application of the KBM averaging method. *Aegean Conferences Series*, Vol. 24, Abstract 9.
- Huang, T.-Y. (2005). Simulations of OH nightglow at sprite temperatures in the MLT region, *EOS Trans. AGU*, 86(18), Jt. Assem. Suppl., SA43A-06.
- Huang, T.-Y., & Hickey, M. P. (2003). On latitudinal dependence of secular variations induced by a dissipating gravity wave packet. *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract SA51A-0497.

- Huang, T.-Y., & Hickey, M. P. (2003). A comparative study of the observed airglow intensity with the full-wave model simulations. *Geophysical Research Abstracts*, V5, 12067, EAE03-A-12067.
- Hickey, M. P., & Huang, T.-Y. (2002). Simulations of MILs in the MLT region using a quasi-linear full-wave model. *2002 Western Pacific Geophysics Meeting*, SP42C-08.
- Huang, T.-Y., & Hickey, M. P. (2001). Simulations of MILs in the MLT region using a quasi-linear full-wave model. *Eos Trans. AGU*, 82(47), Fall Meet. Suppl., Abstract SA41B-0723.
- Huang, T.-Y., & Hickey, M. P. (2000). Secular variations of minor species and OH airglow in the mesopause region by transient gravity wave packets. *Eos Trans. AGU*, 81 (48), Fall Meet. Suppl., Abstract SA11A-23.
- Hickey, M. P., & Huang, T.-Y. (2000). Secular variations of chemical exothermic heating in the mesopause region induced by transient and dissipating gravity wave packets. *Eos Trans. AGU*, 81 (48), Fall Meet. Suppl., Abstract SA72A-10.
- Huang, T.-Y., Ward, W., & Shepherd, G. G. (1999). The local time behavior of green line volume emission rate around solstice conditions. *Eos Trans. AGU*, Spring Meet. Suppl., Abstract SA22A-02.
- Huang, T.-Y., Ward, W., & Shepherd, G. G. (1998). The local time behavior and latitudinal dependence of green line volume emission rate and derived oxygen mixing ratio around fall equinox 1995. *Eos Trans. AGU*, Fall Meet. Suppl., Abstract A12A-10.
- Huang, T.-Y., Li, X., Tuan, T. F., Dewan, E. M., & Picard, R. H. (1996). Effect of gravity wave-critical layer interactions on wind and temperature profiles. *International Conference COSPAR Meet. Suppl.*, Abstract C1.1-0078.
- Huang, T.-Y., & Tuan, T. F. (1995). Nonlinear spatial, temporal and integrated response of OH emission profiles due to linear gravity waves in the presence of winds. *IUGG Meet. Suppl.*, Abstract GAB31F-04.
- Huang, T.-Y., Tuan, T. F., & Picard, R. H. (1994). Nonlinear response of minor species and OH emission profile to a linear gravity wave with different propagation directions in the presence of winds. *Eos Trans. AGU*, Fall Meet. Suppl., Abstract SA51A-07.

Articles In In-house Publications

- Huang, T.-Y., & Sun, T. B. (2004-2009). *PHYS 211 Mechanics lab manual*.

- Huang, T.-Y., & Sun, T. B. (2004-2009). *PHYS 212 Electricity and magnetism lab manual.*
- Huang, T.-Y., & Sun, T. B. (2004-2009). *PHYS 213 Fluids and thermal physics lab manual.*
- Huang, T.-Y., & Sun, T. B. (2004-2009). *PHYS 214 Wave motion and quantum physics lab manual.*

Research Reports to Sponsor

- Report, submitted to NSF RUI program, award number ATM-0836920, “Gravity Wave Effects in the Mesosphere/Lower Thermosphere (MLT) Region with a 2-D, Nonlinear, Multiple-Airglow Chemistry-Dynamics Model,” December 2009.
- Final Report, submitted to NSF RUI program, award number ATM-0406585, “Investigations of wave-induced nonlinear response of chemically active species and associated airglow emissions in a shear flow,” July 2009.
- Report, submitted to NSF RUI program, award number ATM-0406585, “Investigations of wave-induced nonlinear response of chemically active species and associated airglow emissions in a shear flow,” May 2008.
- Report, submitted to NSF RUI program, award number ATM-0406585, “Investigations of wave-induced nonlinear response of chemically active species and associated airglow emissions in a shear flow,” May 2007.
- Report, submitted to NSF RUI program, award number ATM-0406585, “Investigations of wave-induced nonlinear response of chemically active species and associated airglow emissions in a shear flow,” June 2006.
- Report, submitted to NSF RUI program, award number ATM-0406585, “Investigations of wave-induced nonlinear response of chemically active species and associated airglow emissions in a shear flow,” June 2005.

Manuscripts Submitted for Publication

- Huang, T.-Y. and Kane, T. J. (2009). Assessing the Validity of Approaches for Extracting Secular Trends in Neutral Thermospheric Density, in preparation.
- Huang, T.-Y., Chiang, C. Y., Kuo, C. L., Chen, A. B., Su, H. T., & Hsu, R. R. (2009). ISUAL 630-nm Observations of LITEs in the OH airglow Layer, in preparation.
- Huang, T.-Y. (2009). On the validity of the steady-state assumptions for mesospheric airglow chemistry (in preparation).

PRESENTATIONS

2009

- Huang, T.-Y. (2009). Investigations of airglow intensity variations in the MLT region on different time scales, seminar, Institute of Space, Astrophysical and plasma Sciences, National Cheng Kung University, Tainan, Taiwan (**invited talk**).
- Huang, T.-Y. & Hickey, M. P. (2009). Investigations of exothermic heating and OH nightglow variations induced by a gravity wave packet at 18 degree south, AGU Fall meeting, San Francisco, California, USA.
- Huang, T.-Y. (2009). Lightning and Thunder, Linden Hall, Lititz, Pennsylvania, USA (**invited talk**).
- Huang, T.-Y. (2009). Airglow Intensity Variations in the MLT region: from Millisecond to Decadal Change, ISUAL 2009 Conference, National Cheng Kung University, Tainan, Taiwan (**invited talk**).
- Huang, T.-Y. (2009). Using airglow variations as a proxy for global climate change, Gravity Wave Workshop, Penn State University, University Park, Pennsylvania, USA (**invited talk**).
- Huang, T.-Y. & Kane, T. J. (2009). Assessing the validity of the approaches to extracting secular trends in number density due to global warming, 2009 Joint Assembly, The meeting of the Americas, Toronto, Canada.
- Huang, T.-Y., Chiang, C. Y., Kuo, C. L., Chen, A. B., Su, H. T, and Hsu, R. R. (2009). Observations of the Lightning-Induced Transient Emissions (LITEs) in the mesospheric airglow layers, Chapman Conference on Effects of Thunderstorms and Lightning in the Upper Atmosphere, Penn State University, University Park, Pennsylvania, USA.
- Anderson, P. and Huang, T.-Y. (2009). An assessment of the impact of gravity wave reflection on the wave-induced responses in the atmosphere, the 2009 Penn State Lehigh Valley Undergraduate Research and Scholarship Symposium, Penn State Lehigh Valley, Fogelsville, Pennsylvania, USA.
- Thacker-Dey, R. and Huang, T.-Y. (2009). Wave-induced Exothermic heating in the MLT region at latitude 18 degrees south, the 2009 Penn State Lehigh Valley Undergraduate Research and Scholarship Symposium, Penn State Lehigh Valley, Fogelsville, Pennsylvania, USA.

2008

- Huang, T.-Y. (2008). Investigation of wave-induced variations of minor species in the MLT region at 18 S latitude, John T. and Paige S. Smith Undergraduate Science Research Symposium, Penn State York, York, Pennsylvania, USA.
- Huang, T.-Y. (2008). Utilizing blogs as a platform to share your thoughts with the world, Penn State Physics Faculty Meeting, University Park, Pennsylvania, USA (**invited talk**).
- Nee, J. B. and Huang, T.-Y. (2008). Lightning produced transient airglow observed from FORMOSAT 2 satellite, 37th COSPAR Scientific Assembly, Montreal, Canada.
- Huang, T.-Y., Chiang, C. Y., Kuo, C. L., Nee, J. B., Chen, A. B., Su, H. T., et al. (2008). Investigations of lightning-induced sudden brightening in the OH airglow layer observed by ISUAL onboard FORMOSAT-II Satellite, Workshop on Coupling of Thunderstorms and Lightning Discharges to Near-Earth Space, University of Corsica, Corte, France.
- Dzienis, N. M., Huang, T.-Y., Hickey, M. P. (2008). Simulations of wave-induced variations of minor species and OH airglow in the MLT region at north and south 18 degree latitude, CEDAR workshop, Utah, USA.
- Dzienis, N. M., Huang, T.-Y., Hickey, M. P. (2008). Simulations of wave-induced variations of minor species in the MLT region at north and south 18 degree latitude, The 2008 Penn State Lehigh Valley Undergraduate Research and Scholarship Symposium, Fogelsville, Pennsylvania, USA.
- Huang, T.-Y. (2008). Lightning and Thunderstorms, Country Meadows Retirement Home Community, Allentown, Pennsylvania, USA (**invited talk**).

2007

- Nee, J. B., Hsu, R. R., Chen, A. B., Su, H. T., Frey, H., Mende, S., et al. (2007). OH and O(1D) airglow measurements at 630 nm from FORMOSAT 2 satellite, AGU Fall Meeting, San Francisco, California, USA.
- Chiang, C. Y., Chang, T. F., Huang, T.-Y., Wu, Y. S., Chen, A. B., Su, H. T., et al. (2007). Side-viewing Observations of O(1D) and OH night airglows by ISUAL, AGU Fall Meeting, San Francisco, California, USA.
- Huang, T.-Y., Chiang, C. Y., Kuo, C. L., Nee, J. B., Chen, A. B., Su, H. T., et al. (2007). On the lightning induced transient emissions (LITEs) in the OH airglow region with ISUAL observations, AGU Fall Meeting, San Francisco, California, USA.

- Huang, T.-Y. (2007), Wave-induced secular variations of minor species and OH intensity in the MLT region, Center of Space Science and Applied Research, Chinese Academy of Sciences, Beijing, China (**invited talk**).
- Huang, T.-Y., Chiang, C. Y., Kuo, C. L., Nee, J. B., Chen, A. B., Su, H. T., et al. (2007). On the mechanisms of the lightning-induced sudden brightness at the OH airglow altitude, Center of Space Science and Applied Research, Chinese Academy of Sciences, Beijing, China (**invited talk**).
- Huang, T.-Y., Chiang, C. Y., Kuo, C. L., Nee, J. B., Chen, A. B., Su, H. T., et al. (2007). The Lightning associated sudden brightness at the OH airglow altitude: Are they optical emissions of N₂ 1P or OH?? , CEDAR meeting, Santa Fe, New Mexico, USA.
- Nee, J. B., Huang, T.-Y., Hsu, R. R., Chen, A. B., Su, H. T., Frey, H. U. Frey, et al. (2007). Equatorial OH airglow observed by FORMOSAT 2 satellite, Taiwan Geosciences Assembly, Longtan, Taiwan.
- Huang, T.-Y., Chiang, C. Y., Kuo, C. L., Nee, J. B., Su, H. T., & Hsu, R. R. (2007). Investigations of the observed lightning induced OH enhancements at the OH airglow altitude during the ISUAL January 2007 campaign, Taiwan Geosciences Assembly, Longtan, Taiwan (**invited talk**).
- Huang, T.-Y., Chiang, C. Y., Kuo, C. L., Nee, J. B., Su, H. T., & Hsu, R. R. (2007). Investigations of the observed lightning induced OH enhancements at the OH airglow altitude during the ISUAL January 2007 campaign, National Cheng Kung University, Tainan, Taiwan (**invited talk**).
- Huang, T.-Y., Nee, J. B., Chiang, C. Y., Chen, A. B., Kuo, C. L., Su, H. T., et al. (2007). On the mechanisms of the enhancement observed by ISUAL at the OH nightglow altitude, EGU General Assembly, Vienna, Austria.
- Crosby, N., & Huang, T.-Y. (2007). 2008 TLEs workshop announcement, EGU General Assembly, Vienna, Austria.

2006

- Huang, T.-Y. (2006). On the characteristics and the wave-induced variations of mesospheric airglows, The Plasma and Space Center of Cheng Kung University, Tainan, Taiwan (**invited talk**).
- Huang, T.-Y., & Nee, J. B. (2006). On the Simulations and Observations of Sprites-induced Mesospheric OH Nightglow Emissions, AGU Fall Meeting, San Francisco, California, USA.

- Huang, T.-Y., Kuhl, R., & Troxell, S. (2006). An investigation of sprite-induced variations in the Mesospheric OH Nightglow Emission, John T. and Paige S. Smith Undergraduate Science Research Symposium, York, Pennsylvania, USA (**invited talk**).
- Huang, T.-Y. (2006). On the mesospheric OH nightglow emission in the occurrence of sprites, Western Pacific Geophysics Meeting, Beijing, China.
- Huang, T.-Y., & Hickey, M. P. (2006). Investigations of wave-induced secular variations of OH nightglow emission and the intensity-weighted temperature in the MLT region, The 36th COSPAR Scientific Assembly, Beijing, China.
- Huang, T.-Y. (2006). Can OH nightglow emission be a thermometer of sprites?, CEDAR meeting, Santa Fe, California, USA.
- Huang, T.-Y., & Troxell, S. (2006). On the OH nightglow emission in the occurrence of sprites, CEDAR meeting, Santa Fe, California, USA.
- Huang, T.-Y. (2006). Investigation of nonlinear response of minor species to gravity waves in the mesosphere with the application of the KBM averaging method, 20 Years of Nonlinear Dynamics in Geosciences sponsored by Aegean Conferences, Rhodes, Greece.

2005

- Huang, T.-Y. (2005). Investigation of temperature dependence of OH nightglow emission in the mesopause region during sprite events, National Cheng Kung University, Tainan, Taiwan (**invited talk**).
- Huang, T.-Y. (2005). Investigation of temperature dependence of OH nightglow emission in the mesopause region during sprite events, The International Space Weather Conference, Macau, China.
- Huang, T.-Y. (2005). Simulations of OH nightglow at sprite temperatures in the MLT region, AGU Spring meeting, New Orleans, Louisiana, USA.
- Fritz, J., & Huang, T.-Y. (2005). On the OH nightglow emission at Sprite temperatures in the MLT region, CEDAR meeting, Santa Fe, California, USA.
- Hoang, T., & Huang, T.-Y. (2005). The secular variations of OH nightglow emission induced by gravity wave forcing, CEDAR meeting, Santa Fe, California, USA.
- Abdo, K., & Huang, T.-Y. (2005). The wave-induced non-periodic response of minor species in the MLT region, CEDAR meeting, Santa Fe, California, USA.

- Hanner, B., & Huang, T.-Y. (2005). Investigation of the temperature inversion layer observed in the MLT region during the ALOHA-93 campaign, CEDAR meeting, Santa Fe, California, USA.

2004

- Huang, T.-Y., & Hickey, M. P. (2004). The formation of MILs in the MLT region triggered by gravity wave forcing, 2nd IAGA/ICMA workshop, Bath, United Kingdom.
- Huang, T.-Y. (2004). When Lighting Strikes: On The Effects of Electrical Discharges in the Atmosphere, 2004 Lehigh Valley Brown Bag Seminar Series, Lehigh Valley Campus, Pennsylvania State University, Fogelsville, Pennsylvania, USA.

2003

- Huang, T.-Y., & Hickey, M. P. (2003). Latitudinal dependence of secular variations induced by a dissipating wave packet, AGU Fall Meeting, San Francisco, California, USA.
- Huang, T.-Y., & Hickey, M. P. (2003). A comparative study of the observed airglow intensity with the full-wave model simulations, EGS-AGU-EUG Joint Assembly, Nice, France.

2002

- Huang, T.-Y. (2002). Gravity wave studies in the mesospheric region, CEDAR NSF Postdoctoral Report, Longmont, Colorado, USA.
- Hickey, M. P., & Huang, T.-Y. (2002). Simulations of MILs in the MLT region using a quasi-linear full-wave model, Western Pacific Geophysics Meeting, Wellington, New Zealand.

2001

- Huang, T.-Y., & Hickey, M. P. (2001). Simulations of MILs in the MLT region using a quasi-linear full-wave model, AGU Fall Meeting, San Francisco, California, USA.

2000

- Huang, T.-Y., & Hickey, M. P. (2000). Secular variations of minor species and OH airglow in the mesopause region by transient gravity wave packets, AGU Fall Meeting, San Francisco, California, USA.

- Huang, T.-Y. (2000). Analytic modeling of ducting and relation to ALOHA observations, CEDAR-Wave ducting workshop, Boulder, Colorado, USA.
- Huang, T.-Y., Hickey, M. P., & Stanhope, S. (2000). Investigation of gravity waves using Starfire data, CEDAR Workshop, Boulder, Colorado, USA.
- Hickey, M. P., & Huang, T.-Y. (2000). Secular variations of chemical exothermic heating in the mesopause region induced by transient and dissipating gravity wave packets, AGU Fall Meeting, San Francisco, California, USA.

1999

- Huang, T.-Y. (1999). Waves in the upper atmosphere: The models and the observations, Physics Seminar, Department of Physics and Astronomy, Clemson University, Clemson, South Carolina, USA (**invited talk**).
- Huang, T.-Y., Ward, W. E., & Shepherd, G. G. (1999). The local time behavior of green line volume emission rate around solstice conditions, AGU Spring Meeting, Boston, Massachusetts, USA.
- Huang, T.-Y. (1999). Waves in the upper atmosphere: the models and the observations, Physics Graduate Student Union, Physics Department, University of Cincinnati, Cincinnati, Ohio, USA (**invited talk**).
- Huang, T.-Y., Ward, W. E., & Shepherd, G. G. (1999). The local time behaviour of oxygen mixing ratio, Physics Seminar, York University, Toronto, Canada (**invited talk**).

1998

- Huang, T.-Y., & Tuan, T. F. (1998). The modeling of the nonlinear temporal and spatial response of minor species to a linear gravity wave in the presence of winds, Physics Seminar, York University, Toronto, Canada (**invited talk**).
- Huang, T.-Y., Ward, W. E., & Shepherd, G. G. (1998). The local time behavior and latitudinal dependence of green line volume emission rate and derived oxygen mixing ratio around fall equinox 1995, AGU Fall Meeting, San Francisco, California, USA.
- Huang, T.-Y., & Tuan, T. F. (1998). Modeling the temperature-inversion-layer-formation observed in ALOHA-93 as a critical-layer-interaction phenomenon, Physics Seminar, University of Michigan, Ann Arbor, Michigan, USA (**invited talk**).

- Huang, T.-Y., Ward, W. E., & Shepherd, G. G. (1998). Local time behaviour of $O(^1S)$ nightglow and derived oxygen mixing ratio at equinox, CEDAR workshop, Boulder, Colorado, USA.

1997

- Huang, T.-Y., & Tuan, T. F. (1997). Sudden narrow temperature inversion-layer formation in ALOHA-93 as a critical-layer-interaction phenomenon, Seminar, Colorado Research Association, Boulder, Colorado, USA (**invited talk**).
- Huang, T.-Y. (1997). Internal gravity waves generated by the shear instability of a model tropospheric jet stream, Physics Department, University of Cincinnati, Cincinnati, Ohio, USA.

1996

- Huang, T.-Y., & Tuan, T. F. (1996). Effect of gravity wave-critical layer interactions on wind and temperature profiles, International Conference, COSPAR, Birmingham, United Kingdom.

1995

- Huang, T.-Y., & Tuan, T. F. (1995). Observation of a critical layer through the behavior of temperature profiles, International Conference, IUGG, Boulder, Colorado, USA.
- Huang, T.-Y., & Tuan, T. F. (1995). Nonlinear spatial, temporal and integrated response of OH emission due to linear Gravity Waves in the presence of winds, International Conference, IUGG, Boulder, Colorado, USA.

1994

- Huang, T.-Y., & Tuan, T. F. (1994). Nonlinear response of minor species and OH emission profile to a linear Gravity wave with different propagation directions in the presence of winds, AGU Fall Meeting, San Francisco, California, USA.
- Huang, T.-Y., Li, K., Tuan, T. F., & Taylor, M. J. (1994). Directional filtering of gravity wave propagation seen from time dependent blocking diagrams, AGU Fall Meeting, San Francisco, California, USA.
- Huang, T.-Y., Tuan, T. F., & Picard, R. H. (1994). Nonlinear Response of Minor Species to a linear Gravity Wave in the presence of winds, AGU Spring Meeting, Baltimore, Maryland, USA.

RESEARCH WITH UNDERGRADUATE STUDENTS

Supervision of Undergraduate Projects

- Robert Thacker-Dey, Honors Option- Physics 212, Fall 2008.
Project: “Physics of magnetic propulsion of space vehicles”
- Foram Dave, Honors Option- Physics 212, Fall 2008.
Project: “Using electromagnetic devices to assist heart as a pump”
- Pratik Patel, Honors Option- Physics 212, Fall 2008.
Project: “The working of a heart from the electromagnetic perspective”
- Mallory Zingone, Honors Option- Physics 214, Spring 2008.
Project: “The Influence of waves on Human: EM Waves”

Results were presented at the 2008 Penn State Lehigh Valley Undergraduate Research and Scholarship Symposium in April, 2008.

- Nicholas Dzienis, Honors Option- Physics 214, Spring 2008.
Project: “From Ultraviolet Catastrophe to Quantum Mechanism”
*Honors credit withdrawn
- Mallory Zingone, Honors Option- Physics 213, Spring 2008.
Project: “The Influence of waves on Human: Sound Waves”
- Nicholas Dzienis, Honors Option- Physics 213, Spring 2008.
Project: “From Ultraviolet Catastrophe to Quantum Mechanism”
*Honors credit withdrawn
- Nadia Abidi, Honors Option-Physics 212, Fall 2007.
Project: “The Global Electric Circuit”
- Jason Hinkle, Honors Option-Physics 212, Fall 2007.
Project: “The Global Electric Circuit”
- Didier Greenleaf, Honors Option-Physics 212, Fall 2007.
Project: “The Phenomena Associated with Lightning Discharge”
- Jestin Abraham, Honors Option-Physics 214, Spring 2007.
Project: “Waveguides in the atmosphere”
- Jestin Abraham, Honors Option-Physics 213, Spring 2007.
Project: “Modern Engines”
- Jestin Abraham, Honors Option-Physics 212, Fall 2006.
Project: “Cold Fusion”

- Christophe Albright, Honors Option-Physics 212, Fall 2006.
Project: “Building a Faraday Cage in the Lab”

The project was demonstrated on youtube:
<http://www.youtube.com/watch?v=5YkYQKKZg6o>
- Steven Troxell, Honors Option-Physics 213, Spring 2006.
Project: “On the Distribution of Molecular Speeds Using Maxwell’s Speed Distribution Law”
- Steven Troxell, Honors Option-Physics 212, Fall 2005.
Project: “On Charge Distribution and the Electric Field in Thunderclouds”
- Steven Troxell, Honors Option-Physics 211, Spring 2005.
Project 1: “Numerical Simulation of Lorenz Attractor”
Project 2: “Projectile in a Realistic Atmosphere”
- Jeffery Amate, Honors Option-Physics 214, Spring 2004.
Project 1: “Light and Color”
Project 2: “Lasers”

Supervision of Undergraduate Research

- Robert Thacker-Dey, Undergraduate Research Assistant, Spring 2009 – Summer 2009
Project: “Exothermic Heating in the MLT Region at Latitude 18 Degree South”

Results were presented at the 2009 Penn State Lehigh Valley Undergraduate Research and Scholarship Symposium.
- Phillip Anderson, Undergraduate Research Assistant, Spring 2009
Project: “The impact of reflection on the wave-induced nonlinear Response derived from the KBM Averaging Method”

Results were presented at the 2009 Penn State Lehigh Valley Undergraduate Research and Scholarship Symposium.
- Nicholas Dzienis, Undergraduate Research Assistant, Spring 2008 – summer 2008
Project: “Investigations of Wave-induced Secular Variation of OH airglow in the Southern Hemisphere”

Results were presented at the 2008 Penn State Lehigh Valley Undergraduate Research and Scholarship Symposium in April 2008, and Nicholas received the Symposium Award. He also presented the results at 2008 CEDAR workshop.
- Nicholas Dzienis, Undergraduate Research Assistant, Spring 2007 – fall 2007

Project: “Investigations of Lightning-induced OH Emissions with ISUAL’s Observational Data”

- Roger Kuhl, Undergraduate Research Assistant, Summer 2006 – Fall 2006
Project: “The Effects of Sprites on the OH Emission”

Results were presented at John T. and Paige S. Smith Undergraduate Science Research Symposium in 2006 and published in the conference proceedings.

- Bonnie Hanner, Undergraduate Research Assistant, Summer 2006
Project: “The Effects of Sprites on the O(¹S) Emission”
- Steven Troxell, Undergraduate Research Assistant, Summer 2005 – Spring 2006
Project 1: “The Effects of Sprites on the OH Emission”
Project 2: “On Thunderclouds’ Role as Giant Batteries in Global Circuits”

Results were presented in the Coupling, Energetics and Dynamics of Atmospheric Regions (CEDAR) meeting in Santa Fe in 2006. Some of the results were published in the PSU Undergraduate Research Symposium proceedings.

- Delford Hesener, Undergraduate Research Assistant, Summer 2005 – Fall 2005
Project 1: “Investigation of Thunderstorms Utilizing Satellite Imaging and Observations”
Project 2: “Investigation of the Temperature Inversion Layer Observed in the MLT Region During the ALOHA-93 Campaign”
- Bonnie Hanner, Undergraduate Research Assistant, Summer 2005
Project: “Investigation of the Temperature Inversion Layer Observed in the MLT Region During the ALOHA-93 Campaign”

Results were presented in the Coupling, Energetics and Dynamics of Atmospheric Regions (CEDAR) meeting in Santa Fe in 2005.

- Jason Fritz, Undergraduate Research Assistant, Fall 2004- Summer 2005
Project: “On the OH nightglow emission at Sprite temperatures in the MLT region”
Mini-Project: “Thunderstorms”

Results were presented in the Coupling, Energetics and Dynamics of Atmospheric Regions (CEDAR) meeting in Santa Fe in 2005.

- Thien Hoang, Undergraduate Research Assistant, Fall 2004- Summer 2005
Project: “The secular variations of OH nightglow emission induced by gravity wave forcing”
Mini-Project: “Lightning”

Results were presented in the Coupling, Energetics and Dynamics of Atmospheric Regions (CEDAR) meeting in Santa Fe in 2005.

- Kevin Abdo, Undergraduate Research Assistant, Fall 2004- Summer 2005
Project: “The wave-induced non-periodic response of minor species in the MLT region”
Mini-Project: “Sprites, blue jets and elves”

Results were presented in the Coupling, Energetics and Dynamics of Atmospheric Regions (CEDAR) meeting in Santa Fe in 2005.

Supervision of Graduate Research

- Pengyu Huang, Graduate Research Assistant, Fall 2009- , National Cheng Kung University, co-mentoring with Dr. Alfred Cheng.
Project: “On the LITEs in the O₂(0,0) airglow layer”

PROFESSIONAL EXPERIENCE

09/09- 08/10	National Cheng Kung University, Physics Department, Visiting Professor of National Science Council of Taiwan
07/09- 07/09	The Pennsylvania State University – University Park, Electrical Engineering Department and Meteorology Department, Visiting Scholar
07/08- present	The Pennsylvania State University, Associate Professor
07/02- 06/08	The Pennsylvania State University, Assistant Professor
11/99- 06/02	Clemson University, Research Associate
7/99-11/99	University of Cincinnati, Visiting Scientist
10/97-6/99	York University, Canada, Postdoc Fellow
01/96-09/97	University of Cincinnati, Research Assistant
09/95-06/96	University of Cincinnati, Vice president of the Graduate Student Association
09/91-12/95	University of Cincinnati, Teaching Assistant
09/90-06/91	Fengchia University, Teaching Assistant

TEACHING

“Fundamentals of Physics - Mechanics,” Penn State University Lehigh Valley, Emerging Engineering Professionals Program, 2009.

“Introduction to Lightning,” Penn State University Lehigh Valley, 2008-2009.

“Fundamentals of Physics,” Penn State University Lehigh Valley, 2005-present.

“Fundamentals of Physics,” Penn State University Berks and Lehigh Valley College, 2002-2005.

“Physics of weather,” Clemson University, 2002, taught one class for Prof. Hickey

“Quantum Mechanics,” Clemson University, 2001, taught one class for Prof. Hickey

Physics Recitations and Labs, Astronomy Labs, University of Cincinnati, 1991-1995

Physics Labs, Fengchia University, 1900-1991

CONSULTING

2009

- Consultant for Alpha Photonitek Corporation, 2008 – present.
- Reviewer for Journal of Geophysical Research – Space Physics, 2009.
- External Examiner of a Ph. D. thesis for York University, Canada, 2009.
- President, Lehigh Valley Taiwanese Women Association, 2009.
- Reviewer for “SUN and GEOSPHERE: The International Journal of Research and Applications,” 2009.

2008

- Consultant for Alpha Photonitek Corporation, 2008.
- Proposal reviewer for National Science Foundation, 2008.
- Reviewer for Geophysical Research Letters, 2008.
- Advanced Placement Reader, the College Board AP Physics Reading, 2008.
- Reviewer for Terrestrial, Atmospheric and Oceanic Sciences Journal, 2008.

2007

- Reviewer for Geophysical Research Letters, 2007.
- Reviewer for Terrestrial, Atmospheric and Oceanic Sciences Journal, 2007.

- Review panelist for the NSF Coupling, Energetics, and Dynamics of Atmospheric Regions (CEDAR) program to review the proposals submitted for the 2008 competition.
- Project Consultant for iLED Photoelectronics, Inc., 2007.

2006

- Reviewer for Terrestrial, Atmospheric and Oceanic Sciences Journal, 2006.
- Review panelist for the NSF Coupling, Energetics, and Dynamics of Atmospheric Regions (CEDAR) program to review the proposals submitted for the 2007 competition.
- Project Consultant for iLED Photoelectronics, Inc., 2006.

2004

- Reviewer for Journal of Lightwave Technology, 2004.

2003

- Reviewer for Journal of Atmospheric and Solar-Terrestrial Physics, 2003.

2002

- Reviewer for Journal of Geophysical Research, 2002.

FUNDED PROJECTS AND GRANTS

Completed Projects

- Principal Investigator. 2004-2009. Project: “Investigations of wave-induced nonlinear response of chemically active species and associated airglow emissions in a shear flow.” National Science Foundation RUI (\$ 115,938).
- Principal Investigator. 2007-2008. Project: “Investigations of wave-induced nonlinear response of chemically active species and associated airglow emissions in a shear flow.” National Science Foundation RUI Supplement (\$ 22,887).
- Principal Investigator. 2008-2009. Project: “Investigations of wave-induced nonlinear response of chemically active species and associated airglow emissions in a shear flow.” National Science Foundation RUI Supplement (\$ 19,610).
- Principal Investigator. Summer 2008. Project: “To attend the Lightning Workshop in Corsica,” Penn State Eberly College of Science Professional Development Funds (\$500).

- Principal Investigator. Spring 2007. Project: “To attend CEDAR meeting,” Penn State Eberly College of Science Professional Development Funds (\$500).
- Principal Investigator. Fall 2005. Project: “To adopt ANGEL in course curricula,” Basic Educational Technology Fund (BET)
- Principal Investigator. Fall 2005. Project: “To attend The International Space Weather Conference in Macau, China,” The International Space Weather Conference Travel Grant (\$500).
- Principal Investigator. Fall 2005. Project: “To attend The International Space Weather Conference in Macau, China,” Penn State Eberly College of Science Professional Development Funds (\$500).
- Principal Investigator. Spring 2005. Project: “Computational Atmospheric Physics,” Penn State’s President’s Fund for Research (\$900).
- Principal Investigator. 2004-2005. Project: “Computational Atmospheric Physics,” Penn State University Research and Development Grant (\$2,000).
- Principal Investigator. 2004-2005. Project: “Science Lecture Series,” Penn State University Student Activity Funds (\$2,100).
- Principal Investigator. Summer 2004. Project: “To attend 2nd IAGA/ICMA workshop to present a paper,” Penn State Eberly College of Science Professional Development Funds (\$500).
- Principal Investigator. Summer 2004. Project: “To attend NATO Advanced Study Institute on Sprites, Elves and Intense Lightning Discharges,” Penn State Berks and Lehigh Valley College Faculty Development Funds (\$500).
- Principal Investigator. Summer 2004. Project: “To attend NATO Advanced Study Institute on Sprites, Elves and Intense Lightning Discharges,” Penn State Berks and Lehigh Valley College International Funds (\$400).
- Principal Investigator. Summer 2004. Project: “To attend NSF Chautauqua Short Courses for College Teachers: Engaging Students in Learning Science and Mathematics-The Process Workshop Classroom,” Penn State Berks and Lehigh Valley College Faculty Development Funds (\$500).
- Principal Investigator. Fall 2003. Project: “Physics Demonstrations,” Penn State Berks and Lehigh Valley College (\$1,000).
- Principal Investigator. Fall 2003. Project: “The OH airglow study at mid-latitudes in the presence of a gravity wave packet,” Penn State University Research and Development Grant (\$2,000).

- Principal Investigator. Fall 2002. Project: “Secular variations of OH at mid-latitudes,” Penn State University Research and Development Grant (\$2,500).
- Co-Principal Investigator. Fall 2001. Project: “A numerical study on time-dependent effects of ducting,” NSF CEDAR Postdoctoral award (\$ 100,000).

In Progress

- Principal Investigator. 2009 Summer. Project: “An Investigation of gravity-wave induced airglow variations in the upper atmosphere as a proxy for global climate change” The Pennsylvania State University Research Collaboration Fellowship (\$10,000).
- Principal Investigator. 2009 - 2011. Project: “RUI: Gravity Wave Effects in the Mesosphere/Lower Thermosphere (MLT) Region with a 2-D, Nonlinear, Multiple-Airglow Chemistry-Dynamics Model” National Science Foundation RUI (\$ 183,868).

SERVICE

Service to the University

Service to the Campus

- Organizer, “The 2009 Penn State Lehigh Valley Undergraduate Research and Scholarship Symposium,” Penn State Lehigh Valley, Fogelsville, USA, 2009.
- Organizer, “The 2008 Penn State Lehigh Valley Undergraduate Research and Scholarship Symposium,” Penn State Lehigh Valley, Fogelsville, USA, 2008.
- Member, Engineering Faculty Search Committee, 2007-2008.
- Chair, Research and Scholarship Committee, 2007-2009.
- Member, Penn State Lehigh Valley Faculty Invitational Lecture Series Committee, Spring 2007.
- Chair, Organizer, and Founder, Penn State Lehigh Valley Faculty Invitational Lecture Series Committee, 2005-2006.
- Chair and Founder, Lehigh Valley Science Lecture Series Committee, 2004-2005.

Service to Berks and Lehigh Valley College

- Member, Science Division Curriculum/Assessment/Strategic Planning, 2004-2005.

- Member, College Faculty Senate Strategic Planning and Budget Committee, 2004-2005.
- Member, Science Division General Science Subcommittee, 2004-2005.
- Member, Physics Technician Search Committee, Spring 2003.
- Member, General Science program Subcommittee, Fall 2003.
- Member, Physics Faculty Search Committee, Fall 2002.

Participation in campus and/or University-wide governance bodies and related activities

- Member, Penn State Lehigh Valley Faculty Affairs Committee, 2005-present.
- Senator, Penn State Lehigh Valley Faculty Senate, 2005-present.

Other

- Service to Physics Department at the Lehigh Valley campus: Supervise physics labs at the Lehigh Valley campus, maintaining and repairing lab equipment, conducting routine tests of equipment and software. Organize the physics stock room, inventorying the equipment, ordering supplies and keeping records of purchases, assisting in estimates of the yearly departmental budgets at the Lehigh Valley campus. Assisted Director of Academic Affairs in hiring part-time physics faculty; mentored part-time physics faculty.
- Chair, Penn State Lehigh Valley Physics Excellence Award Committee, 2005-2008.
- Participant, Lehigh Valley Open House, Spring 2004.

Service to Society as a Representative of the University

Participation in Community Affairs

- Panelist, “Race, Ethnicity, and Migration: The Politics of Everyday Experience,” The Penn State Lehigh Valley Diversity Committee and the OLEAD Association, Lehigh Valley, April, 2009.
- Participant, “Symposium on Innovations in Teaching and Learning,” Penn State Lehigh Valley, April, 2009.
- Invited panelist, “Panel Discussion on Global Warming,” The Penn State Lehigh Valley Honors Program, Lehigh Valley, April, 2007.

- Participant, “Technology Roundtable- Harnessing the Power of Social Computing in the Classroom,” Schreyer Teaching Luncheon series, Lehigh Valley, April 2007.
- Participant, “Penn State Students Reflect on their Best Learning Experiences,” Schreyer Teaching Luncheon series, Lehigh Valley, February 2007.
- Judge, National History Day District Competition, Lehigh Valley campus, March 2006.
- Judge, National History Day District Competition, Lehigh Valley campus, March 2005.
- Participant, “Strengths, Weaknesses, Opportunities, and Threats” Open discussion forum, Lehigh Valley campus, August 2004.
- Participant, “Outreach Scholarship Forum,” the Corporate Learning Center, Berks and Lehigh Valley College, Spring 2004.
- Participant, “Writing in the disciplines: assignments and assessment” Workshop, Berks and Lehigh Valley College, Fall 2003.
- Participant, “Science Today and Tomorrow” Workshop, Berks, Summer 2003.
- Participant, “Facilitating student learning” Seminars, Lehigh Valley, Spring 2003.

Service to governmental agencies at the international, Federal, state, and local levels

- Participant, AGU/Copenhagen Media Outreach project, San Francisco, USA, 2009.
- Proposal reviewer for National Science Foundation, 2008.
- Invited review panelist for the NSF Coupling, Energetics, and Dynamics of Atmospheric Regions (CEDAR) program to review the proposals submitted for the 2008 competition.
- Invited review panelist for the NSF Coupling, Energetics, and Dynamics of Atmospheric Regions (CEDAR) program to review the proposals submitted for the 2007 competition.

Service to business and industry

- Assisted a World Journal news reporter in interviewing PA Congressman, Charlie Dent, 2007.

Service to Public and Private Organizations

- President, Lehigh Valley Taiwanese Women Association, 2009.
- Presenter, “Computer Literacy Series – How to use Excel “, April, 2009.
- Presenter, “Computer Literacy Series –How to use Facebook”, March, 2009.
- Presenter, “Computer Literacy Series – How to use email”, February, 2009.
- Assisted a faculty of Northern Kentucky University in translating key words used in astronomy to Chinese for a new bi-lingual planetarium show for the planetarium of Northern Kentucky University, Fall 2006.
- Invited Panelist, “Adversity or Opportunity: Women’s Global Views” Panel, The Women’s Center and the Center for Lifelong Learning & Professional Development, Kutztown University, Spring 2004.

Other

- Participant, “Engaging Students in Learning Science and Mathematics-The Process Workshop Classroom,” NSF Chautauqua Short Courses for College Teachers, Stony Brook University, Summer 2004.

Service to the Disciplines and to the Profession

Organizing conferences, service on conference committees

- Co-Editor, “Coupling of Thunderstorms and Lightning Discharges to Near-Earth Space,” New York: American Institute of Physics Conference Proceedings, 2008-2009.
- Chair of Opening Lecture Session, “Workshop on Coupling of Thunderstorms and Lightning Discharges to Near-Earth Space,” international workshop, University of Corsica, Corte, France, 2008.
- Member of Scientific Organizing Committee, “Workshop on Coupling of Thunderstorms and Lightning Discharges to Near-Earth Space,” international workshop, University of Corsica, Corte, France, 2008.
- Member of Local Organizing Committee, “Workshop on Coupling of Thunderstorms and Lightning Discharges to Near-Earth Space,” international workshop, University of Corsica, Corte, France, 2008.

- Co-organizer, “Workshop on Coupling of Thunderstorms and Lightning Discharges to Near-Earth Space,” international workshop, University of Corsica, Corte, France, 2007-2008.
- Convener, “Short-period Gravity Waves and Their Effects in the MLT Region,” CEDAR workshop, Santa Fe, USA, 2007.
- Chair for C2.2 poster session, “Tides, Waves, and Coupling Processes from Troposphere to Ionosphere,” The 36th COSPAR Scientific Assembly, Beijing, China, 2006.
- Assisted in organizing a workshop, “Sprites, Elves and Intense Lightning Discharges,” NATO Advanced Study Institute, Corte, Corsica, July 2004.

PROFESSIONAL MEMBERSHIPS

Associate member, Committee on Space Research, COSPAR (2006-present)
Member, European Geosciences Union, EGU (2003–present)
Member, American Geophysical Union, AGU (1994–present)
Member, American Physical Society, APS (1991–present)

HONORS AND AWARDS

The Pennsylvania State University Research Collaboration Fellowship, 2009
Marquis Who’s Who in the World, 2009
Marquis Who’s Who in America, 2009
Marquis Who’s Who of American Women, 2008-2009
Marquis Who’s Who in Science and Engineering, 2008-2009
CEDAR Postdoctoral Award, NSF, 2001-2002
International Postdoctoral Fellowship, CRESS, Canada, 1997-1999
Dr. Sun Yat-Sen Thesis Award, Taiwan, 1986