

Xinlin Li

Title: Professor

Citizenship: USA

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Education:

1986—1992, Dartmouth College, New Hampshire, Ph.D. in Physics. Thesis topic: *Ring Current Oxygen Ion Interaction with Micropulsations*, (Mary K. Hudson)

1982—1985, Shanghai Institute of Optics and Fine Mechanics, Academia Sinica, M.S. in Physics. Thesis topic: *Interaction of Intense Laser Light with Plasmas*, (Zhizhan Xu)

1978—1982, University of Science and Technology of China, B.S. in Physics

Professional Societies:

American Geophysical Union

Asian and Oceanic Geophysical Society

Employment:

2011—Present, Dept. of Aerospace Engineering Sciences and Laboratory for Atmospheric and Space Physics, University of Colorado at Boulder, Professor.

2009—2011, Dept. of Aerospace Engineering Sciences and Laboratory for Atmospheric and Space Physics, University of Colorado at Boulder, Associate Professor (with tenure).

2002—2009, Dept. of Aerospace Engineering Sciences and Laboratory for Atmospheric and Space Physics, University of Colorado at Boulder, Associate Professor (without tenure).

2000—2002, Dept. of Aerospace Engineering Sciences and Laboratory for Atmospheric and Space Physics, University of Colorado at Boulder, Associate Research Professor.

1995—2000, Laboratory for Atmospheric and Space Physics, University of Colorado at Boulder, Research Associate.

1993—1995, Dartmouth College, Research Associate.

1992—1993, Dartmouth College, Postdoctoral Research Associate.

1989—1991, Dartmouth College, Research Assistant.

1987—Summer, Space Sciences Laboratory at UC Berkeley, visiting graduate student.

1986—1989, Dartmouth College, Teaching Assistant.

1985—1986, Shanghai University of Science and Technology, Lecturer.

1983—1985, Shanghai Institute of Optics and Fine Mechanics, Research Assistant.

Experiences and Responsibilities:

As a professor of aerospace engineering sciences, Professor Li supervises and supports a number of graduate students as well as professional research associates and assistants. His principal research interests are studies of solar wind energy coupling into Earth's magnetosphere and of energetic particle dynamics in the

magnetosphere. His early contribution to the successful simulation and explanation of the prompt formation of new radiation belts associated with a strong interplanetary shock on March 24, 1991 caused a major change in our understanding of particle transport in the radiation belt. Furthermore he and his collaborators made the first direct comparison of long-term and continuous measurements of energetic electrons in the solar wind and in the magnetosphere, concluding that the energetic electrons in the solar wind cannot directly supply the MeV electrons observed at geosynchronous orbit and that additional internal acceleration processes are required within the magnetosphere to produce the outer radiation belt. His current research includes analysis and interpretation of particle and field data from satellites and ground stations, energetic particle instrument development, modeling and simulation of energetic particle transport associated with magnetic storms and substorms, and prediction and real-time forecast of MeV electrons and the Dst index. His teaching activities include aerospace environment, space dynamics, thermodynamics, and space-flight hardware design. Recently, he was awarded a CubeSat project from NSF and has been leading a group of graduate students as they design, build, calibrate, and test the CubeSat system, which is to be delivered by the end of 2011 and ready for launch in 2012 to measure energetic particles in space.

Awards:

1. NASA Group Achievement Award in recognition of outstanding contribution to the THEMIS mission, 2008.
2. Outstanding Young (45 or younger) Oversea Scientist Award from Chinese National Science Foundation (no more than one recipient in space physics is selected per year), 2007.
3. NASA/THEMIS Project Recognition acknowledging for outstanding contributions to the Science Support, Specially Instrument Definition and Mission Design to Address Radiation Belt Physics, 2006.
4. The European Space Agency Award in recognition of outstanding contribution made to Cluster's exploration of Geospace, 2006.
5. NASA Group Achievement Award on Polar/CEPPAD team, 1998.
6. NASA Group Achievement Award on Polar/CEPPAD team, 1995.
7. The Most Skillful Chairperson in 1994 workshop on: "Coupling of Micro- and Meso-scale Processes in Space Plasma Transport," October 16-19, 1994, Guntersville, Alabama.
8. National Citation of Merit from Academia Sinica for Research Project: "Interaction of Intense Laser Light with Plasmas," 1988.
9. Best Research Paper Award for young scientists from Shanghai Science and Technology Association for the work: "Effect of Small-Scale DC Magnetic Fields on Filamentation in Laser-Produced Plasmas," 1987.

Current Research Activities:

Dynamics of Earth's space environment, particularly in the magnetosphere; energy conversion from the solar wind into the magnetosphere, particle acceleration and transport, magnetic storms and substorms, and space weather effects. In particular:

- (1) the source, loss, energization, and transport of relativistic electrons in the magnetosphere, especially during major geomagnetic storms when the relativistic electrons have their largest variations, with the goal of understanding the fundamental physical mechanisms and making reliable prediction and forecast of the variations based on physical models.
- (2) energetic particle injection and magnetic and electric field configuration changes associated with geomagnetic storms and magnetospheric substorms.
- (3) spatial structure and temporal variation of electric and magnetic fields in the inner magnetosphere.
- (4) energetic particle instrument development and spacecraft design.

Spaceflight Programs Involved:

Principal Investigator (PI) on NSF funded CubeSat mission: Colorado Student Space Weather Experiment (CSSWE), a \$840,000 project heavily involved with students. The CubeSat system is to be delivered by the end of 2011 (to be launched in 2012).

Deputy-PI on NASA/Living With a Star (LWS)/Radiation Belt Storm Probe (RBSP)/Mission of Opportunity Radbelt Experiment (MORE), a \$1.5 Million project for the phase A study, 2007-2009. PI: Dan Baker.

Co-Investigator on NASA/LWS/RBSP/Energetic Particle, Composition, and Thermal Plasma (ECT) instrument suite, to be launched in 2012. PI: Harlan Spence.

Co-Investigator on NASA/LWS/RBSP/Electric Field and Waves (EFW), to be launched in 2012. PI: John Wygant.

Co-Investigator on NASA/THEMIS (Time History of Events and Macroscale Interactions During Substorms) mission. THEMIS, one of NASA/MIDEX missions, consisting of five space probes, was launched on 17 Feb. 2007. PI: Vassilis Angelopoulos. Currently we are on extended mission.

Co-Investigator of NASA/SAMPEX (Solar, Anomalous, and Magnetospheric Particle Explorer). NASA stopped the operation in June 2005 and gave it to the Dept. of Defense. It is currently operated by Aerospace Corporation. Data are still collected and data analysis and archiving continues. PI: Glenn Mason.

Co-Investigator of NASA/IMEX (Inner Magnetosphere Explorer), a university explorer project, we completed the Phase A study, 1998-1999. PI: John Wygant.

Co-Investigator of Beijing University of Aeronautics and Astronautics Small Satellites Mission, consisting of three satellite, to be launched in 2012. PI: Jinbin Cao.

Team member of NASA/POLAR/CEPPAD (Comprehensive Energetic Particle and Pitch Angle Distribution Experiment), operation ceased in April 2008 but data analysis and modeling work continues. PI at CU: Dan Baker.

Team member of NASA/CLUSTER/RAPID, in operation. Currently we are on extended mission. PI at CU: Dan Baker.

Publications:

Peer-Refereed Journal Papers:

1. Luo, B. X. (grad student), W. C. Tu (grad student), X. Li, J. C. Gong, S. Q. Liu, E. Burin des Roziers, and D. N. Baker, (2011), On energetic electrons (>38 keV) in the central plasma sheet: Data analysis and modeling, *J. Geophys. Res.*, in press.
2. Shen, C., Z. J. Rong, X. Li, Yonghui Ma, Z. X. Liu, M. Dunlop, E. Lucek (2011), The Roles of Tail Current Sheet with Strong Guiding Field in the Evolution of Substorms, *J. Geophys. Res.*, to be submitted.
3. Tu, Weichao (grad student) and Xinlin Li (2011), Adiabatic Effects on Radiation Belt Electrons at Low Altitude, *J. Geophys. Res.*, under review.
4. Turner, D. L. (grad student), X. Li, E. Burin des Roziers, and S. Monk (2011), An improved forecast system for relativistic electrons at geosynchronous orbit, *Space Weather*, 9, S06003, doi:10.1029/2010SW000647.
5. Rong, Z. J., C. Shen W. X. Wan, X. Li, M. W. Dunlop, A. A. Petrukovich, L.-N. Hau, E. Lucek, H. Reme (2011), Statistical survey on the magnetic structure in magnetotail current sheets, *J. Geophys. Res.*, in press.
6. Palo, S. E., X. Li, D. Turner, D. Gerhardt, V. Hoxie, R. Kohnert, and S. Batiste (2011), The Colorado Student Space Weather Experiment : A CubeSat for Space Physics, *Adv. Space Res.*, under review.
7. Turner, D. (grad student), S. Eriksson, W. Tu, W. Liu, T. D. Phan, X. Li, W.-L. Teh, V. Angelopoulos, J. P. McFadden, and K. -H. Glassmeier (2011), Multi-spacecraft observations of a foreshock-induced magnetopause disturbance exhibiting distinct plasma flows and an intense density compression, *J. Geophys. Res.*, in press.
8. Li, X., S. Palo, and R. Kohnert, Small Mission for Space Weather Research, *Space Weather*, 9, S04006, doi:10.1029/2011SW000668.
9. Ma, Yonghui, Chao Shen, Xinlin Li, A. T. Y. Lui, V. Angelopoulos, Zhenxing Liu, M. Dunlop, J. P. McFadden, S. Mende, H. U. Frey, H. U. Auster, D. Larson, C. T. Russell (2011), The Global Evolution of a Moderately Intense Substorm Observed by THEMIS, *J. Geophys. Res.*, under review.
10. Yang, B., Q.-G. Zong, S. Y. Fu, X. Li, A. Korth, H. Reme (2011), The role of ULF waves interacting with oxygen ions at the outer ring current during storm times, *J. Geophys. Res.*, 116, A01203, doi:10.1029/2010JA015683.
11. Turner, D. L. (grad student) and X. Li (2010), Using spacecraft measurements ahead of Earth in the Parker spiral to improve terrestrial space weather forecasts, *Space Weather*, 9, S01002, doi:10.1029/2010SW000627.

12. Yang, B., Q.-G. Zong, S. Y. Fu, K. Takahashi, X. Li, Y. F. Wang, Z. Y. Pu, H. S. Fu, H. Reme, C. Yue, H. Zheng, C. Sheng (2010), Pitch angle evolutions of oxygen ions driven by ULF standing waves excited during geomagnetic storms, *J. Geophys. Res.*, in press.
13. Liu, W. (postdoc), T. E. Sarris, X. Li, R. Ergun, V. Angelopoulos, J. Bonnell, K. H. Glassmeier (2010), Solar wind influence on Pc4 and Pc5 ULF wave activity in the inner magnetosphere, *J. Geophys. Res.*, *115*, A12201, doi:10.1029/2010JA015299.
14. He, Z. H., Z. X. Liu, T. Chen, C. Shen, X. Li, C. Carr, and H. Rme (2010), The large-scale magnetospheric electric field observed by Double Star TC-1, *ANNALES GEOPHYSICAE*, *28* (9): 1625-1631.
15. Sarris, T. E., W. Liu, X. Li, K. Kabin, E. Talaat, V. Angelopoulos, J. Bonnell, K.-H. Glassmeier (2010), THEMIS observations of the Spatial Extent and Excitation of Field Line Resonances, *Geophys. Res. Lett.*, *37*, L15104, doi:10.1029/2010GL044125.
16. Tu, Weichao (grad student), Richard Selesnick, Xinlin Li, and Mark Looper (2010), Quantification of the Precipitation Loss of Radiation Belt Electrons Observed by SAMPEX, *J. Geophys. Res.*, *115*, A07210, doi:10.1029/2009JA014949.
17. Turner, Drew (grad student), Xinlin Li, Geoff D. Reeves, and Howard J. Singer (2010), On phase space density radial gradients of Earth's outer belt electrons prior to sudden solar wind pressure enhancements: Results from distinctive events and a superposed epoch analysis, *J. Geophys. Res.*, *115*, A1, doi:10.1029/2009JA014423.
18. Burin des Roziers, E. (grad student), X. Li, D. N. Baker, T. A. Fritz, R. L. McPherron, and I. Dandouras (2009), Cluster observations of energetic electron flux variations within the plasma sheet, *J. Geophys. Res.*, *114*, A11208, doi:10.1029/2009JA014239.
19. Liu, W. (postdoc), T. E. Sarris, X. Li, S. R. Elkington, R. Ergun, V. Angelopoulos, J. Bonnell, K. H. Glassmeier (2009), Electric and magnetic field observations of Pc4 and Pc5 pulsations in the inner magnetosphere: a statistical study, *J. Geophys. Res.*, *114*, A12, doi:10.1029/2009JA014243.
20. Li, L. Y., J. B. Cao, G. C. Zhou, and X. L. Li (2009), Statistical roles of storms and substorms in changing the entire outer zone relativistic electron population, *J. Geophys. Res.*, *114*, A12, doi:10.1029/2009JA014333.
21. Burin des Roziers, E. (grad student), X. Li, D. N. Baker, T. A. Fritz, R. Friedel, T. G. Onsager, and I. Dandouras (2009), Energetic plasma sheet electrons and their relationship with the solar wind: A Cluster and Geotail study, *J. Geophys. Res.*, *114*, A02220, doi:10.1029/2008JA013696.
22. Sarris, T. E., W. Liu, K. Kabin, X. Li, S. R. Elkington, R. Ergun, R. Rankin, V. Angelopoulos, J. Bonnell, J. McFadden, K. H. Glassmeier, and U. Auster (2009), Characterization of ULF Pulsations by THEMIS, *Geophys. Res. Lett.*, *36*, L04104, doi:10.1029/2008GL036732.
23. Li, X., A. B. Barker, D. N. Baker, W. C. Tu, T. E. Sarris, R. S. Selesnick, R. Friedel, and C. Shen (2009), Modeling the deep penetration of outer belt electrons during the 'Halloween' magnetic storm in 2003, *Space Weather*, *7*, S02004, doi:10.1029/2008SW000418.

24. Sarris, T. E., A. N. Wright, and X. Li (2009), Observations and Analysis of Alfvén wave phasemixing in the Earth's magnetosphere, *J. Geophys. Res.*, *114*, A01213, doi:10.1029/2007JA012660.
25. Tu, Weichao (grad student), X. Li, Y. Chen, G. Reeves, and M. Temerin (2009), Storm-Dependent Radiation Belt Electron Dynamics, *J. Geophys. Res.*, *114*, A02217, doi:10.1029/2008JA013480.
26. Liu, Wenlong (postdoc), X. Li, T. Sarris, C. Cully, R. Ergun, V. Angelopoulos, D. Larson, A. Keiling, K. H. Glassmeier, and U. Auster (2009), Observation and modeling of the injection observed by THEMIS and LANL satellites during March 23, 2007 substorm event, *J. Geophys. Res.*, *114*, A00C18, doi:10.1029/2008JA013498.
27. Sarris, T., X. Li, and H. J. Singer (2009), A Long-Duration Narrow-Band Pc5 Pulsation, *J. Geophys. Res.*, *114*, A01213, doi:10.1029/2007JA012660.
28. Zong Q.-G., X.-Z. Zhou, Y. F. Wang, X. Li, P. Song, D. N. Baker, T. A. Fritz, P. W. Daly, M. Dunlop, A. Pedersen (2009), Energetic electron response to ULF waves induced by interplanetary shocks in the outer radiation belt, *J. Geophys. Res.*, *114*, A10204, doi:10.1029/2009JA014393.
29. Shen, C., Z. J. Rong, X. Li, M. Dunlop, Z. X. Liu, H. V. Malova, E. Lucek, and C. Carr (2008), Magnetic configurations of magnetotail tilted current sheets, *Annales Geophysicae*, *26*, 3525-2543.
30. Xie, L., W. Tu, X. Li, and Z. Pu (2008), A Study on the new proton radiation belt formation and loss during the Halloween storm in 2003, *Chinese Journal of Geophysics*, *52*(5), P353.
31. Lui, A. T. Y., S. B. Mende, O. LeContel, W. Liu, H. Frey, V. Angelopoulos, D. G. Sibeck, K.-H. Glassmeier, J. P. McFadden, D. Larson, J. Bonnell, X. Li, M. Nose, and H. Singer (2008), Determination of the Substorm Initiation Region From a Major Conjunction Interval of THEMIS Satellites, *J. Geophys. Res.*, *113*, A00C04, doi:10.1029/2008JA013424.
32. Turner, Drew (grad student) and X. Li (2008), Radial gradients of phase space density of the outer radiation belt electrons prior to sudden solar wind pressure enhancements, *Geophys. Res. Lett.*, *35*, L18101, doi:10.1029/2008GL034866.
33. Cliver, E., K. Balasubramaniam, Nariaki Nitta, Xinlin Li, and Patrick S. McIntosh (2008), The Great Geomagnetic Storm of 9 November 1991: Origin in a Quiet Sun Region, *J. Geophys. Res.*, *114*, A00A20, doi:10.1029/2008JA013232.
34. Keiling, A., V. Angelopoulos, D. Larson, J. McFadden, C. Carlson, M. Fillingim, G. Parks, S. Frey, K.-H. Glassmeier, H. U. Auster, W. Magnes, W. Liu, and X. Li (2008), Multiple intensifications inside the auroral bulge and their association with plasma sheet activities, *J. Geophys. Res.*, *113*, A12216, doi:10.1029/2008JA013383.
35. Shen, C., Z. X. Liu, X. Li, M. Dunlop, E. Lucek, Z. J. Rong, Z. Q. Chen, C. P. Escoubet, H. V. Malova, A. T. Y. Lui, A. Fazakerley, A. P. Walsh, C. Mouikis (2008), Flattened Current Sheet and its Evolution in Substorms, *J. Geophys. Res.*, *113*, A07S21, doi:10.1029/2007JA012812.
36. Keiling, A., V. Angelopoulos, D. Larson, R. Lin, J. McFadden, C. Carlson, J. W. Bonnell, F.S. Mozer, K.-H. Glassmeier, U. Auster, S. Mende, H. Frey, A. Roux, O. LeContel, S. Frey, T. Phan, E. Donovan,

- C. T. Russell, I. Mann, W. Liu, X. Li, M. Fillingim, G. Parks, K. Yumoto, K. Shiokawa, and J. Raeder (2008), Correlation of substorm injections, auroral modulations, and ground Pi2, *Geophys. Res. Lett.*, 35, L17S22, doi:10.1029/2008GL033969.
37. Angelopoulos, V., Sibeck, D., Carlson, C. W., McFadden, J. P., Larson, D., Lin, R. P., Bonnell, J. W., Mozer, F. S., Ergun, R., Cully, C., Glassmeier, K. H., Auster, U., Roux, A., LeContel, O., Frey, S., Phan, T., Mende, S., Frey, H., Donovan, E., Russell, C. T., Strangeway, R., Liu, J., Mann, I., Rae, J., Raeder, J., Li, X., Liu, W., Singer, H. J., Sergeev, V. A., Apatenkov, S., Parks, G., Fillingim, M., and Sigwarth, J. (2008), First Results from the THEMIS Mission, *Space Sci. Rev.*, doi: 10.1007/s11214-008-9378-4.
 38. CAO, Jinbing, Juntao DUAN, Aiming DU, Yudian MA, Zhenxin LIU, G. C. ZHOU, Dongmei Yang, Tielong Zhang, Xinlin LI, Massimo Vellante, Henri REME, Iannis DANDOURAS, E. Lucek, C. M. Carr, and Qiugang Zong (2008), Characteristics of mid-low latitude Pi2 excited by Bursty Bulk Flows, *J. Geophys. Res.*, 113, A07S15, doi:10.1029/2007JA012629.
 39. Turner, Drew (grad student), and Xinlin Li (2008), Quantitative forecast of relativistic electron flux at geosynchronous orbit based on low energy electron flux, *Space Weather*, 6, S05005, doi:10.1029/2007SW000354.
 40. Sarris, T. E., T. M. Loto'aniu, X. Li, and H. J. Singer (2007), Observations at geosynchronous orbit of a persistent Pc5 geomagnetic pulsation and energetic electron flux modulations, *Annales Geophysicae*, 25, 1653-1667, 2007.
 41. Zong, Q.-G., X.-Z. Zhou, X. Li, P. Song, S. Fu, D. N. Baker, Z. Y. Pu, T. A. Frits, A. Korth, A. Balogh, and H. Reme (2007), Ultra-Low Frequency Modulation of Energetic Particles in the Dayside Magnetosphere, *Geophys. Res. Lett.*, /sl 34, L12105, doi:10.1029/2007GL029915.
 42. Li, X., K. S. Oh, and M. Temerin (2007), Prediction of AL Index Using Solar Wind Parameters, *J. Geophys. Res.*, 112, A06224, doi:10.1029/2006JA011918.
 43. Shen, C., X. Li, M. Dunlop, Q. Q. Shi, Z. X. Liu, E. Lucek, and Z. Q. Chen (2007), Magnetic Field Rotation Analysis and the Applications, *J. Geophys. Res.*, 112, A06211, doi:10.1029/2005JA011584.
 44. Shen, C., M. Dunlop, X. Li, Z. X. Liu, A. Balogh, T. L. Zhang, C. M. Carr, and Q. Q. Shi (2007), New approach for determining the normal of the bow shock based on cluster 4-point magnetic measurements, *J. Geophys. Res.*, 112, A03201, doi: 10.1029/2006JA011699.
 45. Gannon, J. L. (grad student), X. Li, and D. Heynderickx (2007), Pitch Angle Distribution Analysis of Radiation Belt Electrons Based on CRRES MEA data, *J. Geophys. Res.*, 112, A05212, doi:10.1029/2005JA011565.
 46. Sarris, T. E. (postdoc), X. Li, and M. Temerin (2006), Simulating radial diffusion of energetic (MeV) electrons through a model of fluctuating electric and magnetic fields, *Annales Geophysicae*, 24, 1-16.
 47. Li, X., M. Temerin, B. T. Tsurutani, S. Alex (2006), Modeling of 1-2 September 1859 super magnetic storm, *Adv. Space Res.* 38, 273-279.

48. Zheng, Y., A. T. Y. Lui, X. Li, and M. Fok (2006), Characteristics of 2-6 MeV electrons in the slot region and inner radiation belt, *J. Geophys. Res.*, *111*, A10204, doi:10.1029/2006JA011748.
49. Li, X., D. N. Baker, T. P. O'Brien, L. Xie, and Q. G. Zong (2006), Correlation between the inner edge of outer radiation belt electrons and the innermost plasmapause location, *Geophys. Res. Lett.*, Vol. 33, No. 14, L14107, 10.1029/2006GL026294.
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51. Burin des Roziers, E. (grad student) and X. Li (2006), Specification of >2 MeV geosynchronous electrons based on solar wind measurements, *Space Weather*, *4*, S06007, doi:10.1029/2005SW000177.
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57. Li, X. (2004), Variations of 0.7-6.0 MeV Electrons at Geosynchronous Orbit as a Function of Solar Wind, *Space Weather*, *2*, No. 3, S0300610.1029/2003SW000017.
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71. Li, X., M. Temerin, D. N. Baker, G. D. Reeves, and D. Larson (2001), Quantitative Prediction of Radiation Belt Electrons at Geostationary Orbit Based on Solar Wind Measurements, *Geophys. Res. Lett.*, *28*, 1887.
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3. Li, X. (2002), Radiation Belt Electrons and Substorm Injections, *International Conference on Substorms-6 Proceedings*, Ed. by R. M. Winglee, page 305.
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Invited talks at professional conferences and seminars at various institutes (contributed talks are not listed here):

1. **On the relation between solar wind and MeV electrons at geosynchronous orbit – Knowledge gained from data analyzing and modeling for the last two solar cycles–** , Seminar given at the Academy of Science of China, Beijing, on 5 May 2011. *Chao Shen*
2. **The Behavior of MeV Electrons at Geosynchronous Orbit During the Last two Solar Cycles: Renewed Understanding of the External Driver**, Seminar given at LASP, University of Colorado at Boulder, on 1 March 2011. *Stefan Eriksson*
3. **Determining the loss of radiation belt electrons: What measurements and models are required?(What will our CubeSat do?)**, Seminar given at Dept. of Aerospace Engineering Sciences, University of Colorado at Boulder, on 3 November 2010. *Jeff Forbes*
4. **CubeSat: Colorado Student Space Weather Experient**, Seminar given at Peaking Univerisity, Beijing, August 31, 2010. *Suiyan Fu*
5. **Determining the Loss of Radiation Belt Electrons: What Measurements and Models are Required?** Seminar given at The Center for Space Science and Applied Research, Chinese Academy of Sciences, Beijing, August 31, 2010. *Shen Chao*
6. **Energetic electrons in the central plasmashet and ULF in the inner magnetosphere: CLUSTER and THEMIS observations**, INVITED talk, at CLUSTER 10th Anniversary Workshop at CORFU, Greece, September of 2010. *Matt Taylor*
7. **Quantify the precipitation loss of radiation belt electrons observed by SAMPEX and Introduction of the USA NSF CubeSat Program**, at Chinese Space Weather Meeting in Shanghai, July 28-Aug 2, 2010. *Fengsi Wei*
8. **Long term observation of solar wind, inner magnetosphere, and radiation belt electrons**, at “ERG, SCOPE and Beyond” workshop at JAXA, ISAS (Sagamihara Campus), Japan, 2-5 Nov., 2009. *Yoshizumi Miyoshi*
9. **NASA Radiation Belt Storm Probe Mission**, at “ERG, SCOPE and Beyond” workshop at JAXA, ISAS (Sagamihara Campus), Japan, 2-5 Nov., 2009. *Yoshizumi Miyoshi*
10. **Latest Advancement on Space Weather Prediction**, at the Second International Space Weather Conference in Nanjing, China, October 17-21, 2009. *Chuanyi Tu*

11. **Variability of radiation belt electrons at Earth**, at European Planetary Science Congress, Potsdam, Germany, Sept., 2009. *Nicolas Andrew*
12. **Space Weather: why do we care?** Seminar given at Peking University, Beijing, May 20, 2009. *Lun Xie*
13. **Challenges in Space Weather**, Seminar given at The Center for Space Science and Applied Research, Chinese Academy of Sciences Beijing, May 21, 2009. *Shen Chao*
14. **Forecast of Relativistic Electron Flux at Geosynchronous Orbit With and Without Solar Wind Input**, at EGU, April 2009. *Norma Crosby*
15. **THEMIS, NASA's First Five Spacecraft Constellation Mission**, LASP Public Lecture, April 7, 2009. *Erin Wood*
16. **THEMIS Mission, a miracle! (low cost and high science return)**, Seminar given at LASP, September 11, 2008. *Phil Chamberlin*
17. **THEMIS Mission, a miracle! (low cost and high science return)**, Seminar given at The Center for Space Science and Applied Research, Chinese Academy of Sciences Beijing, July 10, 2008. *Shen Chao*
18. **Energetic Particle Injections Observed by THEMIS and Other Satellites**, AOGS (Asia Oceania Geosciences Society), June 17, 2008, Busan, Korea. *Xiaohua Deng*
19. **Quantitative Forecast of Relativistic Electron Flux at GEO Based on Measured Energetic Electron Flux Only**, Seminar given at The Center for Space Science and Applied Research, Chinese Academy of Sciences Beijing, March 31, 2008. *Shen Chao*
20. **Predicting Relativistic Electron Flux at GEO Based on Local Electron Flux only and/or Solar Wind Measurements**, Seminar given at Peking University, Beijing, March 28, 2008. *Lun Xie*
21. **What THEMIS can do for inner magnetospheric sciences during its extended mission phase**, THEMIS team meeting, Dec. 15 of 2007, at U. of California at Berkeley. *David Sibeck*
22. **Challenge in Space Weather**, at the 3rd Chinese CAWSES Space Weather Symposium, Aug. 7-10, 2007, Guiyang, China. *Xueshang Feng*
23. **Prediction of the Dst and AL Indices Using Solar Wind Parameters**, at the 3rd Chinese CAWSES Space Weather Symposium, Aug. 7-10, 2007, Guiyang, China. *Xueshang Feng*
24. **Simulating Radial Diffusion of Outer Radiation Belt Electrons**, AOGS, Aug. 2, 2007, Bangkok, Thailand. *Mei-Ching Fok*
25. **THEMIS' Contribution to Radiation Belt Sciences**, at the pre-THEMIS Launch Science Meeting, Radisson Resort at the Port, Cape Canaveral Florida, 2/13-14/07. *David Sibeck*

26. **Real-time forecast, how do we deal with real-time data gaps?** Workshop on Issues Regarding Real-Time Forecast, LASP, 2/8/07. *Michael Gehmeyr*
27. **THEMIS' Contribution to Radiation Belt Study**, THEMIS science workshop, Space Sciences Lab, UC Berkeley, December 15, 2006. *David Sibeck*
28. **The Role of Radial Transport in Accelerating Radiation Belt Electrons**, Seminar given at NCAR/HAO on December 6, 2006. *Mike Wiltberger*
29. **Radial transport in energizing radiation belt electrons in the magnetosphere**, COSPAR 36th, Beijing, China, July 16-23, 2006. *Obara*
30. **Sun, Solar Wind, and Geomagnetic Storms**, Western Pacific Geophysics Meeting, Beijing, July, 2006. *Jie Zhang*.
31. **On the relation between plasmasphere and outer Radiation belt electrons**, Western Pacific Geophysics Meeting, Beijing, July, 2006. *Mei-Ching Fok*.
32. **Relation Between Plasmasphere and Outer Radiation Belt**, Seminar given at The Center for Space Science and Applied Research, Chinese Academy of Sciences Beijing, 11 May, 2006. *Shen Chao*
33. **Solar Wind and Geomagnetic Storms**, International Living With a Star (ILWS) Workshop on "The Solar Influence on the Heliosphere and Earth's Environment: Recent Progress and Prospects," Goa, India, Feb. 19-24, 2006. *David Sibeck*.
34. **Magnetospheric Responses to the Solar Events**, The International Space Weather Conference, Macau, China, Nov. 21-25, 2005. *Jiusheng Yao*.
35. **Solar Wind Variations and Magnetospheric Responses**, The International Space Weather Conference, Macau, China, Nov. 21-25, 2005. *Fengsi Wei*
36. **Modeling of the deep inward transport of radiation belt electrons during Oct-Nov magnetic storms of 2003**, seminar given at Peking University, Beijing, 3 August, 2005. *Suiyan Fu*
37. **Modeling of the deep inward transport of radiation belt electrons during Oct-Nov magnetic storm of 2003**, Asia Oceania Geosciences Society Meeting, Singapore, 20-24 June, 2005. *Mei-Ching Fok*
38. **The Global Interactions Between the Solar Wind and Magnetosphere**, Asia Oceania Geosciences Society Meeting, Singapore, 20-24 June, 2005. *Suiyan Fu*
39. Seminar given at LASP magnetospheric group, **Energetic electrons, 50keV - 6MeV, at geosynchronous orbit: their responses to solar wind variations**, 15 February, 2005. *Yi-Jiun Su*
40. **Acceleration of Relativistic Electrons during Recurrent Storms**, AGU Chapman Conference on "Corotating Solar Wind Streams and Recurrent Geomagnetic Activity" in Manaus, Brazil, 6-12 February 2005. *Robert McPherron*

41. **Variations of Radiation Belt Electrons as a Function of Solar Wind: Their Prediction and Physical Mechanisms**, Asia Oceania Geosciences Society, Singapore, July 5-9, 2004. *Mannuel Grande*
42. **The Predictability of the Magnetosphere and Space Weather**, Asia Oceania Geosciences Society, Singapore, July 5-9, 2004. *Wing Simon*
43. **Predicting Radiation Belt Electron Fluxes and Space Weather Implications**, Spring AGU, Montreal, Canada, May 17-21, 2004. *S. G. Kanekal*
44. **The Predictability of the Earth's Magnetosphere and Space Weather Implication**, Seminar Given at Space Weather Laboratory, Chinese Academy of Sciences, Beijing, May 17, 2004. *Chao Shen*
45. Jan. 22, 2004, Seminar given at LASP, **The Predictability of the Magnetosphere and Space Weather**. *Laila Andersson*
46. Nov. 6, 2003, Seminar given at Space Environment Center, NOAA, Boulder, **Predictability of the Magnetosphere**. *Doug Biesecker*
47. April 6-11, 2003, EGS-EGU-AGU, Nice, France. **Enhanced physical understanding based on prediction of relativistic electrons using solar wind as input**. *Manuel Grande*
48. March 25-29, 2003, Advanced Research Workshop on Effects of Space Weather on Technology Infrastructure (ESPRIT), on the island of Rhodes, Greece. **Radiation Belt Forecasting**. *Yannis Daglis*
49. Jan. 6-8, 2003, Relativistic Electron Workshop at Maui, Hawaii. **Current Status of the Theory and Modeling of Radiation Belt Electrons in the Magnetosphere**. *J. B. Blake*
50. Oct. 28-29, 2002, GOES Energetic Particle Workshop at NOAA/SEC Boulder, Colorado. **Requirements for High-energy Electron Measurements**. *J. Mazur*
51. Oct. 10, 2002, Huntsville 2002, Astrophysical Particle Acceleration in Geospace and Beyond, at Chattanooga, Tennessee. **Acceleration of Relativistic Electrons in the Earth's Magnetosphere**. *J. Horwitz*
52. July 9-12, 2002 Western Pacific Geophysical Meeting, Wellington, New Zealand. **Long Term and Short Term forecast of Radiation Belt Electrons**. *Steve Curtis*
53. March 25-29, 2002, The Sixth International Conference on Substorms (ICS-6) University of Washington, Seattle, Washington. **Influence and Signatures of Energetic Particles in Substorm Development**. *R. Winglee*
54. Feb. 14, 2002, Seminar given at LASP, **SUN-EARTH CONNECTION: Quantitative Prediction of Radiation Belt Electrons in the Earth's Magnetosphere Based on Solar Wind Measurements**. *Greg Kopp*

55. Jan. 3, 2002, Seminar given at the Department of Aerospace Engineering Sciences of University of Colorado, **Quantitative Prediction of Radiation Belt Electrons in the Earth's Magnetosphere Based on Solar Wind Measurements** *Charbel Farhat*.
56. June 28, 2001, Seminar given at the Department of Geophysics, Peking University, Beijing, **Sun-Earth Connection**. *Z. Pu*
57. June 27, 2001, Seminar given at Center for Space Science and Applied Chinese Academy of Sciences, Beijing. **Sun-Earth Connection**. *Chao Shen*
58. June 27, 2001, Seminar given at Center for Space Science and Applied Research, Chinese Academy of Sciences, Beijing. **Quantitative Prediction of Radiation Belt Electrons in the Earth's Magnetosphere Based on Solar Wind Measurements**. *Chao Shen*
59. July 24-27, 2001, International Space Environment Conference 2001: Radiation Belt Science and Technology (ISEC 2001), at Queenstown, New Zealand. **Long Term Measurements of MeV Electrons by SAMPEX and Quantitative Prediction of MeV Electrons at Geostationary Orbit Using Solar Wind as the Only Input**. *Anthony Chan*
60. April 9-11, 2001, ISTP workshop, at APL, Maryland. **Quantitative Prediction of Radiation Belt Electrons in the Earth's Magnetosphere Based on Solar Wind Measurements**. *D. N. Baker*
61. March 28, 2001, Invited Seminar Speaker on **Quantitative Prediction of Radiation Belt Electrons at Geostationary Orbit Based on Solar Wind Measurements** at Solar Terrestrial Environment Lab at University of Nagoya, Japan. *Y. Kamide*
62. March 14, 2001, AGU Chapman Conference on Storm-Substorm Relationship at Lonavala, India. **Quantitative Prediction of Radiation Belt Electrons at Geostationary Orbit Based on Solar Wind Measurements**. *S. Sharma*
63. Nov. 10, 2000, Seminar given at Center For Integrated Plasma Studies (CIPS)/U. of Colorado on **Quantitative Prediction of MeV Electrons at Geostationary Orbit on the Basis of Solar Wind Measurements**. *Chet Nieter*
64. Oct. 19, 2000, Seminar given at Space Environment Center/NOAA on **Quantitative Prediction of MeV Electrons at Geostationary Orbit on the Basis of Solar Wind Measurements**. *Tom Detman*
65. Sept. 28, 2000, COSPAR-Colloquium, Space Weather Study Using Multi-point Techniques, at Taipei, Taiwan, **Predicting MeV Electron Variations at Geosynchronous Orbit From a Physics-based Diffusion Model Using Solar Wind as the Only Input**. *J. Chao*
66. Aug. 31, 2000, Seminar given at LASP/U. of Colorado on **Quantitative Prediction of MeV Electrons at Geostationary Orbit on the Basis of Solar Wind Measurements**. *Amanda Hendrix*

67. May 19, 2000, International Conference on Substorms-5 at St. Petersburg, Russia. **Modeling Particle Injections–Test Particle Simulations.** *Dick Wolf*
68. April, 29, 2000, EGS 2000 at Nice France, **Energetic Particle Dynamics in the Earth’s Magnetosphere.** *Manuel Grande*
69. Nov. 23, 1999, Invited Seminar Speaker on **Energetic Particle Dynamics in the Earth’s Magnetosphere**, University of Alaska, Fairbanks. *A. R. Chowdhury*
70. Nov. 22, 1999, Invited Guest Lecturer on **The Mystery of Dispersionless Injection of Energetic Particles Associated With Magnetospheric Substorms**, University of Alaska. *A. R. Chowdhury*
71. June 21, 1999, NSF/GEM Workshop at Snowmass, Colorado, **Rapid Enhancements of Relativistic Electrons Deep in the Magnetosphere During the May 15, 1997 Magnetic Storm.** *Geoff Reeves*
72. June 22, 1999, NSF/GEM Workshop at Snowmass, Colorado, **Simulation of energetic particle injections due to interplanetary shock impact and substorm on Aug. 26, 1998.** *Mary Hudson*
73. Jan. 18, 1999, Relativistic Electron Workshop, Maui, Hawaii, **REVIEW Talk: Outer Radiation Belt Electrons.** *J. B. Blake*
74. Jan. 14, 1999, Space Environment Center/NOAA, Boulder, Colorado, **Dispersionless Injections and Drift Echoes of Energetic Particles Associated With Magnetospheric Substorms.** *Rodney Vierek*
75. Nov. 5, 1998, LASP, University of Colorado, Boulder, **Dispersionless Injections and Drift Echoes of Energetic Particles Associated With Magnetospheric Substorms.** *Dan Baker*
76. Nov. 3, 1998, IGPP, University of California, Los Angeles, **Dispersionless Injections and Drift Echoes of Energetic Particles Associated With Magnetospheric Substorms.** *Bob McPherron*
77. Oct. 25, 1998, Sixth Huntsville Modeling Workshop, Guntersville, Alabama, **REVIEW Talk: Recent Radiation Belt Enhancements.** *Bob Hoffman*
78. Sept. 24, 1998, ISTP European Science Workshop/The Inner Magnetosphere Session, **Keynote Address: Initial Enhancements of Relativistic Electrons in the Magnetosphere in Response to Solar Wind.** *Howard Singer and Geoff Reeves*
79. June 17, 1998, NSF/GEM Workshop at Snowmass, Colorado, **Simulation of Dispersionless Injections and Subsequent Drift Echos of Energetic Electrons Associated with Substorms.** *J. Birn*
80. June 16, 1998, NSF/GEM Workshop at Snowmass, Colorado, **TUTORIAL Talk: Radiation Belt Electrons: Current Understanding and Remaining Problems.** *Geoff Reeves*
81. June 15, 1998, NSF/GEM Workshop at Snowmass, Colorado, **Differences and causes of the initial enhancements of relativistic electrons during different storms.** *Geoff Reeves*

82. June 19, 1997, NSF/GEM Workshop at Snowmass, Colorado, **Source of Relativistic Electrons in the Magnetosphere: Present Knowledge and Remaining Questions.** *Mary Hudson*
83. June 18, 1997, NSF/GEM Workshop at Snowmass, Colorado, **Energetic electron injections into the inner magnetosphere during January 10-11, 1997 magnetic cloud event.** *Geoff Reeves*
84. March 7, 1997, Air Force Research Laboratory, Hanscom Field, MA 01731, **Source of Relativistic Electrons in the Magnetosphere: Present Knowledge and Remaining Questions.** *Greg Ginet*
85. March 6, 1997, Princeton Plasma Physics Laboratory, **Present Understanding of Radiation Belt Electrons in the Magnetosphere and Remaining Problems.** *Frank Cheng*
86. March 4, 1997, **Radiation Belt Electrons in the Magnetosphere: Present Knowledge and Remaining Problems.** *John Wygant*
87. Jan. 22, 1997, LASP, University of Colorado, **Solar Wind and Relativistic Electrons in the Earth's Magnetosphere.** *Dan Baker*
88. June 26, 1996, NSF/GEM Workshop at Snowmass, Colorado, **Solar Wind Effects on Relativistic Electrons in the Magnetosphere.** *Geoff Reeves*
89. May 7, 1996, Space Environment Center/NOAA, Boulder, Colorado, **The Source, Loss, Energization, and Transport of Relativistic Electrons in the Magnetosphere.** *Terry Onsager*
90. April 16, 1996, COSPAR Colloquium at Beijing, **Multi-Satellite Observations of the Outer Zone Electron Variation During the 1-10 November 1993.** *R. L. Xu*
91. March 7, 1996, Data Workshop for the National Space Weather Event, Nov. 3-4, 1993 magnetic storm, **Correlation between solar wind condition with enhancement of relativistic electrons in the magnetosphere.** *John Freeman*
92. March 6, 1996, Department of Space Physics and Astronomy, Rice University, **Formation of Radiation Belts in the Magnetosphere.** *Anthony Chan*
93. March 4, 1996, Front Range Branch AGU Annual Meeting, **Solar Wind Effects on Relativistic Electrons in the Magnetosphere.** *Dan Baker.*
94. Jan. 11, 1996, NSF/GEM GGCM Campaign/SEC Space Weather Workshop, Boulder, Colorado, **Rapid Loss of Outer Zone Electrons.** *Mary Hudson*
95. Oct. 18, 1995, Workshop on Radiation Belts: Model & Standards, Brussels, Belgium, Oct. 17-20, 1995, **Simulation of the Rapid Formation of a New Electron Radiation Belt During March 24, 1991 SSC.** *Joe Lemaire*
96. Oct. 5, 1995, LASP, University of Colorado, **New Radiation Belts in the Magnetosphere.** *Dan Baker*

97. May 15, 1995, Department of Physics, University of Alberta, Edmonton, Canada, **Formation of Radiation Belts in the Magnetosphere.** *Gordon Rostoker.*
98. Feb. 24, 1995, Cambridge Symposium-Workshop, Feb. 20-25, 1995-Bermuda, **Characteristics of Velocity Moments of the Ion Distribution Function in the Earth's Magnetosheath.** *Tom Chang*
99. Feb. 17, 1995, Physics Department, Auburn University, Auburn, Alabama, **New Radiation Belts in the Magnetosphere.** *Steve Knowlton*
100. Oct. 27 PM, 1994, High Altitude Observatory, NCAR, Boulder, Colorado, **New Radiation Belts in the Magnetosphere.** *Paul Song*
101. Oct. 27 AM, 1994, Space Environment Laboratory, NOAA, Boulder, Colorado, **Observation and Simulation of the Rapid Formation of a New Electron Radiation Belt During March 24, 1991 SSC.** *Howard Singer*
102. Oct. 25, 1994, Space and Atmospheric Sciences Division, Los Alamos National Laboratory, **Formation of New Radiation Belts During the March 24, 1991, SSC.** *Michelle Thomsen*
103. Aug. 15, 1994, Taos Workshop on the Earth's Trapped Particle Environment, **Observation and Simulation of the Rapid Formation of a New Electron Radiation Belt During March 24, 1991 SSC.** *Geoff Reeves*
104. July 26, 1994, Western Pacific Geophysics Meeting, Hongkong, **Field-Aligned Energization of Ions by Ponderomotive Force.** *Tom Chang*
105. June 3, 1994, Workshop at Goddard Space Flight Center, **Simulation and Observation of Particle Energization During the March 24, 1991 SSC.** *David Stern*
106. Dec. 14, 1993, Air Force Research Laboratory (former AFGL), Hanscom Field, MA 01731, **Simulation of the Prompt Creation of the New Radiation Belt during the March 24, 1991 SSC.** *Greg Ginet*
107. Nov. 12, 1993, Herzberg Institute of Astrophysics, National Council of Canada, Ottawa, **Simulation of the Prompt Creation of the New Electron Radiation Belt during the March 24, 1991 SSC.** *Brian Whalen*
108. Oct., 1992, Institute for the Study of Earth, Oceans and Space, University of New Hampshire, **Ponderomotive Effects on Ion Acceleration in the Auroral Zone.** *Phill Isenberg*
109. Aug., 1992, Lockheed Palo Alto Research Laboratories, **Ponderomotive Effects on Ion Acceleration in the Auroral Zone.** *Dan Murphy*
110. April, 1992, Center for Space Physics, Rice University, **Ring Current Oxygen Ion Interaction with Micropulsations.** *Pat Reiff*

111. Mar., 1992, Institute for the Study of Earth, Oceans and Space, University of New Hampshire, **Loss of Ring Current O^+ Ions due to Interaction with Pc 5 Waves**. *Phill Isenberg*
112. Feb., 1992, Space Sciences Laboratory, University of California, Berkeley, **Loss of Ring Current O^+ Ions due to Interaction with Pc 5 Waves**. *Bob Lin*

Research Funding Received as PI: (for the following grants in which I am the PI. Unless specified, there are no funded co-investigators, 100% of the funds are for myself and my research group)

1. NSF/CubeSat Program
Title: CubeSat: Colorado Student Space Weather Experiment
\$834,794 (\$195,418 is allocated to Dept. of Aerospace Engineering Sciences for Dr. Palo, a Co-PI on this project), 1/01/10-12/31/12.
2. NASA/LWS TR&T Program
Title: Loss of Outer Radiation Belt Electrons, a high priority of LWS/RBSP mission.
\$274,618, 5/07/09-6/07/12.
3. NASA/Guest Investigator Program
Title: Energetic Electron Dynamics in the Magnetosphere
\$338,849, 5/01/09-4/30/12.
4. NSF/Base Program
Title: Acceleration of Radiation Belt Electrons: in situ vs inward radial transport
\$302,300, 4/01/09-3/31/12.
5. NSF/GEM Program
Title: Phase Space Density Gradient of Energetic Electrons at Geosynchronous Orbit During Sharp Solar Wind Pressure Enhancements
\$154,025, 6/01/09-5/31/11.
6. CU/LASP Internal Seed Grant
Title: Spaceflight Instrument Development: Miniaturizing REPT (relativistic electron and proton telescope) for NSF CubeSat
\$15,000, 1/15/08-12/31/08.
7. NSF/Base Program
Title: Quantification of Radial Diffusion in Energizing MeV Electrons in the Magnetosphere
\$244,398, 3/31/06-4/1/09.
8. NSF/National Space Weather Program
Title: Quantitative Forecast and Specification of Radiation Belt Electrons
\$267,557, 7/15/05-7/14/09.

9. NASA/Living With a Star Program
Title: Dynamics of Radiation Belt Electrons Associated with Solar Wind Variations
\$223,871, 5/01/03-4/30/07.
10. NSF/Base Program supplement fund for supporting a graduate student
Title: Source of Radiation Belt Electrons.
\$30,000, 9/1/04–1/31/06.
11. NSF/Base Program
Title: Source of Radiation Belt Electrons.
\$228,730, 2/1/03–1/31/07.
12. NASA NRA-01-SEC-041
Title: Solar Wind Fluctuations and Their Consequences on the Magnetosphere
\$255,737, 3/1/01 - 2/28/05.
13. NASA/Living With a Star Program/EPO supplement fund, 75% for supporting Co-I: Emily CoBabe-Ammann of LASP and 25% sub-contracted to NASA/Langely Center.
\$45,000, 5/01/03-4/30/06.
14. NSF/GEM Program
Title: Detailed study of the magnetic storms selected for GEM Inner Magnetosphere and Storms Campaign
\$150,000, 6/1/01–5/31/04.
15. NASA NRA-99-OSS-01
Title: Energization and Loss of Outer Radiation Belt Electrons.
\$23,000, 7/15/03-7/14/04.
16. NASA NRA-99-OSS-01
Title: Energization and Loss of Outer Radiation Belt Electrons.
\$127,578, 7/15/00-7/14/03.
17. NSF/GEM, ATM-9901085
Title: Energetic Particle Dynamics During Geomagnetic Storms and Magnetospheric Substorms (supplement fund for undergraduate research experiences)
\$5,000, 10/1/00–9/30/01.
18. NSF/GEM, ATM-9901085
Title: Energetic Particle Dynamics During Geomagnetic Storms and Magnetospheric Substorms.
\$123,070, 10/1/99–9/30/02.

19. NSF/Base Program
Title: Source of Radiation Belt Electrons.
\$122,311, 10/1/99–9/30/02.
20. NASA NRA-98-OSS-01
Analyzing the Loss, Energization, and Transport of Energetic Electrons in the Magnetosphere.
\$40,500, 5/15/99–5/14/00.
21. Lockheed Martin
Title: Modeling of energetic ion dynamics associated with substorms.
\$15,000, 1/1/98–12/31/98.
22. NASA NRA-95-OSS-01
Analyzing the Loss, Energization, and Transport of Energetic Electrons in the Magnetosphere.
\$233,900, 5/15/96–5/14/99.
23. NSF/GEM
Title: Modeling Energetic Particle Injections During Geomagnetic Storms and Magnetospheric Substorms
(supplement fund for undergraduate research experiences).
\$5,000, 6/15/97–6/14/98.
24. NSF/GEM
Title: Modeling Energetic Particle Injections During Geomagnetic Storms and Magnetospheric Substorms.
\$100,087, 6/15/96–6/14/99.

Research Funding Received as Co-I:

1. CU Engineering Excellence Fund/A Vertically Integrated Picosatellite Design Laboratory for Projects Based Learning, PI: Scott Palo
\$29,657, 2010-2011.
2. NASA/Heliophysics/Geospace Science/Transport of radiation belt electrons via magnetospheric ULF waves in a realistic geomagnetic field, PI: Scot Elkington
\$539,397, 3/1/09-2/28/13.
3. NASA/LWS/RBSP/Mission of Opportunity Radbelt Explorer (MORE), PI: Dan Baker
\$1.5 Million, 12/1/06-12/31/09, for phase A study. As the Deputy-PI, I led the task of completing the Science Requirement Document (SRD).

4. NASA/LWS/RBSP/Energetic Particle, Composition, and Thermal Plasma (ECT) instrument suite, PI: Harlan Spence
\$13,521,837, 12/1/06-4/30/15. I am helping to develop the relativistic electron and proton telescope (REPT) and will be heavily involved with data analysis and modeling in the future.
5. NASA/LWS/RBSP/Electric Field Instrument (EFI), PI: John Wygant
\$3,457,245, 12/1/06-4/30/15. I am helping to specify the measurement requirement in order to achieve the definitive science objectives and will be heavily involved with data analysis and modeling in the future.
6. NASA/UNEX, Inner Magnetosphere Explorer (IMEX), PI: John Wygant
\$293,961, 10/15/98-10/31/01, for Phase A study. My basic duty was to attend the weekly meeting with engineers to bridge between the science requirements and engineering feasibility. The project was cancelled after Phase A study due to the uncertainties of the launch vehicle.
7. NASA/MIDEX, Time History of Events and Macroscale Interactions During Substorms (THEMIS), PI: Robert Ergun
\$2,508,948, 6/15/02-9/30/12. We will propose for next extended mission (to August of 2012). My portion of the funding is about \$130k/yr, covering one full time postdoc of mine and part of my summer salary.
8. NASA/SMEX, Solar, Anomalous, and Magnetospheric Particle Explorer (SAMPEX), PI: Dan Baker
\$1,351,519, 8/15/94-8/31/07. Funding received so far is \$1,301,519 and the rest (50K) covered up to 8/31/07. My portion of the funding varied year to year, ~\$10k-60k/yr. Now the NASA/SAMPEX flight mission was already ended but the data is still collected by Aerospace Corporation.

Research Funding Received as a Team Member:

1. NASA/Polar/CEPPAD, PI: Dan Baker
\$1,067,000, 1/15/02-7/31/08. My portion of the funding varies year to year, ~\$5k-20k/yr.
2. NSF/Center for Integrated Space Weather Modeling (CISM), PI: Dan Baker,
\$4,608,900, 8/1/03-7/31/12. My portion of the funding varies year to year, ~\$30k-80k/yr.
3. ESA&NASA/CLUSTER/RAPID, PI at CU: Dan Baker
\$951,237, 1/1/02-12/16/10. My portion of this funding varies year to year, ~\$5k-60k/yr.

TEACHING

Taught ASEN 3113 (Thermodynamics and Heat Transfer) alone, 79 students in Fall 2008. The teaching load for this class accounts for two teaching credits.

Created (with Prof. Palo) a new two-semester graduate course, ASEN 5519-6519: Spaceflight Hardware, which was taught in Spring and Fall of 2007 (course rating 5.9 and instructor rating 5.9). This course was taught again (with a different hardware project) in Spring (course rating 3.9 and instructor rating 4.6), Fall of 2008 and 2009, Spring of 2010.

Developed and taught (Fall 06) ASEN 5050: Space Flight Dynamics (course rating 4.5 and instructor rating 4.4)

Developed and taught (Fall 01, Spring 03, Spring 07) ASEN 5335: Aerospace Environment (course rating B, B, 3.9 and instructor rating B, B, 4.5).

Revamped and taught (Fall 02, Spring 03, 04, 05, 06) ASEN 4010: Introduction to Space Dynamics (course rating B-, A, B+, B+, B and instructor rating B, A, B+, B+, B).

Developed and taught (Fall 05) ASEN 3113: Thermodynamics and Heat Transfer (Course rating B+ and instructor rating A).

Taught (Fall 03, 04) ASEN 2002: Introduction to Thermodynamics and Aerodynamics (course rating B+, B and instructor rating A, B).

Ph.D. supervision completed

Daniel Moorer (co-supervised with Dan Baker), 6/00, "Modeling High-Energy Electron Flux in the Outer Radiation Belt", Dept. of Aerospace Engineering Sciences, University of Colorado at Boulder.

Theodore Sarris (co-supervised with N. Tsaggas), 6/03, "Energization of Hot Plasma Populations in Dynamic Magnetic Fields", Dept. of Electronic Engineering, Demokritus University of Thrace, Xanthi, Greece.

Lun Xie (co-supervised with Z. Y. Pu), 01/05, "Research on the Multiscale Dynamics of the Radiation Belt", Dept. of Geophysics, Peking University, Beijing, China.

Jennifer Gannon (Primary Advisor), 12/05, "Energetic Electron Dynamics in the Magnetosphere," Dept. of Physics, University of Colorado at Boulder.

Wenlong Liu (co-supervised with Suiyan Fu), 12/06, "The variations of N^+ in the ring current during magnetic storms," School of Earth and Space Sciences Peking University, Beijing, China.

Edward Burin des Rozières (Primary Advisor), 5/09, Dept. of Aerospace Engineering Sciences.

Drew Turner (Primary Advisor), 12/10, Dept. of Aerospace Engineering Sciences.

Ph.D. supervision in progress

Weichao Tu (expected in 2011, Primary Advisor), Dept. of Aerospace Engineering Sciences.

Rob Redmond (expected in 2012, Primary Advisor), Dept. of Aerospace Engineering Sciences.

Lauren Blum (expected in 2013, Primary Advisor), Dept. of Aerospace Engineering Sciences.

Quintin Schiller (expected in 2014, Primary Advisor), Dept. of Aerospace Engineering Sciences.

James Mason (expected in 2015, Primary Advisor), Dept. of Aerospace Engineering Sciences.

Bingxian Luo (expected in 2014, Co-Advisor), The Center for Space Science and Applied Research, Chinese Academy of Sciences, Beijing.

M.S. supervision completed

Edward Burin des Roziers, 12/05, Dept. of Aerospace Engineering Sciences.

Austin Barker, June of 2005. Austin was going for his Ph.D. degree (he passed Ph.D. preliminary exam and was preparing for his Ph.D. comprehensive exam). Unfortunately he died on 28 May 2005 from a rock climbing accident. He was awarded a posthumous M.S. degree.

Weichao Tu, 5/08, Dept. of Aerospace Engineering Sciences.

Drew Turner, 5/08, Dept. of Aerospace Engineering Sciences.

Michael Klapetzky, 1/10, Dept. of Aerospace Engineering Sciences.

Dongwon Lee, 5/10, Dept. of Aerospace Engineering Sciences.

Served on the Ph.D. thesis committee of the following students in addition to those mentioned above

Niescja E. Turner (Ph.D. in 6/00), Joshua Rigler (Ph.D. in 9/04), Kim Cierpik (Ph.D. in 5/05), Phil Chamberlin (Ph.D. in 12/05), Brian Poller (Ph.D. in 5/09), Brian Lathrop (Ph.D. expected in 12).

Postdoctoral supervision completed

Theodore Sarris, 6/03 - 11/06.

Wenlong Liu, 4/07 - 9/10

SERVICE

Service to the Research Community

- Serve on Editorial Committee of J. of Chinese Space Sciences, 2008-2010. The duties included to recommend suitable papers submitting to the journal, to review some manuscripts as a referee, to make

suggestions to improve the editorial work, etc.

- Serve as an Associate Editor for Journal of Geophysical Physics, JGR, (Space Physics), 2008-2012. As part of the duty, reviewed a great number of controversial manuscripts, meaning that the authors and one of the two reviewers have irreconcilable opinions about the manuscript.

- Team member of NASA Magnetospheric Constellation Science and Technology Definition Team. One of the Team's responsibilities is to determine a set of compelling science objectives and an orbital strategy for the magnetospheric constellation mission, which will consist of 30 to 80 Nano-satellites to investigate various aspects of magnetospheric dynamics.

- Team member on NASA/LWS/RBSP "Tiger Team", a splinter group to do focused work on providing an objective set of criteria (based on mapping to the Radiation Belt science objectives and approaches used to bring closure to those objectives) for deciding what the RBSP orbit should be. Weekly telecon and "homework assignments" for over a month (May-June of 2007).

- Served as the Co-chair of the organization committee for the 2nd International Space Weather Conference, Oct 17-21, 2009, Nanjing, China, and delivered the conference closing speech.

- Served on NASA/Geospace Proposal Review Panel, 2009.

- Served on Program Committee for THEMIS Science Workshop held at LASP, 23-25 March 2009.

- Co-convened the Inner Magnetosphere Session in Joint CLUSTER/THEMIS workshop, at University of New Hampshire, Sept 22-26, 2008.

- Lead-convenor for a special session entitled: Storm-dependent Inner Magnetospheric Dynamics, in 2008 Asian Oceanic Geophysical Society Assembly.

- Served in review panel for NSF National Space Weather Program in 2007.

- Co-convened a special session: Acceleration of Radiation Belt Electrons: Inward Radial Transport vs. in situ Energization, for Fall American Geophysical Union (AGU) meeting, 5-10 December 2005.

- Co-convened a special session: Responses of Earth's space environment to Solar Events, in Global Chinese Aerospace Weather Science Meeting, Macau, 21-25 November 2005.

- Co-convened a special session: Magnetospheric Response to Extreme Solar Events, in AOGS (Asia Oceania Geosciences Society) annual meeting, Singapore, 20-24 June 2005.

- Served on NASA/SEC/Solar Terrestrial Probe/Magnetospheric Constellation Science and Technology Study and Definition Team, 1999-2004.

- Served as study scientist (with John Wygant) in 2004 for NASA/SEC/Road Map/Inner Magnetospheric Constellation Mission. In collaboration with NASA engineers, we investigated a range of possible mission configurations to satisfy cost cap (\$300M).

- Served on student-paper evaluation committee of AGU (2003, 2004, 2008).

Reviewer for:

NASA Sun-Earth Connection/Guest Investigator/Living With a Star proposals

NASA/SR&T proposals

National Science Foundation Base Program and Geophysical Environment Modeling proposals

National Space Weather Program

Journal of Geophysical Research – Space Physics

Journal of Geophysical Research – Atmospheric Physics

Journal of Atmospheric and Solar-Terrestrial Physics

Geophysical Research Letters

Annales Geophysicae

Earth, Planets and Space

Science of China

Advanced Geophysics

Advanced Plasma Physics

One chapter in book: Jupiter - The Planet, Satellites and Magnetosphere.

Reviewed and proof-read two chapters of Space Weather classnotes of Prof. Knipp of Air Force Academy in 2006.

Service to the University

- Served on the Campus Transportation Committee, which met 5 times and completed its final report to the Provost, 2010.
- Participated in a meeting on 1/27/06 about Provost initiative in international education, focusing on enhancing CU's visibility in China and recruiting good graduate students from China.

Service to the College and Graduate School

- Served in Undergraduate Education Council of College of Engineering and Applied Sciences, 2007-2008.
- Participated in a meeting on 9/7/06 hosted by Graduate School Dean (Susan Avery) on China Initiative, enhance collaboration between CU graduate programs and several Chinese Universities.

Service to the Department

- Serve as AERO Graduate Student Committee Chair, 2008.
- Serve on Evaluation Committee of LASP for Dr. Wenlong Liu's promotion from Scientist-I to Scientist-II, 2010.
- Served as AERO K. D. Wood Colloquium Chair in 2009, responsible for inviting appropriate speakers (Prof. Jakosky of LASP and Prof. Harlan Spence of UNH) for speaking at K. D. Wood Colloquium.
- Served on Undergraduate Teaching Curriculum Committee of Dept. of Aerospace Engineering Sciences, 2006-2010.
- Served on the search committee of Senior Instructor of Dept. of Aerospace Engineering Sciences, 2007-2008.
- Served as Evaluation Committee Chair for Dr. Shri Kanekal's promotion from Scientist-II to Scientist-III, 2007-2008.
- Served on AERO graduate student recruit and curricular committee, 2007-2008.
- Participated in two meetings in 2006 and 2007 between LASP and AERO about the Initiative for Hands-On Education and Research (proposed by AERO, led by Lee Peterson). The purpose of the meetings was to make best use of LASP facilities and engineering experience to enhance the training for space for the graduate students. Other participants: Dan Baker, Lee Peterson, Mike McGrath, Scott Palo.

- Served as the formal AERO department representative to the planetary graduate student admissions committee, 2004-2006.

Service to LASP

- Served on the search committee for faculty positions (CCLDAS) at LASP jointed with AERO, APS, and Physics, 2009-2010. The search was successful, both offers were accepted and the candidates will come on board in 2011.
- Served on Evaluation Committee of LASP for Dr. Peter Delamere's promotion from Scientist-II to Scientist-III, 2009.
- Served as the group leader for space physics for the Research Associate (RA) evaluations of LASP in 2007-2008, going through every RA's file and talking in person to every RA in space physics discipline (total 12) and attended meetings with other group leaders and LASP management to decide their merit raise.
- Served as a red-team reviewer on proposal HPAC (Heliophysical Pathways to Atmospheric Coupling), 2007-2008.
- Organized a LASP seminar given by Dr. Paul Graf on Recurring Surprises in PI-led Space Missions, June 1, 2007.
- Served as Evaluation Committee Chair for Dr. Scot Elkington's promotion from Scientist-II to Scientist-III, 2007-2008.
- Served in Evaluation Committee for Dr. Michael Gehmeyr for transfer from the PRA career track to the Research Scientist career track, 2007.
- Served on LASP Executive Committee from 2002-2007.
- Served on promotion committee for T. E. Sarris of LASP to be promoted from Scientist-I to Scientist-II in 2006.
- Organized a series of AERO/LASP technology seminar in 2002. Arranged AERO faculty members: Steve Nerem, Lee Peterson, Penny Axelrad, and Dale Lawrence to give technology seminars to LASP engineers and scientists, also arranged Mike McGrath, director of LASP engineer division, to give a talk at AERO describing 'Instrument and Spacecraft Engineering at LASP' to ASE faculty and students.
- Served on LASP Executive Committee, 2003-2007.
- Serve on LASP Education and Public Out Reach Committee, 2002-2010.
- Served on AERO Graduate Curriculum Committee, 2002-2008.
- Served on LASP graduate student curriculum committee, 2002.
- Served on AERO/LASP Cooperation Committee, 2002-2005.
- Served on promotion committee for two young scientists of LASP to be promoted from Scientist-I to Scientist-II in 2004-2005.
- Served on LASP faculty search committee for the National Science Foundation funded solar and space faculty position in 2005.
- Served as the Chair of promotion committee for a young scientist of LASP to be promoted from Scientist I to Scientist II in 2004.

Outreach Activities:

- Gave a LASP Public Lecture about NASA's THEMIS mission to Boulder public on 4/7/09.
- Gave a general non-technical talk about NASA's THEMIS mission to all LASP employees on 3/2/07.
- In late January of 2007 (before THEMIS' launch), responded to e-mail inquiries and talked on the phone to a freelance journalist, Margaret Putney, for Geotimes doing a story on the THEMIS mission to look at and study the northern lights and particularly discussed the following questions: So what do we know about the northern lights? What don't we know? So are we trying to answer all those questions about what we don't know? Do the lights really disrupt cell phones or is that a myth? Where will this research lead us? What do you personally hope to learn from this mission?
 - Gave a presentation about LASP sciences to a 12-person delegation from the Malaysian Space Agency on 15 Feb 2006.
 - As a scientist guest speaker at Monarch K-8 on 15 September 2005, I discussed with 6th grade students when/how I was intrigued to choose science as my career, what education is needed to become a scientist, what I do at work, and beginning and high end salaries for scientists in general.
 - Wrote a feature article published in EOS newspaper: The Predictability of the Magnetosphere and Space Weather, a feature article in EOS, AGU, Step. 16, 2003. Such a feature article brings more attention to the relevance of Sun-Earth Connection research to other disciplines.
 - Gave a science talk about the solar system to a 3rd grade class in Monarch Public School, Louisville, Colorado, 2003.
 - Discussed solar activities and their consequences on Earth's space environment with Colorado 9 news reporter, Amanda Martin, before she went on TV reporting the Oct-Nov, 2003 solar flares and magnetospheric storm events.
 - Exchanged e-mail discussions with a Science News reporter, Ron, about solar activities and their consequences on Earth's space environment before they published an article about the Oct-Nov. 2003 solar flares and magnetospheric storms.