



Richard M. Thorne
Distinguished Professor of Atmospheric Physics, AOS
PhD in Physics, MIT, 1968

Honors and Grants

- Fellow of the American Geophysical Union, 2000 - present

Grants:

- NASA OPR: NNX07AL27G, 8/1/07 - 7/31/11
- NASA Cassini Data Analysis: NNX08AP80G, 5/12/08 – 5/11/11
- NASA LWS: NNX08AQ88G, 6/27/08 - 6/26/11
- NASA Heliophysics Theory: NNX08A135G, 3/1/08 – 2/28/11
- NSF GEM grant: ATM-0802834, 9/1/08 - 8/31/12

Invited Talks:

- “Recent advances in modeling wave-particle interaction in the magnetosphere, invited talk at the *EMFISIS Science Team Meeting*, Iowa, July 2009.
- “Recent advances in the modeling of precipitation loss from the radiation belts”, Invited talk at the *IAGA 2009 Scientific Assembly*, Sopron, Hungary, August 2009.
- “Modeling the dynamics of the radiation belts: the legacy of Mike Cornwall”, invited talk at the conference on *Quantum Field Theory and Beyond: Celebrating John M Cornwall’s 75th Birthday*, UCLA, November, 2009.

Research Activities Over the Last Year

- Theoretical analysis of the physical mechanisms responsible for Earth's diffuse auroral electron precipitation.
- Simulation of the global excitation of chorus emissions, EMIC waves, and equatorial magnetosonic waves in the Earth's magnetosphere, and their effects on the dynamic evolution of the ring current and radiation belts.
- Analysis of properties of whistler-mode chorus emissions observed on THEMIS, and the relationship of the waves to ambient plasma properties.
- Theoretical simulation of the origin of plasmaspheric hiss, which is primarily responsible for the slot between the inner and outer high-energy electron radiation belts.
- Analysis of the excitation of ECH waves and chorus emissions in the Jovian and Saturnian magnetospheres, and the effect of such waves on the energetic electron population.
- Invited "Frontier" review for *GRL* on "Radiation belt dynamics: Importance of wave-particle interactions"

Teaching and Service

Teaching:

- AOS 205A, Solar System Plasmas, W10
- AOS 250B, Solar System Plasma Physics, F09
- AOS 19, Freshman seminar on Space Weather, F09

Service:

- UCLA Faculty Executive Committee
- AOS Graduate Admission Committee
- Chair of the GEM focus group on “Diffuse Auroral Precipitation”
- JUNO Radiation Board
- NASA OPR review panel
- Theory lead for RBSPECT and EMFISIS instrument teams on the NASA RBSP mission

Publications: 7/1/09 – 6/30/10

- Li, W., R. M. Thorne, V. Angelopoulos, J. Bortnik, C. M. Cully, B. Ni, O. LeContel, A. Roux, U Auster and W. Magnes (2009), Global distribution of whistler-mode chorus observed on the THEMIS spacecraft, *Geophys. Res. Lett.*, **36**, L09104, doi:10.1029/2009GL037595 .
- Meredith, N. P., R. B. Horne, R. M. Thorne, and R. R. Anderson (2009), Survey of upper band chorus and ECH waves: Implications for the diffuse aurora, *J. Geophys. Res.*, **114**, A07218, doi:1029/2009JA14230.
- Chen, L., R. M. Thorne, and R. H. Horne (2009), Simulation of EMIC excitation in a model magnetosphere including structured high-density plumes, *J. Geophys. Res.*, **114**, A07221, doi:10.1029/2009JA014204.
- Mauk, B. H., D. C. Hamilton, T. W. Hill, G. B. Hospodarsky, R. E. Johnson, C. Paranicas, E. Roussos, C. T. Russell, D. E. Shemansky, E. C. Sittler, and R. M. Thorne (2009), Fundamental plasma processes in Saturn's magnetosphere, in *Saturn from Cassini Huygens*, edited by M. K. Dougherty, L. W. Esposito and S. M. Krimigis, pp 281-331, Springer.
- Ni, B., Y. Shprits, R. Thorne, R. Friedel, and T. Nagai (2009). Reanalysis of relativistic radiation belt electron phase space density using multi-satellite observations: Sensitivity to empirical magnetic field models, *J. Geophys. Res.*, **114**, A12208, doi:10.1029/2009JA014438.
- Summers, D., R. Tang, and R. M. Thorne (2009), Limit on stably trapped particle flux in planetary magnetospheres, *J. Geophys. Res.*, **114**, A10210, doi:10.1029/2009JA014428.
- Chen, L., J. Bortnik, R. M. Thorne, R. B. Horne, and V. K. Jordanova (2009), Three-dimensional ray tracing of VLF waves in an asymmetric magnetospheric environment containing a plasmaspheric plume, *Geophys. Res. Lett.*, **36**, L22101, doi:10.1029/2009GL040451.
- Li, W., R. M. Thorne, Y. Nishimura, J. Bortnik, V. Angelopoulos, J. P. McFadden, D. E. Larsen, J. W. Bonnell, O. LeContel, A. Roux, K. H. Glassmeier, and U Auster (2010), THEMIS analysis of observed electron distributions responsible for chorus excitation, *J. Geophys. Res.*, **115**, A00F11, doi:10.1029/2009JA014845.
- Jordanova, V. K., R. M. Thorne, W. Li, and Y. Miyoshi (2010), Excitation of whistler-mode chorus from global ring current simulations, *J. Geophys. Res.*, **115**, A00F10, doi:10.1029/2009JA014810.
- Ukhorskiy, A. Y. Y. Shprits, B. J. Anderson, K. Takahashi, and R. M. Thorne (2010), Rapid scattering of radiation belt electrons by storm-time EMIC waves, *Geophys. Res. Lett.*, **37**, L09101, doi:10.1029/2010GL042906.