
ROBERT C. ALLEN, PH.D.

PROFILE



My research interests lie in space plasma phenomena. This includes particle acceleration in the solar wind, interactions between the solar wind and planetary magnetospheres and surfaces, sources and evolution of magnetospheric plasma, wave-particle interactions, and space flight instrumentation. Experience includes comprehensive studies of solar wind-originating plasma injection and subsequent evolution in the magnetospheres of Earth and Saturn, investigations on EMIC wave generation and propagation in the Earth's outer magnetosphere, particle acceleration in stream interaction regions, as well as space flight instrumentation and calibration.

EDUCATION

UNIVERSITY OF TEXAS, SAN ANTONIO – PH.D. PHYSICS, 2017

UNIVERSITY OF TEXAS, ARLINGTON – B.S. PHYSICS WITH MINOR IN MATHEMATICS, 2011

CISM SUMMER SCHOOL – NCAR, 2012

EXPERIENCE

SENIOR PROFESSIONAL STAFF I, JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY – 2019 - PRESENT

Research topics include particle acceleration at stream interaction regions in the solar wind with Parker Solar Probe, Solar Orbiter, ACE, Wind, and STEREO; solar wind entry into the magnetosphere of Saturn through magnetic reconnection and Kelvin-Helmholtz interactions along the magnetospheric flanks using Cassini observations; and investigating the generation and propagation of outer magnetospheric EMIC waves at Earth. Responsibilities also include my role as Instrument Scientist for the Suprathermal Ion Spectrograph (SIS) sensor on Solar Orbiter, aiding the Parker Solar Probe (PSP) Project Science Team, and serving as an organizing member for the Whole Heliosphere and Planetary Interactions (WHPI) campaign for the 4th and 7th perihelia of PSP and hosting the WHPI Web Colloquia.

POST-DOCTORAL FELLOW, JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY – 2017 - 2019

Research topics included investigation of the energetic ion charge state composition in the magnetosphere of Saturn, as well as determining the ion-charge state composition in the outer magnetospheric regions of Jupiter, using Cassini data. Additional tasks include preparing for Parker Solar Probe and Solar Orbiter by investigating solar energetic particle composition associated with stream interaction regions using data from the Advanced Composition Explorer.

GENERAL ASSOCIATE, NASA GODDARD PLANETARY HELIOPHYSICS INSTITUTE - UNIVERSITY
OF MARYLAND, BALTIMORE COUNTY – 2017 - 2017

This research involved Investigating oxygen ion charge state composition in the magnetosphere, cusp, and magnetosheath regions of Earth with Polar observations. Using this information, efforts are being made to characterize soft x-ray emissions from these regions to predict signal-to-noise ratios for future instrument designs.

GRADUATE RESEARCH ASSISTANT, SOUTHWEST RESEARCH INSTITUTE - UNIVERSITY OF
TEXAS, SAN ANTONIO – 2014 - 2017

Investigating the penetration processes and subsequent evolution of solar wind-originating oxygen ions in the magnetospheres of Earth and Saturn, along with a comparison to internal sources of oxygen. Additional work includes the continuation of investigations into the magnetic latitude dependence of electromagnetic ion cyclotron (EMIC) waves and wave-particle interactions at reconnection sites. Modeling and calibration of the Heavy Ion Sensor (HIS) instrument onboard Solar Orbiter. Further calibration of the Solar Wind Around Pluto (SWAP) engineering model to better understand and expand the data products of the flight SWAP instrument onboard New Horizons. Additional work includes SIMION design work for a proposal to the Europa Mission, fabrication of various lab equipment and wiring for calibration of flight hardware, as well as the development of LabVIEW routines to interface with lab hardware.

RESEARCH ASSISTANT, UNIVERSITY OF NEW HAMPSHIRE – 2011 - 2013

Investigated the location, causes, and impacts of EMIC waves in the Earth's magnetosphere as a function of magnetic local time and magnetic latitude. Developed a software package to read in situ Cluster and Van Allen Probes magnetometer and electric field data to generate spectrograms of various wave properties and characteristics, accompanied with local plasma data, solar wind, and geomagnetic activity information. This information was used in several case studies as well as statistical studies of the magnetic latitude dependence of various EMIC wave properties and off-equator generation regions due to Shabansky orbits. In addition, ground based magnetometers have been utilized to trace the waves to the ground. Mentored new graduate students and a high school student in the lab to introduce them to space physics research and teach them how to access and employ the various software and data sets used by the group.

UNDERGRADUATE RESEARCH ASSISTANT – 2008 - 2011

Utilized various databases to collect and analyze satellite, magnetometer, and SuperDARN data. Conducted studies on the polar cap environment using various instruments onboard the Defense Meteorological Satellite Program (DMSP) spacecraft. Worked with CISM_DX to analyze Lyon-Fedder-Mobarry (LFM) global magnetohydrodynamics (MHD) simulation results and ran the Weimer-2005 simulation. Additional research included a mathematical investigation of the stability properties of BGK wave solutions to a one dimensional Vlasov-Poisson system. Mentored and supervised newer undergraduate researchers in the lab with their research projects.

PUBLICATION METRICS

First Authored Publications 15	Co-authored Publications 45	Total Publications 60
Number of Citations 748	i-10 index 25	h-index 15

PUBLICATIONS (FIRST-AUTHOR)

1. **Allen, R. C.**, G. C. Ho, G. M. Mason, G. Li, L. K. Jian, S. K. Vines, N. A. Schwadron, C. J. Joyce, S. D. Bale, J. W. Bonnell, A. W. Case, E. R. Christian, C. M. S. Cohen, M. I. Desai, R. Filwett, K. Goetz, P. R. Harvey, M. E. Hill, J. C. Kasper, K. E. Korreck, D. Lario, D. Larson, R. Livi, R. J. MacDowall, D. M. Malaspina, D. J. McComas, R. McNutt, D. G. Mitchell, K. W. Paulson, M. Pulupa, N. Raouafi, M. L. Stevens, P. L. Whittlesey, & M. Wiedenbeck (2021) Radial evolution of a CIR: Observations from a nearly radially aligned event between Parker Solar Probe and STEREO-A, *Geophys. Res. Lett.*, 48, doi: 10.1029/2020GL091376.
2. **Allen, R. C.**, G. M. Mason, G. C. Ho, J. Rodríguez-Pacheco, R. F. Wimmer-Schweingruber, G. B. Andrews, L. Berger, S. Boden, I. Cernuda, F. Espinosa Lara, J. L. Freiherr von Forstner, R. Gómez-Herrero, J. R. Hayes, S. R. Kulkarni, W. J. Lees, C. Martin, D. Pacheco, O. R. Polo, M. Prieto, A. Ravanbakhsh, S. Sánchez-Prieto, C. E. Schlemm, H. Seifert, J. C. Teresa, K. Tyagi, Z. Xu, & M. Yedla (2020), Suprathermal particles from corotating interaction regions during the first perihelion pass of Solar Orbiter, *A&A Letters*, doi: 10.1051/0004-6361/202039870..
3. **Allen, R. C.**, G. C. Ho, L. K. Jian, S. K. Vines, S. D. Bale, A. W. Case, M. E. Hill, C. J. Joyce, J. C. Kasper, K. E. Korreck, D. M. Malaspina, D. J. McComas, R. McNutt, C. Möstl, D. Odstrcil, N. Raouafi, N. A. Schwadron, & M. L. Stevens (2020), A Living Catalog of Stream Interaction Regions in the Parker Solar Probe Era, *A&A*, doi: 10.1051/0004-6361/202039833.
4. **Allen, R. C.**, G. C. Ho, L. K. Jian, G. M. Mason, S. K. Vines, & D. Lario (2020), Predictive Capabilities and Limitations of Stream Interaction Regions Observations at Different Solar Longitudes, *Space Weather*, 18, doi:10.1029/2019SW002437.
5. **Allen, R. C.**, D. Lario, D. Odstrcil, G. C. Ho, L. K. Jian, C. M. S. Cohen, S. T. Badman, S. I. Jones, C. N. Arge, M. L. Mays, G. M. Mason, S. D. Bale, J. W. Bonnell, A. W. Case, E. R. Christian, T. Dundok de Wit, K. Goetz, P. R. Harvey, C. J. Henney, M. E. Hill, J. C. Kasper, K. E. Korreck, D. Larson, R. Livi, R. J. MacDowall, D. M. Malaspina, D. J. McComas, R. McNutt, D. G. Mitchell, M. Pulupa, N. Raouafi, N. Schwadron, M. L. Stevens, P. L. Whittlesey, and M. Wiedenbeck (2020), Solar Wind Streams and Stream Interaction Regions Observed by the Parker Solar Probe with Corresponding Observations at 1 au, *ApJS*, 246, 36, doi: 10.3847/1538-4365/ab578f.
6. **Allen, R. C.**, C. P. Paranicas, F. Bagenal, S. K. Vines, D. C. Hamilton, F. Allegrini, G. Clark, P. A. Delamere, T. K. Kim, S. M. Krimigis, D. G. Mitchell, T. H. Smith, & R. J. Wilson (2019), Energetic oxygen

and sulfur charge states in the outer Jovian magnetosphere: Insights from the Cassini Jupiter flyby, *Geophys. Res. Lett.*, 46, doi:10.1029/2019GL085185.

7. **Allen, R. C.**, G. C. Ho, & G. M. Mason (2019), Suprathermal ion abundance variations in coronating interactions regions over two solar cycles, *ApJL*, 883, doi:10.3847/2041-8213/ab3f2f.
8. **Allen, R. C.**, D. G. Mitchell, C. P. Paranicas, D. C. Hamilton, G. Clark, A. M. Rymer, S. K. Vines, E. C. Roelof, S. M. Krimigis, & J. Vandegriff (2018), Internal versus external sources of plasma at Saturn: Overview from MIMI/CHEMS data, *J. Geophys. Res. Space Physics*, 123, doi:10.1029/2018JA025262.
9. **Allen, R. C.**, S. A. Livi, S. K. Vines, J. Goldstein, I. Cohen, S. A. Fuselier, B. H. Mauk, & H. E. Spence (2017), Storm-time empirical model of O⁺ and O⁶⁺ distributions in the magnetosphere, *J. Geophys. Res. Space Physics*, 122, doi:10.1002/2017JA024245.
10. **Allen, R. C.** (2017), Plasma Source and Evolution in the Global Magnetosphere and Wave Generation in the Outer Magnetosphere, (Order No. 10270397, The University of Texas at San Antonio), *ProQuest Dissertations and Theses*, 242, isbn:9781369775587.
11. **Allen, R. C.**, S. A. Livi, S. K. Vines, & J. Goldstein (2016), Magnetic latitude dependence of oxygen charge states in the global magnetosphere: Insights into solar wind-originating ion injection, *J. Geophys. Res. Space Physics*, 121, doi:10.1002/2016JA022925.
12. **Allen, R. C.**, J.-C. Zhang, L. M. Kistler, H. E. Spence, R.-L. Lin, B. Klecker, M. W. Dunlop, M. André, & V. K. Jordanova (2016), A statistical study of EMIC waves observed by Cluster: 2. Plasma Conditions, *J. Geophys. Res. Space Physics*, 121, doi:10.1002/2016JA022541.
13. **Allen, R. C.**, S. A. Livi, & J. Goldstein (2016), Variations of oxygen charge state abundances in the global magnetosphere, as observed by Polar, *J. Geophys. Res. Space Physics*, 121, doi:10.1002/2015JA021765.
14. **Allen, R. C.**, J.-C. Zhang, L. M. Kistler, H. E. Spence, R.-L. Lin, B. Klecker, M. W. Dunlop, M. André, & V. K. Jordanova (2015), A statistical study of EMIC waves observed by Cluster: 1. Wave Properties, *J. Geophys. Res. Space Physics*, 120, doi:10.1002/2015JA021333.
15. **Allen, R. C.**, J.-C. Zhang, L. M. Kistler, H. E. Spence, R. L. Lin, M. W. Dunlop, & M. André (2013), Multiple bidirectional EMIC waves observed by Cluster at middle magnetic latitudes in the dayside magnetosphere, *J. Geophys. Res. Space Physics*, 118, doi:10.1002/jgra.50600.

PUBLICATIONS (CO-AUTHOR)

1. Mason, G. M., G. C. Ho, **R. C. Allen**, Z. G. Xu, N. P. Janitzek, J. L. Freiherr von Forstner, A. Kohlho, D. Pacheco, J. Rodríguez-Pacheco, R. F. Wimmer-Schweingruber, G. B. Andrews, C. E. Schlemm, H. Seifert, K. Tyagi, W. J. Lees, J. Hayes, R. Gómez-Herrero, M. Prieto, S. Sánchez-Prieto, F. Espinosa Lara, I. Cernuda, P. Parra Espada, O. Rodríguez Polo, A. Martínez Hellín, C. Martin, S. Böttcher, L. Berger, J. C. Terasa, S. Boden, S. R. Kulkarni, A. Ravanbakhsh, M. Yedla, S. Eldrum, R. Elftmann, & P. Kühl (2021), Quiet-time low energy ion spectra observed on Solar Orbiter during solar minimum, *A&A Letters*, doi: 10.1051/0004-6361/202140540.
2. Freiherr von Forstner, J. L., M. Dumbović, C. Möstl, J. Guo, A. Papaioannou, R. Elftmann, Z. Xu, J. Christoph Terasa, A. Kollhoff, R. F. Wimmer-Schweingruber, J. Rodríguez-Pacheco, A. J. Weiss, J. Hinterreiter, T. Amerstorfer, M. Bauer, A. V. Belov, M. A. Abunina, T. Horbury, E. E. Davies, H. O'Brien, **R. C. Allen**, G. Bruce Andrews, L. Berger, S. Boden, I. C. Cangas, F. Espinosa Lara, R. G. Herrero, J. Hayes, G. C. Ho, S. R. Kulkarni, W. J. Lees, C. Martín, G. M. Mason, D. Pacheco, M. Prieto Mateo, A. Ravanbakhsh, O. Rodríguez Polo, S. Sánchez Prieto, C. E. Schlemm, H. Seifert, K. Tyagi, & M. Yedla (2021), Radial evolution of the April 2020 stealth coronal mass ejection between 0.8 and 1 au: A comparison of Forbush decreases at Solar Orbiter and Earth, *A&A*, doi: 10.1051/0004-6361/202039848.
3. Vines, S. K., B. J. Anderson, **R. C. Allen**, R. E. Denton, M. J. Engebretson, J. R. Johnson, S. Toledo-Redondo, J. H. Lee, D. L. Turner, R. E. Ergun, R. J. Strangeway, C. T. Russell, H. Wei, R. B. Torbert, S. A. Fuselier, B. L. Giles, & J. L. Burch (2021) Determining EMIC wave vector properties through multi-point measurements: The wave curl analysis, *J. Geophys. Res. Space Physics*, 126, doi: 10.1029/2020JA028922.
4. Gómez-Herrero, R., D. Pacheco, A. Kollhoff, F. Espinosa Lara, J. L. Freiherr von Forstner, N. Dresing, D. Lario, L. Balmaceda, V. Krupar, O. E. Malandraki, A. Aran, R. Bučik, A. Klassen, K.-L. Klein, I. Cernuda, S. Eldrum, H. Reid, J. G. Mitchell, G. M. Mason, G. C. Ho, J. Rodríguez-Pacheco, R. F. Wimmer-Schweingruber, B. Hever, L. Berger, **R. C. Allen**, N. P. Janitzek, M. Laurenza, R. de Marco, N. Wijzen, Y. Y. Kartavykh, W. Dröge, T. S. Horbury, M. Maksimovic, C. J. Owen, A. Vecchio, X. Bonnin, O. Kruparova, D. Piša, J. Souček, P. Louarn, A. Fedorov, H. O'Brien, V. Evans, V. Angelini, P. Zucca, M. Prieto-Mateo, S. Sánchez-Prieto, A. Carroscio, J. J. Blanco, P. Parra, O. Rodríguez-Polo, C. Martín, J. C. Terasa, S. Bolden, S. R. Kulkarni, A. Ravanbakhsh, M. Yedla, Z. Xu, G. B. Andrews, C. E. Schlemm, H. Seifert, K. Tyagi, W. J. Lees, & J. Hayes (2021) First-near relativistic solar electron events observed by EPD onboard Solar Orbiter, *A&A*, doi: 10.1051/0004-6361/202039883.
5. Mason, G. M., G. C. Ho, **R. C. Allen**, J. Rodríguez-Pacheco, R. F. Wimmer-Schweingruber, R. Bučik, R. Gómez-Herrero, D. Lario, J. L. F. von Forstner, G. B. Andrews, L. Berger, I. Cernuda, F. Espinosa Lara, E. J. Lees, C. Martin, D. Pacheco, M. Prieto, S. Sánchez-Prieto, J. R. Hayes, C. E. Schlemm, H. Seifert, &

- K. Tyagi (2020), 3He-rich Solar Energetic Particle Events Observed on the First Perihelion Pass of Solar Orbiter, *A&A Letters*, doi: 10.1051/0004-6361/202039752.
6. Wilson, R. J., D. B. Reisenfeld, P. A. Delamere, **R. C. Allen**, & T. A. Cassidy (2020), Revisiting Magnetospheric CAPS TOF Data Post Cassini, *Icarus*, doi: 10.1016/j.icarus.2020.114245.
 7. Liou, K., C. Paranicas, S. K. Vines, P. Kollmann, **R. C. Allen**, G. B. Clark, D. G. Mitchell, J. C. M. Jackman, A. Masters, N. Achileos, E. Roussos, & N. Krupp (2020), Dawn-Dusk Asymmetry in Energetic (>20 keV) Particles Adjacent to Saturn's Magnetopause, *J. Geophys. Res. Space Physics*, doi: 10.1029/2020JA028264.
 8. Schwadron, N. A., C. J. Joyce, A. Aly, C. M. S. Cohen, M. I. Desai, D. J. McComas, J. T. Niehof, E. Möbius, M. Lee, J. Bower, S. Bale, A. Case, E. R. Christian, A. J. Davis, W. de Wet, K. Goetz, J. Giacalone, M. E. Hill, **R. C. Allen**, J. C. Kasper, K. Korreck, R. A. Leske, O. Malandraki, W. H. Matthaeus, R. L. McNutt Jr, R. A. Mewaldt, D. G. Mitchell, M. Pulupa, J. S. Rankin, E. C. Roelof, E. C. Stone, J. R. Szalay, & M. E. Wiedenbeck (2020), A New View of Energetic Particles from Stream Interaction Regions Observed by Parker Solar Probe, *A&A*, doi: 10.1051/0004-6361/202039352.
 9. Lee, J. H., D. L. Turner, S. K. Vines, **R. C. Allen**, S. Toledo-Redondo, S. T. Bingham, S. A. Fuselier, I. J. Cohen, M. J. Starkey, D. B. Graham, Y. V. Khotyaintsev, B. H. Mauk, C. J. Pollock, R. E. Ergun, P.-A. Lindqvist, R. B. Torbert, & J. L. Burch (2020), Application of Cold and Hot Plasma Composition Measurements to Investigate Impacts on Dusk-Side Electromagnetic Ion Cyclotron Waves, *J. Geophys. Res. Space Physics*, doi: 10.1029/2020JA028650.
 10. Kronberg, E. A., F. Gastaldello, S. Haaland, A. Smirnov, M. Berrendorf, S. Ghizzardi, K. D. Kuntz, N. Sivadas, **R. C. Allen**, A. Tiengo, R. Ilie, Y. Huang, & L. Kistler (2020), Prediction and Understanding of Soft Proton Contamination in XMM-Newton: A Machine Learning Approach, *ApJ*, 903, doi: 10.3847/1538-4357/abbb8f.
 11. Hill, M. E., **R. C. Allen**, P. Kollmann, L. E. Brown, R. B. Decker, R. L. McNutt Jr., S. M. Krimigis, G. B. Andrews, F. Bagenal, G. Clark, H. A. Elliott, S. E. Jaskulek, M. B. Kusterer, R. A. Leske, C. M. Lisse, R. A. Mewaldt, K. S. Nelson, J. D. Richardson, G. Romeo, N. A. Salazar, J. D. Vandegriff, E. A. Bernardoni, G. R. Gladstone, M. Horanyi, I. R. Linscott, K. N. Singer, A. J. Steffl, M. E. Summers, H. B. Throop, L. A. Young, C. B. Olkin, J. W. Parker, J. R. Spencer, S. A. Stern, A. J. Verbiscer, & H. A. Weaver (2020), Influence of Solar Disturbances on Galactic Cosmic Rays in the Solar Wind, Heliosphere, and Local Interstellar Medium: Advanced Composition Explorer, New Horizons, and Voyager Observations, *ApJ*, doi: 10.3847/1538-4357/abb408.
 12. Lario, D. L., Balmaceda, N. Alzate, M. L. Mayes, I. G. Richardson, **R. C. Allen**, M. Florido-Llinas, T. Nieves-Chinchilla, A. Koval, N. Lugaz, L. K. Jian, C. N. Arge, P. J. Macneice, D. Odstrcil, H. Morgan, A. Szabo, M. I. Desai, P. L. Whittlesdey, M. L. Stevens, G. C. Ho, & J. G. Luhmann (2020), The Streamer

Blowout Origin of a Flux Rope and Energetic Particle Event Observed by Parker Solar Probe at 0.5 au, *ApJ*, 897, doi: 10.3847/1538-4357/ab9942.

13. Clark, G., B. Mauk, P. Kollmann, C. Paranicas, F. Bagenal, **R. C. Allen**, S. Bingham, S. Bolton, I. Cohen, R. Ebert, W. Dunn, D. Haggerty, S. Houston, C. Jackman, E. Roussos, A. Rymer, and J. Westlake (2020), Heavy ion charge states in Jupiter's polar magnetosphere inferred from auroral megavolt electric potentials, *J. Geophys. Res. Space Physics*, doi: 10.1029/2020JA028052.
14. Kollmann, P., I. Cohen, **R. C. Allen**, G. Clark, E. Roussos, S. Vines, W. Dietrich, J. Wicht, I. De Pater, K. D. Runyon, R. Cartwright, A. Masters, D. Brain, K. Hibbits, B. Mauk, M. Gkioulidou, A. Rymer, R. McNutt Jr., S. Stanley, and P. Bandt (2020), Magnetospheric Studies: A Requirement for Addressing Interdisciplinary Mysteries in the Ice Giant Systems, *Space Sci Rev.*, 216, doi:10.1007/s11214-020-00696-5
15. Cohen, C. M. S., E. R. Christian, A. C. Cummings, A. J. Davis, M. I. Desai, J. Giacalone, M. E. Hill, C. J. Joyce, A. W. Labrador, R. A. Leske, W. H. Matthaeus, D. J. McComas, R. L. McNutt Jr., R. A. Mewaldt, D. G. Mitchell, J. S. Rankin, E. C. Roelof, N. A. Schwadron, E. C. Stone, J. R. Szalay, M. E. Wiedenbeck, **R. C. Allen**, G. C. Ho, J. K. Jian, D. Lario, D. Odstrcil, S. D. Bale, S. T. Badman, M. Pulupa, R. J. MacDowall, J. C. Kasper, A. W. Case, K. E. Korreck, D. E. Larson, R. Livi, M. L. Stevens, and P. Whittlesey (2020), Energetic Particle Increases Associated with Stream Interaction Regions, *ApJS*, 246, 36, doi:10.3847/1538-4365/ab4c38.
16. Desai, M. I., D. G. Mitchell, J. R. Szalay, R. C. Roelof, J. Giacalone, M. E. Hill, D. J. McComas, E. R. Christian, N. A. Schwadron, R. L. McNutt Jr., M. E. Wiedenbeck, C. Joyce, C. M. S. Cohen, R. W. Ebert, M. A. Dayeh, **R. C. Allen**, A. J. Davis, S. M. Krimigis, R. A. Leske, W. H. Matthaeus, O. Malandraki, R. A. Mewaldt, A. Labrador, E. C. Stone, S. D. Bale, M. Pulupa, R. J. MacDowall, and J. C. Kasper (2020), Properties of Suprathermal-through-energetic He Ions Associated with Stream Interaction Regions Observed over the Parker Solar Probe's First Two Orbits, *ApJS*, 246, 36, doi: 10.3847/1538-4365/ab65ef.
17. Giacalone, J., D. G. Mitchell, **R. C. Allen**, M. E. Hill, R. L. McNutt Jr., J. R. Szalay, M. I. Desai, A. P. Rouillard, A. Kouloumvakos, D. J. Mitchell, E. R. Christian, N. A. Schwadron, M. E. Wiedenbeck, S. Bale, L. E. Brown, A. Case, X. Chen, C. M. S. Cohen, C. Joyce, J. C. Kasper, K. G. Klein, K. Korreck, D. E. Larson, R. Livi, R. A. Leske, R. J. MacDowall, M. H. Matthaeus, R. A. Mewaldt, T. Nieves-Chinchilla, M. Pulupa, E. C. Roelof, M. L. Stevens, A. Szabo, and P. L. Whittlesey (2020), Solar Energetic Particles Produced by a Slow Coronal Mass Ejection at ~0.25 au, *ApJS*, 246, 36, doi: 10.3847/1538-4365/ab5221.
18. Mitchell, D. G., J. Giacalone, **R. C. Allen**, M. E. Hill, R. L. McNutt, D. J. McComas, J. R. Szalay, N. A. Schwadron, A. P. Rouillard, S. B. Bale, C. C. Chaston, M. P. Pulupa, P. L. Whittlesey, J. C. Kasper, R. J. MacDowall, E. R. Christian, M. E. Wiedenbeck, and M. H. Matthaeus (2020), CME-associated

Energetic Ions at 0.23 au: Consideration of the Auroral Pressure Cooker Mechanism Operating in the Low Corona as a Possible Energization Process, *ApJS*, 246, 36, doi: 10.3847/1538-4365/ab63cc.

19. Leske, R. A., E. R. Christian, C. M. S. Cohen, A. C. Cummings, A. J. Davis, M. I. Desai, J. Giacalone, M. E. Hill, C. J. Joyce, S. M. Krimigis, A. W. Labrador, O. Malandraki, W. H. Matthaeus, D. J. McComas, R. L. McNutt Jr., R. A. Mewaldt, D. G. Mitchell, A. Posner, J. S. Rankin, E. C. Roelof, N. A. Schwadron, E. C. Stone, J. R. Szalay, M. E. Wiedenbeck, A. Vourlidas, S. D. Bale, R. J. MacDowall, M. Pulupa, J. C. Kasper, **R. C. Allen**, A. W. Case, K. E. Korreck, R. Livi, M. L. Stevens, P. Whitlesey, and B. Poduval (2020), Observations of the 2019 April 4 Solar Energetic Particle Event at the Parker Solar Probe, *ApJS*, 246, 36, doi: 10.3847/1538-4365/ab5712.
20. Hill, M. E., D. G. Mitchell, **R. C. Allen**, G. A. de Nolfo, A. Vourlidas, L. E. Brown, S. I. Jones, D. J. McComas, R. L. McNutt Jr., J. G. Mitchell, J. R. Szalay, S. Wallace, C. N. Arge, E. R. Christian, C. M. S. Cohen, A. B. Crew, M. I. Desai, J. Giacalone, C. J. Henney, C. J. Joyce, S. M. Krimigis, R. A. Leske, R. A. Mewaldt, K. S. Nelson, E. C. Roelof, N. A. Schwadron, and M. E. Wiedenbeck (2020), Small, Low-energy, Dispersive Solar Energetic Particle Events Observed by Parker Solar Probe, *ApJS*, 246, 36, doi: 10.3847/1538-4365/ab643d.
21. Paranicas, C., B. H. Mauk, D. K. Haggerty, G. Clark, P. Kollmann, A. M. Rymer, J. Westlake, **R. C. Allen**, J. Szalay, R. W. Ebert, A. H. Sulaiman, M. Imai, E. Roussos, N. Krupp, Q. Nénon, F. Bagenal, S. Bolton (2019), Io's effect on energetic charged particles as seen in Juno data, *Geophys. Res. Lett.*, 46, doi: 10.1029/2019GL085393.
22. Lee, J. H., D. L. Turner, S. Toledo-Redondo, S. K. Vines, **R. C. Allen**, S. A. Fuselier, Y. V. Khotyaintsev, I. J. Cohen, B. J. Mauk, C. T. Russell, C. J. Pollock, R. E. Ergun, P. L. Lindqvist, and J. L. Burch (2019), MMS Measurements and Modeling of Peculiar Electromagnetic Ion Cyclotron Waves, *Geophys. Res. Lett.*, 46, doi: 10.1029/2019GL085182.
23. Kollmann, P., M. E. Hill, **R. C. Allen**, et al. (2019), Pluto's interaction with energetic heliospheric ions, *J. Geophys. Res. Space Physics*, 124, doi:10.1029/2019JA026830.
24. Sorathia, K. A., V. G. Merkin, A. Y. Ukhorskiy, **R. C. Allen**, N. Nykyri, & S. Wing (2019), Solar wind ion entry into the magnetosphere during northward IMF, *J. Geophys. Res. Space Physics*, 124, doi:10.1029/2019JA026728.
25. Vines, S. K., **R. C. Allen**, B. J. Anderson, M. J. Engebretson, S. A. Fuselier, C. T. Russell, R. J. Strangeway, R. E. Ergun, P.-A. Lindqvist, R. B. Torbert, & J. L. Burch (2019), EMIC waves in the outer magnetosphere: Observations of an off-equator source region, *Geophys. Res. Lett.*, 46, doi:10.1029/2019GL082152.
26. Burch, J. L., K. Dokgo, K. J. Hwang, R. B. Torbert, D. B. Graham, J. M. Webster, R. E. Ergun, B. L. Giles, **R. C. Allen**, L.-J. Chen, S. Wang, K. J. Genestreti, C. T. Russell, R. J. Strangeway, & O. Le Contel

- (2019), High-frequency wave generation in magnetotail reconnection: Linear dispersion analysis, *Geophys. Res. Lett.*, 46, doi:10.1029/2019GL082471.
27. Kollmann, P., M. E. Hill, R. L. McNutt, L. E. Brown, **R. C. Allen**, et al. (2019), Suprathermal ions in the outer heliosphere, *ApJ*, 876, doi:10.3847/1538-4357/ab125f.
28. Ho, G. C., G. Mason, & **R. C. Allen** (2019), 3He-rich solar energetic particle events with no measurable 4He intensity increases, *Solar Phys.*, 294, doi:10.1007/s11207-019-1420-z.
29. Engebretson, M. J., J. L. Posch, N. S. S. Capman, N. G. Campuzano, P. Belik, **R. C. Allen**, S. K. Vines, B. J. Anderson, S. Tian, C. A. Cattell, J. R. Wygant, S. A. Fuselier, M. R. Argall, M. R. Lessard, R. B. Torbert, M. B. Moldwin, M. D. Hartner, H. Kim, C. T. Russell, C. A. Kletzing, G. D. Reeves, & H. J. Singer (2018), MMS, Van Allen Probes, GOES 13, and ground-based magnetometer observations of EMIC wave events before, during, and after a modest interplanetary shock, *J. Geophys. Res. Space Physics*, 123, doi:10.1029/2018JA025984.
30. Sibeck, D. G., **R. C. Allen**, et al. (2018), Imaging plasma density structures in the soft X-rays generated by solar wind charge exchange with neutrals, *Space Sci. Rev.*, 214, doi:10.1007/s11214-018-0504-7.
31. Webster, J. M., J. L. Burch, P. H. Reiff, A. G. Daou, K. J. Genestreti, D. B. Graham, R. B. Torbert, R. E. Ergun, S. Y. Sazykin, A. Marshall, **R. C. Allen**, et al. (2018), Magnetospheric Multiscale Dayside Reconnection Electron Diffusion Region Events, *J. Geophys. Res. Space Physics*, 123, doi:10.1029/2018JA025245.
32. Burch, J. L., R. E. Ergun, P. A. Cassak, J. M. Webster, R. B. Torbert, B. L. Giles, J. C. Dorelli, A. C. Rager, K.-J. Hwang, T. D. Phan, K. J. Genestreti, **R. C. Allen**, et al. (2018), Localized Oscillatory Energy Conversion in Magnetopause Reconnection, *Geophys. Res. Lett.*, 45, doi:10.1002/2017GL076809.
33. Burch, J. L., J. M. Webster, K. J. Genestreti, R. B. Torbert, B. L. Giles, S. A. Fuselier, J. C. Dorelli, A. C. Rager, T. D. Phan, **R. C. Allen**, et al. (2018), Wave Phenomena and Beam-Plasma Interactions at the Magnetopause Reconnection Region, *J. Geophys. Res. Space Physics*, 123, doi:10.1002/2017JA024789.
34. Turner, D. L., J. H. Lee, S. G. Claudepierre, J. F. Fennell, J. B. Blake, A. N. Jaynes, T. Leonard, F. D. Wilder, R. E. Ergun, D. N. Baker, I. J. Cohen, B. H. Mauk, R. J. Strangeway, D. P. Hartley, C. A. Kletzing, H. Breuillard, O. Le Contel, Yu. V. Khotyaintsev, R. B. Torbert, **R. C. Allen**, J. L. Burch, & O. Santolik (2017), Examining coherency scales, substructure, and propagation of whistler-mode chorus elements with Magnetospheric Multiscale (MMS), *J. Geophys. Res. Space Physics*, 122, doi:10.1002/2017JA024474.

35. Genestreti, K. J., J. L. Burch, P. A. Cassak, R. B. Torbert, R. E. Ergun, A. Varsani, T. D. Phan, B. L. Giles, C. T. Russell, S. Wang, M. Akhavan-Tafti, & **R. C. Allen** (2017), The effect of a guide field on energy conversion during asymmetric magnetic reconnection, *J. Geophys. Res. Space Physics*, 122, doi:10.1002/2017JA024247.
36. Vines, S. K., S. A. Fuselier, K. J. Trattner, J. L. Burch, **R. C. Allen**, S. M. Petrinec, J. M. Webster, R. E. Ergun, B. L. Giles, P.-A. Lindqvist, & C. T. Russell (2017), Magnetospheric ion evolution across the low-latitude boundary layer separatrix, *J. Geophys. Res. Space Physics*, 122, doi:10.1002/2017JA024061.
37. Cohen, I. J., D. G. Mitchell, L. M. Kistler, B. H. Mauk, B. J. Anderson, J. H. Westlake, S. Ohtani, D. C. Hamilton, D. L. Turner, J. B. Blake, J. F. Fennell, A. N. Jaynes, T. W. Leonard, A. Gerrard, L. J. Lanzerotti, **R. C. Allen**, & J. L. Burch (2017), Dominance of high energy (> 150 keV) heavy ion intensities in Earth's middle to outer magnetosphere, *J. Geophys. Res. Space Physics*, 122, doi:10.1002/2017JA024351.
38. Vines, S. K., S. A. Fuselier, S. M. Petrinec, K. J. Trattner, & **R. C. Allen** (2017), Occurrence frequency and location of magnetic islands at the dayside magnetopause, *J. Geophys. Res. Space Physics*, 122, doi:10.1002/2016JA023524.
39. Wang X. Y., S. Y. Huang, **R. C. Allen**, H. M. Li, H. S. Fu, X. H. Deng, M. Zhou, J. L. Burch, & R. B. Torbert (2017), The occurrence and wave properties of EMIC waves observed by Magnetospheric Multiscale (MMS) mission, *J. Geophys. Res. Space Physics*, 122, doi:10.1002/2017JA024237.
40. Saikin, A. A., J.-C. Zhang, **R. C. Allen**, C. M. Smither, L. M. Kistler, H. E. Spence, R. B. Torbert, C. A. Kletzing, & V. K. Jordanova (2015), The occurrence, spatial distribution, and wave properties of H⁺-, He⁺-, and O⁺-band EMIC waves observed by the Van Allen Probes, *J. Geophys. Res. Space Physics*, 120, doi:10.1002/2015JA021358.
41. Pankavich, S. & **R. C. Allen** (2014), Instability conditions for some periodic BGK waves in the Vlasov-Poisson system, *Eur. Phys. J. D*, 68, doi:10.1140/epjd/e2014-50170-y.
42. Zhang J.-C., A. A. Saikin, L. M. Kistler, C. W. Smith, H. E. Spence, C. G. Mouikis, R. B. Torbert, B. A. Larsen, G. D. Reeves, R. M. Skoug, H. O. Funsten, W. S. Kurth, C. A. Kletzing, **R. C. Allen**, & V. K. Jordanova (2014), Excitation of EMIC waves detected by the Van Allen Probes on 28 April 2013, *Geophys. Res. Lett.*, 41, doi: 10.1002/2014GL060621.
43. R.-L. Lin, J.-C. Zhang, **R. C. Allen**, L. M. Kistler, C. G. Mouikis, J.-C. Gong, S.-Q. Liu, L.-Q. Shi, B. Klecker, J.-A. Sauvaud, & M. W. Dunlop (2014), Testing linear theory of EMIC waves in the inner magnetosphere: Cluster observations, *J. Geophys. Res. Space Physics*, 119, doi:10.1002/2013JA019541.

44. Huang, Y., Y. Deng, J. Lei, A. Ridley, R. E. Lopez, **R. C. Allen**, & B. Mac Butler (2012), Comparison of Joule heating associated with high speed solar wind between different models and observations, *JA STP*, 75, doi:10.1016/j.jastp.2011.05.013
45. Mitchell, E. J., R. E. Lopez, R. J. Bruntz, M. Wiltberger, J. G. Lyon, **R. C. Allen**, S. J. Cockrell, & P. L. Whitlesey (2010), Saturation of transpolar potential for large Y component interplanetary magnetic field, *J. Geophys. Res. Space Physics*, 115, doi:10.1029/2009JA015119.

PROFESSIONAL SERVICE

2021 onward	Organizing Committee Member	Parker Solar Probes Scholars
2020 onward	Colloquia Organizer and Host	Whole Heliospheric & Planetary Interactions (WHPI) Colloquia Series
2019 onward	Team Member	COSPAR ISWAT Team on Understanding the Suprathermal Seed Population
2018 - 2019	Junior Scientist	ISSI Team - Soft Protons in the Magnetosphere Focused by X-ray Telescopes
2018	Convener: Comparative Plasma Environments Panel Series	Triennial Earth-Sun Summit (TESS), AGU-AAS
2016 - 2017	Anti-Harassment Policy Subcommittee	Geospace Environment Modeling (GEM) Workshop, NSF
2015 - 2017	Graduate Program Recruitment Student Representative	SwRI/UTSA joint Space Physics Graduate Program
2015 - 2017	Writing Club Officer	SwRI/UTSA joint Space Physics Graduate Program
2014 - 2016	Student Representative	Geospace Environment Modeling (GEM) Workshop, NSF
2015 - 2016	Local Organizing Committee Member for 2016 UTSA/SwRI site	Conference for Undergraduate Women in Physics, AIP
2015 - 2016	Physics Outreach Officer	Graduate Society of Physics Students, UTSA
2014 - 2015	Society of Physics Students Liaison	Graduate Society of Physics Students, UTSA

JOURNAL REVIEWER

- Geophysical Research Letters (GRL)
- Journal of Geophysical Research (JGR)
- The Astrophysical Journal (ApJ)
- The Astrophysical Journal Letters (ApJ Letters)
- Astronomy & Astrophysics (A&A)
- Nature Communications
- Frontiers

REVIEW PANEL SERVICE

- NASA LWS Review Panel
- NASA DDAP Review Panel
- NASA CDAP Review Panel

TEACHING EXPERIENCE

- *Lab Instructor at University of New Hampshire*
 - Spring 2012, 1 Section, Intro to Modern Astronomy
- *Lab Instructor at University of Texas, Arlington*
 - Spring 2011, 2 Sections, Astronomy I
 - Spring 2011, 2 Sections, Astronomy II
 - Fall 2010, 3 Sections, Astronomy II
 - Spring 2010, 2 Sections, Astronomy I
 - Spring 2010, 1 Section, Astronomy II
 - Fall 2009, 1 Section, Astronomy I
 - Fall 2009, 1 Section, Astronomy II

SOCIETIES AND MEMBERSHIPS

- American Geophysical Union, joined 2012
- Honor Society of Phi Kappa Phi, inducted 2015
- Alpha Chi Honor Society, inducted 2015
- Golden Key International Honours, inducted 2014
- Sigma Pi Sigma, inducted 2010

MISSIONS AND DATASETS USED

- Advanced Composition Explorer (ACE)
- Cassini
- Cluster
- Defense Meteorological Satellite Program (DMSP)
- Magnetospheric MultiScale (MMS)
- Parker Solar Probe (PSP)
- Polar
- New Horizons
- Solar Orbiter
- Solar Terrestrial Relations Observatory (STEREO)
- Super Dual Auroral Radar Network (SuperDARN)
- Van Allen Probes (Radiation Belt Storm Probes)
- Voyager I & II
- Wind
- XMM-Newton

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