

## CURRICULUM VITAE

Dr. Jakobus A. le Roux  
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## EDUCATION

- 1990. Ph.D. (Cosmic Ray Physics)  
Northwest University, Potchefstroom, South Africa
- 1987. M.Sc. (Cosmic Ray Physics)  
Northwest University, Potchefstroom, South Africa
- 1983. B.Sc. Honours (Atomic and Spectrophysics)  
University of Stellenbosch, Stellenbosch, South Africa
- 1982. B.Sc. (Physics and Mathematics)  
University of Stellenbosch, Stellenbosch, South Africa

## PREVIOUS AND CURRENT ACADEMIC POSITIONS

- *Associate Professor*, Department of Physics & Center of Space Plasma and Aeronomic Research (CSPAR), University of Alabama in Huntsville, Huntsville, AL, 35899, U.S.A., 7/01/2008- .
- *Associate Research Physicist*, Institute of Geophysics and Planetary Physics (IGPP), University of California, Riverside, California, U.S.A., 11/01/2001-06/30/2008
- *Senior Scientist*, Bartol Research Institute, University of Delaware, Newark, Delaware, U.S.A., 06/01/1998-10/31/2001.
- *Assistant Research Scientist*, Institute for Physical Science and Technology, University of Maryland, College Park, Maryland, U.S.A., 11/01/1995-05/31/1998.
- *Research Associate*, Institute for Physical Science and Technology, University of Maryland, College Park, Maryland, U.S.A., 01/01/1991-10/31/1995.
- *Senior Research Assistant*, Department of Physics, Potchefstroom University for C.H.E., South Africa, 1986-1993.
- *Student Assistant*, Department of Physics, Potchefstroom University for C.H.E., South Africa, 1985.

## TEACHING EXPERIENCE

*Department of Physics, Potchefstroom University, South Africa*

- Instructor for 1st and 2nd year physics laboratory sessions from 1985-1990.
- Involved in teaching Special Relativity to 2nd year undergraduate students during 1989.
- Responsible for teaching Cosmic-Ray Physics to graduate students from 1989-1990
- Assistant supervisor, M.Sc. thesis - L.J. Haasbroek. 1994. Title (In Afrikaans, translated as):

Modulation in the Heliosphere: A model study for the Ulysses Mission.

- Assistant supervisor, Ph. D. thesis - L. J. Haasbroek. 1997. Title: Long-term modulation of comic rays in the heliosphere.

*IGPP, University of California (Riverside)*

- Supervisor of postdoctoral scientist Prof. Olga Verkhoglyadova that started her research activities at IGPP from 2003-2005. It involved studying energetic particle diffusion in non-linear 2D MHD vortices, random 2D turbulence and shear Alfvén waves.
- Assisted Prof. Gary P. Zank in teaching part of a course on Plasma Astrophysics during 2004.

***Department of Physics, University of Alabama in Huntsville (2008-2014)***

- PH351, Introduction to Modern Physics, 3<sup>rd</sup> years, Fall 2008
- PH100, Concepts of Physics, 1<sup>st</sup> year non-Physics Majors, Spring 2009, Spring 2010, Spring 2011.
- PH110, Frontiers of Science, 1<sup>st</sup> year Honors Students, Fall 2009
- PH732, Electromagnetic II, Graduate students, Fall 2010, Fall 2011
- PH636, Introduction to Space Plasma Physics, Spring 2012, Spring 2014
- PH113, General Physics with Calculus III, Fall 2012
- PH792, Physics Seminar, Fall 2012, Spring 2013
- PH251, Special Relativity, Spring 2013
- PH 531, Introduction to Plasma Dynamics, Fall 2013
- Supervisor of Edmond B. Smith, M. Sc (non-thesis), 2010
- Supervisor of Edmond B. Smith, potential Ph. D. student , 2010-2011 .
- Undergraduate PH499 Practicum - Garret Sanders and Joe Frazer – advisor for project Entitled “Trajectories Concerning Nominal Circumlunar Hybrid and Hohman Transfer Orbits”, 2011.
- Co-supervisor of undergraduate NSF REU student Nathan Davis, Summer 2012.
- Graduate supervision of Ph. D. student Junye Ye from 2011-2014.
- Graduate supervision of Ph. D. student Aaron Arthur from 2011-2014.
- Postdoctoral supervision of Dr. Fathallah Bibi whose research topic was cosmic-ray transport in intermittent turbulence in the solar wind plasma, 2011-2014.

***Department of Space Science, University of Alabama in Huntsville (2014-2018 )***

- SPA 741, Physics of Cosmic Rays, Fall 2014, Spring 2018
- SPA 624, Space Physics I, Spring 2015, Spring 2016, Spring 2017
- SPA 625, Space Physics II, Fall 2015, Fall 2016
- SPA 522, Introduction to Plasma Physics, Fall 2017
- New courses developed: SPA 625, Space Physics II, and SPA 741, Physics of Cosmic Rays
- Supervisor of Ph. D. student Junye Ye from 2014-2016. Graduated in Fall, 2016. Ph. D. Thesis entitled “A Focused Transport Approach to Interstellar Pickup Ion Acceleration at the Solar Wind Termination shock: The Role of a Fluctuating Magnetic field and Termination Shock Structure.”
- Supervisor of Ph. D. student Aaron Arthur from 2014-2016. Graduated in Spring, 2016. Ph D. Thesis Entitled “Acceleration of Solar Energetic Particles by a Coronal Mass Ejection-Driven Shock in the Corona with Self-Amplified Alfvén Waves
- Co-supervisor of M. Sc. Student Yu Chen with prof. Qiang Hu from 2016-2018. Graduated in Spring 2018. M. Sc. Thesis entitled “Observational Analysis of Small-scale Magnetic Flux Ropes from Ulysses In-situ Measurements”.
- Co-supervisor of undergraduate NSF REU student D. Baptist, Summer 2015.
- Co-supervisor of undergraduate NSF REU student S. Thompson, Summer 2017.
- Graduate Students supported with NASA funding: Junye Ye (Ph. D.) from 2015-2016, Aaron Arthur (Ph. D.) from 2015-2016, Yu Chen (M. Sc.) from 2016-2018.

- Supervisor of undergraduate NSF REU student N. Thompson, Summer 2019.
- Supervisor of Ph. D. student Keaton Van Eck since Summer 2019.
- Served numerous on several Ph. D. and M. Sc. Committees.

## RESEARCH EXPERIENCE

*Research field:* Space Plasma Physics – All aspects of energetic charged particle transport and acceleration in the solar wind plasma.

*Research output:* 73 reviewed papers in internationally recognized scientific journals and 74 reviewed and unreviewed publications in the proceedings of international conferences (see list of publications).

h-index: 31 (Google Scholar)

### *Theoretical Knowledge*

- Kinetic transport theory of energetic charged particles in turbulent electromagnetic fields. Application – solar energetic particle, pickup ion and cosmic-ray transport and acceleration in the solar wind medium.
- Magnetohydrodynamic (MHD) theory of large-scale space plasmas. Application - the large scale solar wind flow and its imbedded magnetic field.
- MHD, quasi-linear kinetic, and weak turbulence kinetic theory of low frequency waves and turbulence. Application - transport of MHD wave energy density in the solar wind, and its generation and damping by energetic particles.

### *Invited Presentations*

1. American Geophysical Union Spring Meeting, Montreal, Canada, May 1992.
2. Space Science Seminar, Department of Physics, University of Potchefstroom for C.H.E., Potchefstroom, South Africa, February 1994.
3. Space Science Seminar, Bartol Research Institute, University of Delaware, Newark, Delaware, October 1994.
4. American Geophysical Union Fall Meeting, San Francisco, California, December 1994.
5. 3D Cosmic Ray Workshop, Bern, Switzerland, September 1996.
6. Workshop - Cosmic Rays in the Heliosphere, Bern, Switzerland, March 1997.
7. American Geophysical Union Fall Meeting, San Francisco, California, December 1997.
8. 32<sup>nd</sup> COSPAR meeting, Nagoya, Japan, July 1998.
9. Solar Wind 9 Conference, Nantucket Island, Massachusetts, October, 1998.
10. Anomalous and Galactic Cosmic Rays in the Heliosphere, Symposium, 1998.
11. Space Science Seminar, Institute for Physical Science and Technology, University of Maryland, Maryland, October 1999.
13. 33rd Assembly Associated COSPAR Colloquium - The Outer Heliosphere: The Next Frontiers, Potsdam, Germany, July 2000.
14. Space Science Seminar, Institute for Physical Science and Technology, University of Maryland, Maryland, December 2000.
15. American Geophysical Union Fall Meeting, San Francisco, CA, USA, December 2000.
16. 1<sup>st</sup> IGPP-UCR International Astrophysics Conference: Particle Acceleration and Transport in Cosmic Plasmas, Riverside, California, February 2002.
17. ACE Team Meeting, Caltech, Pasadena, California, April 2002.
18. 2<sup>nd</sup> IGPP-UCR International Astrophysics Conference: Waves and turbulence in Interplanetary and

- Interstellar Space: Theory, Observations, and Ramifications, Palm Springs, California, February 2003.
19. 3<sup>rd</sup> IGPP-UCR International Astrophysics Conference: Physics of the Outer Heliosphere: Riverside, California, February 2004.
  20. 4<sup>th</sup> IGPP-UCR International Astrophysics Conference: The Physics of Collisionless Shocks: Palm Springs, California, March 2005.
  21. 5<sup>th</sup> IGPP-UCR International Astrophysics Conference: Physics of the Inner Heliosheath: Waikiki Beach, Honolulu, March 2006.
  22. 6<sup>th</sup> IGPP-UCR International Astrophysics Conference: Turbulence, and Nonlinear Processes in Astrophysical Plasmas, Waikiki Beach, Honolulu, March 2007.
  23. Voyagers in the Heliosheath Conference: Observations, Models, and Plasma Physics, Kauai, Hawaii, January, 2009.
  24. *SHINE Meeting*, Nova Scotia, August 3-7, 2009.
  25. Observations and Theories of Suprathermal Tails and Anomalous Cosmic Rays in the Heliosphere and Heliosheath, ISSI Meeting, Bern Switzerland, August 31- September 4, 2009.
  26. International Workshop: New perspectives on cosmic rays in the heliosphere, Parys, South Africa, 22-26 March, 2010.
  27. Energetic Charged Particle Acceleration at the Heliospheric Termination Shock and in the Heliosheath, *COSPAR 38<sup>th</sup> International Assembly*, Bremen, Germany, 18-25 July, 2010.
  28. A Focused Transport Model of the Shock Acceleration of Core Pickup Ions at the Nearly Perpendicular Termination Shock – an update, Observations and Theories of Suprathermal Tails and Anomalous Cosmic Rays in the Heliosphere and Heliosheath, ISSI Meeting, Bern Switzerland, May 25-29, 2010.
  29. A Theory for the Effect of Intermittent Turbulence on Energetic Charged Particle Transport, UAH Workshop, Partially Ionized Plasmas throughout the Cosmos, Nashville, October 3-8, 2010.
  30. le Roux, J. A., A focused Transport Perspective on Time-dependent Solar Energetic Particle Acceleration at a Traveling Shock, *Physics of the Heliosphere: A 10-year Perspective, 10<sup>th</sup> Annual International Astrophysics Conference*, March 13-18, 2011.
  31. le Roux, J. A., Modeling the Acceleration and Transport of Solar Energetic Particles at Traveling Shocks using Focused Transport Theory, *Joint Space Weather Camp 2011*, Rostock, Germany and Huntsville, July 17-August 14, 2011.
  32. le Roux, J. A., Solar Energetic Particle Acceleration at a Fast Traveling Shock, *Workshop: Cosmic Rays and the Heliospheric Plasma Environment*, Bochum, Germany, September 12-16, 2011.
  33. A Focused Transport Model of Solar Energetic Particle Acceleration at a Fast Traveling Shock with Varying Shock Obliquity, *Space Weather: The Space Radiation Environment, Annual International Astrophysics Conference*, March 19-23, 2012.
  34. Acceleration of stellar energetic particles by interplanetary travelling shocks, *WE-Heraeus-Seminar on "Plasma and Radiation Environment in Astrospheres and Implications for the Habitability of Extrasolar Planets*, Physikzentrum Bad Honnef, Germany, 10–15 March, 2013.
  35. le Roux, J. A., 1. Kinetic Theory of Energetic Charged Particle Transport in Tenuous Space Plasmas, 2013 Space Weather Summer School, May 29-June 7, 2013
  36. le Roux, J. A., 2. Application of Kinetic Transport Theory in Space Plasmas: Energetic Charged Particle Acceleration at Collisionless Shocks, *2013 Space Weather Summer School*, Huntsville, May 29-June 7, 2013
  37. le Roux, J. A., Solar Energetic Particles Acceleration at Fast Coronal Mass Ejection Driven Shocks, *12th Annual International Astrophysics Conference*, Myrtle Beach, South Carolina,
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- 15-19 April, 2013.
38. le Roux, J. A., & Zank, G. P., Energetic Charged Particle Acceleration at the Inner Heliosheath Heliospheric Current Sheet, *ISSI Workshop*, Bern, Switzerland, 13-17 January, 2014.
  39. le Roux, J. A., Non-diffusive Energetic Particle Transport in Intermittent Turbulence and at Shocks in the Heliosphere, *ISSI Workshop*, Bern, Switzerland, 10-14 February, 2014.
  40. le Roux, J. A., Zank, G. P., Webb, G. M., Superthermal Charged Particle Transport and Acceleration in Multiple Contracting and Merging Flux Ropes, *ISSI Workshop*, Bern, Switzerland, November, 2014.
  41. le Roux, J. A., Zank, G. P., Webb., Superthermal Ion Transport and Acceleration in Multiple Contracting and Reconnecting Inertial-scale Flux Ropes in the Solar Wind, *56th Annual Meeting of APS Division of Plasma Physics*, October, 2014.
  42. le Roux, J. A., Zank, G. P., Webb., Energetic Charged Particle Transport & Acceleration in Multiple Contracting & Merging (Reconnecting) Inertial-scale Flux Ropes in Supersonic Solar Wind, Seminar, *Northwest University, South Africa*, October, 2014.
  43. le Roux, J. A., Particle Transport in Coherent Structures behind Shocks, *ISSI Workshop*, Bern, Switzerland, November, 2015.
  44. le Roux, J. A., Webb, G. M., Zank, G. P., Suprathermal Particle Acceleration by Small-scale Flux Ropes, *Workshop: New Paradigms for the Heliosphere*, Bad Honnef, Germany, June, 2015.
  45. le Roux, J. A., Zank, G. P., Webb, G. M., "A Kinetic Transport Theory for Energetic Particle Acceleration in Solar Wind Regions with Multiple Contracting and Reconnecting Small-scale Flux Ropes, *14th Annual International Astrophysical Conference*, Tampa Bay, Florida, April, 2015.
  46. le Roux, J. A., G. M. Webb, Zank, G. P., Khabarova, O. V., Diffusive Shock Acceleration Coupled with Downstream Acceleration of Energetic Particles by Small-scale Flux Ropes at Heliospheric shocks, *15th Annual International Astrophysics Conference*, Cape Coral, April, 2016.
  47. le Roux, J. A., Arthur, A. D., Acceleration of Solar Energetic Particles at a Fast Traveling Shock in Nonuniform Coronal Conditions," *16th Annual International Astrophysics Conference*, Santa Fe, New Mexico, March, 2017.
  48. le Roux, J. A., Arthur, A. D., Solar Energetic Particle Acceleration at a Fast Traveling Shock in Typical Highly Nonuniform Coronal Conditions, *Workshop: Astrophysical Processes in the Heliosphere*, Northwest University, Potchefstroom, South Africa, March, 2017.
  49. le Roux, J. A., Zank, G. P., Webb, G. M., Investigation of Different Dynamic Small-scale Flux-rope Acceleration Scenarios near Earth, *17th Annual International Astrophysics Conference*, Santa Fe, New Mexico, 5-9 March, 2018.
  50. le Roux, J. A., Latest Developments in Energetic Particle Acceleration by Contracting and Reconnecting Small-scale Flux-ropes in the Inner Heliosphere, *European Geophysical Union Meeting*, Vienna, Austria, 7-12 April, 2019
  51. le Roux, J. A., Webb, G. M., Khabarova, O. V., Energetic Particle Acceleration and Transport in a Solar Wind Region with Dynamic Small-Scale Flux Ropes at 1 AU, *19th Annual International Astrophysics Conference*, Santa Fe, New Mexico, 5-9 March, 2020.

## GRANTS

### *Principal Investigator*

2015-2018      Title: Particle Acceleration in Inner Heliospheric Regions with Multiple Contracting and Reconnecting Magnetic Islands

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- 2014-2017 Sponsor & Grant No.: NASA NNX15AI65G  
 Total Award Amount: \$438,229  
 Title: Probing the Physics of the Heliopause  
 Sponsor & Grant No.: NASA NNX14AF43G  
 Total Award Amount: \$395,000
- 2013 Title: Investigating the basic physics of high energy ion related space weather radiation hazards  
 Sponsor: Univ. of Alabama in Huntsville  
 Total Award Amount: \$44,312
- 2009-2012 Title: The implication of non-Gaussian magnetic field-line wandering for the anomalous diffusion and shock acceleration of cosmic rays  
 Sponsor & Grant No.: NASA NNX10AC15G  
 Total Award Amount: \$450,461
- 2009-2012 Title: Anomalous Diffusion in the Collisionless Solar wind Plasma  
 Sponsor & Grant No.: NSF-DOE/ARRA ATM-0904007  
 Total Award Amount: \$438,228
- 2009-2012 Title: Modeling the radial dependence of the shock acceleration of solar energetic particles from the corona to Earth with a time-dependent focused transport model  
 Sponsor & Grant No.: NASA NNX09AJ79G  
 Total award amount: \$439,902
- 2007-2008: Title: Time-dependent Cosmic-ray Acceleration and Propagation in the Termination Shock Region and Heliosheath  
 Sponsor & Grant No: NASA NNX07AI64G  
 Total Award Amount: \$125,000
- 2006-2009: Title: Self-consistent Solar Energetic Particle Acceleration by Evolving Shocks Associated with Coronal Mass Ejections  
 Sponsor & Grant No: NASA NNX06AC37G  
 Amount: \$125,000 per year
- 2002-2005: Title: The Role of Large-scale, Merging Solar Wind Fluctuations in the Time-dependent Modulation of Cosmic Rays in the Heliosphere  
 Sponsor & Grant No: NSF ATM-0112772  
 Amount: \$108,000 per year
- 2002-2005: Title: Using Multi-spacecraft Observations to Predict the Structure and Motion of the Heliospheric termination Shock  
 Sponsor & Grant No: NASA NAG5-11604  
 Amount: \$77,000 per year
- 1998-2001 Title: Energetic particle processes in the heliosphere and interstellar space  
 Sponsor & Grant No.: NASA-GSFC NAG5-6969  
 Amount: \$ 94,000 per year
- 1995-1998 Title: Energetic particle processes in the heliosphere and interstellar space  
 Sponsor & Grant No.: NASA NAG5-6426  
 Amount: \$ 145,000 per year
- 1994-1995 Co-principal Investigator for the grant:  
 Title: Energetic particle processes in the heliosphere and interstellar space  
 Sponsor: NASA Headquarters  
 Amount: \$ 80,000 per year
- 1992-1993 South African Foundation for Research Development (FRD) sponsored grant. Evaluated by FRD to be in the Y-category (promising young researchers, usually under the age of



35, with the potential to establish themselves as recognized experts in their field within the 4 year period before re-evaluation ).

Amount: \$3,500 per year.

#### *Recent Co-Investigator*

- 2019-2022 Title: Identification and Characterization of Small-scale Magnetic Flux Ropes  
Sponsor & Grant no.: NASA HGI –80NSSC19K0276  
Total Award Amount: \$149,604
- 2017-2020 Title: Collaborative Research: Turbulence, Structures, and Diffusive Shock Acceleration  
Sponsor & Grant No.: NSF-DOE PHY-1707247  
Total Award Amount: \$300,000
- 2011-2014 Title: Energetic Charged Particles in the Heliosphere: Are Observations Consistent with Acceleration by Shocks?  
Sponsor: NASA Washington, D.C., HQ  
Total Award Amount: \$1,059,173.00
- 2009-2012 Title: Global modeling of the ENA fluxes in the heliosphere: IBEX Guest Investigators program  
Sponsor: NASA Headquarters  
Amount: \$419,799 over 3 years (\$10,538 salary + benefits for Co-I le Roux)
- 2009-2012 Proposal Title: The microphysics of the heliospheric termination shock  
Sponsor: NASA Washington, D.C., HQ  
Total Award Amount: \$433,097 (\$38,354 salary + benefits for Co-I le Roux)
- 2007-2010 Title: The Physics of the Inner Heliosheath: Implications for Cosmic Rays  
Sponsor: NASA Headquarters  
Amount: \$415,622 over 3 years

#### **FELLOWSHIPS**

- 1992 South African Foundation for Research Development (FRD) sponsored stipendium of \$1,740.
- 1991-1993 Recipient of South African VERKA support of \$430 per paper for papers listed under the section "Refereed Papers in Scientific Journals".
- 1990 South African Foundation for Research Development (FRD), Fellowship of \$9,000 for post-doctoral studies abroad at the Institute for Physical Science and Technology, University of Maryland, College Park, MD, USA.
- 1985 South African Council of Scientific and Industrial Research (CSIR), Fellowship for M.Sc. studies

#### **MEMBERSHIP IN PROFESSIONAL SOCIETIES**

- South African Institute for Physics, 1986-1994
- South African Council for Natural Scientists, 1986–1997.
- American Geophysical Union, 1991 – present
- American Physical Society, 2014-present

#### **SERVICE**

**Research**

- Regular reviewer of papers that appear in *Astrophysical Journal*, *Astrophysical Journal Letters*, *Journal for Geophysical Research*, *Geophysical Research Letters*, *Astronomy and Astrophysics*, *ASTRA* and contributions that appear in the *Proceedings of Conferences and Work Shops*.
- Regular reviewer of research proposals on request by NASA and NSF.
- Co-organizer of the Space Science Seminar Series at the University of Maryland, 1995-1998.
- Co-chair of session on Time-dependent Cosmic-ray Modulation at a series of two 3D Cosmic Ray Workshop in Bern, Switzerland, 1996 and 1997.
- Lead convener of special session at the American Geophysical Union Fall Meeting, San Francisco, 1996.
- Organizer of Special Seminar Series on Computational Methods and Modeling in the Physical and Biological Sciences at the University of California (Riverside), 2002
- Co-organizer of 1<sup>st</sup> International Conference: Particle Acceleration and Transport in Cosmic Plasmas, Lake Arrowhead, California, 2002.
- Served on NASA Sun Earth Connection Guest Investigator Program Panel to evaluate proposals, July, 2002.
- Convener of special session at the American Geophysical Union Fall Meeting, San Francisco, December, 2002.
- Co-organizer of 2<sup>nd</sup> International Conference: Turbulence and Waves, Palm Springs, California, February, 2003.
- Co-organizer of 3<sup>rd</sup> International Conference: Physics of the Outer Heliosphere, Riverside, California, February, 2004.
- Organizer of IGPP Astrophysics Seminar Series at the University of California (Riverside), 2002-2005.
- Proposal review, Heliophysics Guest Investigators Program, Space Physics Division, Office of Space Science, NASA, August 2008.
- Proposal review, February 2009: Living With a Star Targeted Research and Technology Program, Space Physics Division, Office of Space Science, NASA.
- Heliophysics Guest Investigators Program proposal review, Space Physics Division, Office of Space Science, NASA, August 2009.
- Reviewed 2 papers for the *Astrophysical Journal* and 2 papers for the *ASTRA Journal*, 2009.
- Co-organizer of the 9<sup>th</sup> Annual International Astrophysics Conference held on Maui, Hawaii from 9-14 March 2010, 2009-2010
- Reviews 2 papers for the *Astrophysical Journal*, 1 paper for the *ASTRA journal*, and 1 paper for *Advances in Space Research* during 2010.
- NSF proposal review, and proposal review for the National Research Foundation of South Africa.
- Lead editor of the conference volume of the 9<sup>th</sup> Annual International Astrophysics Conference, Hawaii, 9-14 March 2010.
- Co-organizer of a special Space Physics Conference Session entitled SH20: "From the Termination Shock to the Interstellar Medium: Dynamics and Physical Processes" at the American Geophysical Union Fall Meeting, San Francisco, 13-17 December, 2010.
- Served on NASA Heliospheric Physics Panel for the Heliophysics Guest Investigator Program in Washington, D. C., February 7-10, 2012.
- Appointed as external examiner and reviewed a thesis from a Ph. D. student, Eugene Engelbrecht of South Africa.
- Reviewed 2 papers for the *Astrophysical Journal*, and the *Annales Geophysicae (ANGEOS)*, 2012.
- Reviewed a proposal for the German Research Foundation, 2012.



- Appointed as external examiner to review a thesis from a Ph. D. student, Du Toit Strauss of South Africa in May 2013.
- Co-organizer of the joint University of Alabama in Huntsville and German Space Physics Summer Camp in July 2013
- Assisted with organization of the yearly Space Weather Summer Camp organized jointly by UAH and the University of Rostock, Germany in 2013
- Reviewed 3 proposals for the NASA Heliospheric Support Research Program, Space Physics Division, Office of Space Science during 2013.
- Reviewed a Proposal for the NSF SHINE program during 2013..
- Reviewed a proposal for the National Research Foundation, South Africa during 2013.
- Reviewed a Reviewed a regular NSF proposal during 2014.
- Reviewer, Journal Article, Astrophysical Journal, August, 2014.
- Reviewer, Journal Article, Journal of Geophysical Research - Space Physics, July, 2014.
- Reviewer, Journal Article, Astrophysical Journal, November, 2014.
- Reviewer, 4 Grant Proposals, NASA HSR Program, November, 2014.
- Reviewer, Grant Proposal, NSF/DOE, January 2015.
- Reviewer, Grant Proposal, NSF, January 2015.
- Reviewer, Journal Article, Astrophysical Journal, April 2015.
- Reviewer, Journal Article, Advances in Space Research, June 2015.
- Reviewer, 2 Conference Papers, Journal Physics: Conference Series, June 2015.
- Letter of Support for Dr. R. D. Strauss' Nomination for the CCP IUPAP C20 Medal, June 2015.
- Reviewer, 6 Grant Proposals, NASA HSR Program, December, 2015.
- Served on NASA HSR Program Panel Meeting, December, 2015.
- Session Chair, AGU Fall Meeting, December 2015.
- Support Letter for Dr. Strauss' Nomination for the IUPAP C20 Award, February 2016.
- Reviewer, Journal Article, The Astrophysical Journal, March 2016.
- Reviewer, 4 Grant Proposals, NSF SHINE Program, March 2016.
- Served on NSF SHINE Program Panel Meeting, March, 2016.
- Conference Deputy Session Organizer, COSPAR 41st Assembly, Istanbul, 2016.
- Reviewer, 6 Grant Proposals, NASA HGI Program, June 2016.
- Served on NASA HGI Program Panel Meeting, June, 2016.
- Reviewer, 3 Grant Proposals, NASA HSR Program, November, 2016.
- Reviewer, Journal Article, The Astrophysical Journal, November, 2016.
- Session Chair, AGU Fall Meeting, December 2016.
- Reviewer, Journal Article, The Astrophysical Journal, January 24, 2017.
- Reviewer, Grant Proposal, German Research Foundation, February 13, 2017.
- Reviewer, Journal Article, Advances in Space Research, March, 2017.
- Letter of Support for Dr. Strauss for the Duggal Award, March 2017.
- Session Chair, AGU Fall Meeting, December 2017.
- 42nd COSPAR Assembly, Pasadena 2018, Session Scientific Organizing Committee, March 2018.
- Reviewed an Astrophysical Journal paper, April 2017.
- Reviewed an Astrophysical Journal paper, August 2017.
- Reviewed a Journal of Plasma Physics paper, July 2017.
- Reviewed an Astrophysical Journal paper, March, 2018.
- Reviewed Dr. Strauss' application for promotion to Associate Professor at the School of Physical and Chemical Sciences, North West University, South Africa, July 2018.
- Reviewed Dr. Engelbrecht's application for promotion to Associate Professor at the School of Physical and Chemical Sciences, North West University, South Africa, July 2018.

- Reviewed a paper for The Astrophysical Journal, July 2018
- Reviewed Dr. Engelbrecht's application for research funding from the National Research Foundation of South Africa, November 2018.
- Reviewed the Masters thesis of Mr. van den Berg, School of Physical and Chemical Sciences, North West University, South Africa, January 2019
- Reviewed a proposal for the German-Israeli Foundation for Scientific Research and Development, February 2019
- Reviewed a paper for the Astrophysical Journal, Summer 2019
- Reviewed proposal Reviewer for the German Research Foundation, Summer 2019
- Reviewed proposal Reviewer for the UK Science & Technology Facilities Council, Fall 2019
- Reviewed paper for The Astrophysical Journal, Fall 2019
- Reference Letters for 2 Space Science Ph. D students in support of their job applications, Fall 2019
- Reviewed 2 papers for The Astrophysical Journal, Spring 2020
- Reference Letters, wrote reference letters for 3 former and current Space Science Ph. D students in support of their job applications and a reference letter for a former REU student applying for another REU program, Spring 2020
- Co-Organizer of Session, EGU Meeting 2020, Vienna, Spring 2020

***Institution (University of Alabama in Huntsville)***

- Faculty phone-a-thon – talked to admitted students to let them know that we hope they will enroll at University of Alabama in Huntsville (UAH), 2010
- Admitted Student Day, my PH100 course was selected for admitted students to attend, interacted with admitted students and parents, 2010.
- Open House - interacted with admitted students and parents, 2010.
- Science Olympiad Committee Member for the Physics Department, looked for volunteers, devised and run an experiment for the Olympiad, 2011.
- Admitted Student Day, my PH100 course was again selected for admitted students to attend, interacted with admitted students and parents, 2011.
- Open House - Lead organizer of the Open House held at the Physics Department, 2011
- Chairman of the Physics Department Science Olympiad Committee. Participated in Science Olympiad Event. The committee also organized a new recruitment initiative from the Department Chair whereby the ten best High School performers in the Physics events of the Olympiad were identified and invited to attend an award ceremony in the Physics Department, and tour the facilities of Physics and CSPAR, 2012.
- Attended 2 Physics Open Houses, 2012.
- Acting as main organizer of the Fall Physics Seminar series, 2012
- Served on a Traffic Appeals Committee , 2012
- Represented the Physics Department in the Faculty Senate. Served on the Senate Personnel Committee where we worked on changes to the Faculty Handbook, 2012.
- Acting as main organizer of the Spring Physics Seminar series, 2013
- Representing the Physics Department in the Faculty Senate. Serving on the Senate Personnel Committee where we worked on policy recommendations for background checks, 2013.
- Acted as observer at the Master defense of a student from the Electrical Engineering Department.
- Serves on the Traffic Appeals Committee, 2013.
- Served on the Committee for the Von Braun Memorial Symposium Student Poster Competition.
- Participated in the Dept. of Space Science Committee for recommending the faculty workload, 2014.
- Acted as observer at the Ph. D. defense of Michelle La Duca of Industrial Systems Engineering, 2014.
- Committee Member, Reviewed 6 proposals and participated in Review Committee Meeting,

- Committee of 2014 Research Infrastructure Fund Program, May, 2014
- Committee Chair, Survey of Employment Market for the Graduates of the SPA program, June 2014.
- Committee Chair, Transition Course Map, September, 2014.
- Member, Promotion Committee for Dr. R. Preece, November 2014.
- Chair, Reappointment Committee of Dr. Qiang Hu. March 2015.
- Chair, Reappointment Committee of Dr. Qiang Hu, April 2016.
- Chair, Research Horizons Day Competition Committee, February 2017.
- Chair of Dept. of Space Science Tenure Committee of Dr. Qiang Hu, 2017-2018.
- Member of College of Science Promotion and Tenure Advisory Committee (PTAC), 2017-2018,
- Member of Promotion Committee for Gang Li's promotion to Full Professor, October 2018
- Member of Department of Space Science Faculty Hire Search Committee, 2019
- Member of Department of Space Science Faculty Hire Search Committee, Spring 2020 -
- Chair of Reappointment Committee of Dr. H. Che, Spring 2020
- Support Letter for researchers Zhao and Adhikari's nomination for University Researcher of the Year 2020 Award, Spring 2020.
- Support letter for Ph. D. Graduate Paris Mostavi's nomination for the AGU Scarf Award, Spring 2020

## PUBLICATIONS

### A. Refereed Papers in Scientific Journals

1. POTGIETER, M. S. & LE ROUX, J. A. 1989. A numerical model for a cosmic ray modulation barrier in the outer heliosphere. *Astronomy and Astrophysics*, 209:406-410.
2. POTGIETER, M. S., LE ROUX, J. A. & BURGER, R. A. 1989. Interplanetary cosmic ray radial gradients with steady state modulation models. *Journal of Geophysical Research*, 94:2323-2332.
3. LE ROUX, J. A. & POTGIETER, M. S. 1990. A time-dependent drift model for the long-term modulation of cosmic rays with special reference to asymmetries with respect to the solar minimum. *Astrophysical Journal*, 361:275-282.
4. LE ROUX, J. A. & POTGIETER, M. S. 1991. The simulation of Forbush decreases with time-dependent cosmic-ray modulation models of varying complexity. *Astronomy and Astrophysics*, 243:531-545.
5. LE ROUX, J. A. & POTGIETER, M. S. 1992. The simulated features of heliospheric cosmic-ray modulation with a time-dependent drift model. II. On the energy dependence of the onset of new modulation in 1987. *Astrophysical Journal*, 390:661-667.
6. LE ROUX, J. A. & POTGIETER, M. S. 1992. The simulated features of heliospheric cosmic-ray modulation with a time-dependent drift model. IV. The role of heliospheric neutral sheet deformation. *Astrophysical Journal*, 397: 686-693.
7. POTGIETER, M. S. & LE ROUX, J. A. 1992. The simulated features of heliospheric cosmic-ray modulation with a time-dependent drift model. I. General effects of the changing neutral sheet over the period 1985-1990. *Astrophysical Journal*, 386:636-646.
8. POTGIETER, M. S. & LE ROUX, J. A. 1992. The simulated features of heliospheric cosmic-ray modulation with a time-dependent drift model. III. General energy dependence. *Astrophysical Journal*, 392:300-309.
9. POTGIETER, M. S., LE ROUX, J. A., BURLAGA, L. F. & McDONALD, F. B. 1993. The role of merged interaction regions and drifts in the heliospheric modulation of cosmic rays beyond 20 AU: a computer simulation. *Astrophysical Journal*, 403:760-768.
10. POTGIETER, M. S. & LE ROUX, J. A. 1994. The long-term heliospheric modulation of

- galactic cosmic rays according to a time-dependent drift model with merged interaction regions. *Astrophysical Journal*, 423:817-827.
11. LE ROUX, J. A. & PTUSKIN, V. S. 1995. Galactic cosmic-ray mediation of a spherical solar wind flow. I. The steady state cold gas hydrodynamical approximation. *Astrophysical Journal*, 438:427-433.
  12. LE ROUX, J. A. & POTGIETER, M. S. 1995. The simulation of complete 11 and 22 year modulation cycles for cosmic rays in the heliosphere using a drift model with global merged interaction regions. *Astrophysical Journal*, 442:847-851.
  13. LE ROUX, J. A. & PTUSKIN, V. S. 1995. Galactic cosmic ray mediation of a spherical solar wind flow. II. The steady state hydromagnetic approximation. *Astrophysical Journal*, 452:423-433.
  14. LE ROUX, J. A., POTGIETER, M. S. & PTUSKIN, V. S. 1996. A transport model for the diffusive shock acceleration and modulation of anomalous cosmic rays in the heliosphere. *Journal of Geophysical Research*, 101:4791-4803.
  15. FICHTNER, H., LE ROUX, J. A., MALL, U. & RUCINSKI, D. 1996. On the transport of pick-up ions in the heliosphere. *Astronomy & Astrophysics*, 314:650-662.
  16. LE ROUX, J. A. & FICHTNER, H. 1997a. The influence of pick-up, anomalous and galactic cosmic ray protons on the structure of the heliospheric shock - a self-consistent approach. *Astrophysical Letters*, 477:L115-L119.
  17. LE ROUX, J. A. & FICHTNER, H. 1997b. A self-consistent determination of the heliospheric termination shock structure in the presence of pickup, anomalous and galactic cosmic-ray protons. *Journal of Geophysical Research*, 102:17365-17380.
  18. LE ROUX, J. A. & PTUSKIN, V. S. 1998. The self-consistent stochastic pre-acceleration of interstellar pickup ions in the solar wind including effects of wave coupling and damping. *Journal of Geophysical Research*, 103:4799-4808.
  19. LE ROUX, J. A. & FICHTNER, H. 1999. Global merged interaction regions, the heliospheric termination shock, and time-dependent cosmic ray modulation. *Journal of Geophysical Research*, 104:4709-4730.
  20. LE ROUX, J. A., ZANK, G. P. & PTUSKIN, V. S. 1999. An evaluation of perpendicular diffusion models regarding cosmic ray modulation on the basis of a hydromagnetic description for solar wind turbulence. *Journal of Geophysical Research*, 104:24845-24862.
  21. LE ROUX, J. A., FICHTNER, H., ZANK, G. P. & PTUSKIN, V. S. 2000. Self-consistent acceleration of multiply reflected pickup ions at the quasi-perpendicular solar wind termination shock: a fluid approach. *Journal of Geophysical Research*, 105:12557-12578.
  22. LE ROUX, J. A., FICHTNER, H., ZANK, G. P. & PTUSKIN, V. S. 2000. Self-consistent injection and acceleration of pickup ions at the solar wind termination shock, *Geophysical Research Letters*, 27:2873-2876.
  23. RICE, W. K. M., ZANK, G. P. & LE ROUX, J. A. 2000. An injection mechanism for shock waves of arbitrary obliquity, *Geophysical Research Letters*, 27:3793-3796.
  24. ZANK, G. P., RICE, W. K. M., LE ROUX, J. A. & MATTHAEUS, W. H. 2001. The injection problem for anomalous cosmic rays. *Astrophysical Journal*, 556:494-500.
  25. ZANK, G. P. RICE, W. K. M., CAIRNS, I. H., LE ROUX, J. A. & WEBB, G. M. 2001. Ion injection and energization at quasi-parallel shocks. *Physics of Plasmas*, 8:4560-4576.
  26. LE ROUX, J. A.; MATTHAEUS, W. H. & ZANK, G. P. 2001. Pickup ion acceleration by turbulent Electric fields in the slow solar wind. *Geophysical Research Letters*, 28:3831-3834.
  27. LE ROUX, J. A., ZANK, G. P., MILANO, L. J. & MATTHAEUS, W. H. 2002. A quasi-linear kinetic theory for charged-particle transport in two-dimensional turbulence. *Astrophysical Journal Letters*, 56:L155-L158.

28. LE ROUX, J. A.; MATTHAEUS, W. H. & ZANK, G. P. 2002. Pickup ion acceleration by turbulent field-aligned electric fields in the slow low-latitude solar wind. *Journal of Geophysical Research*, 107:SSH 9-1-SSH 9-18.
29. LE ROUX, J. A., ZANK, G. P., MILANO, L. J. & MATTHAEUS, W. H. 2004. Energetic particle transport and energization in dynamic two-dimensional turbulence. *Astrophysical Journal*, 602:396-414.
30. VERKHOGLYADOVA, O. P., & LE ROUX, J. A. 2004. Particle diffusion on vortices in nearly incompressible magnetohydrodynamics. *Astrophysical Journal*, 602:1002-1005
31. ZANK, G. P., LI, G., FLORINSKI, V., MATTHAEUS, W. H., WEBB, G. M., & LE ROUX, J. A. 2004. Perpendicular diffusion coefficient for charged particles of arbitrary energy. *J. Geophys. Res.*, 109: A04107(1-9).
32. VERKHOGLYADOVA, O. P. & LE ROUX, J. A. 2005. Particle transport in heliosphere with non-linear 2D structures and random magnetic field, *Journal of Geophysical Research*, 110:A10S03.
33. LE ROUX, J. A., ZANK, G. P., LI, G. & WEBB, G. M. 2005. Non-linear Energetic Charged Particle Transport and Energization in Enhanced Compressive Wave Turbulence Near Shocks. *Astrophysical Journal*, 626:1116-1130.
34. KALLENBACH, R., HILCHENBACH, M., CHALOV, S. V., LE ROUX, J. A., & BAMERT, K. 2005. On the "injection problem" at the solar wind termination shock, *Astronomy & Astrophysics*, 439:1-22
35. WEBB, G. M., ZANK, G. P., KAGHASHVILI, E. KH., & LE ROUX, J. A. 2006. Compound and perpendicular diffusion of cosmic rays and random walk of field lines, I: Parallel particle transport models. *Astrophysical Journal*, 651:211-236.
36. LE ROUX, J. A., WEBB, G. M., FLORINSKI, V., & ZANK, G. P. 2007. A focused transport equation approach to pickup ion shock acceleration: Implications for the termination shock. *Astrophysical Journal*, 662:350-371.
37. LE ROUX, J. A. & WEBB, G. M. 2007. Nonlinear cosmic-ray diffusive transport in combined 2D and slab MHD turbulence: A BGK-Boltzmann approach. *Astrophysical Journal*, 667:930-955.
38. HEERIKHUISEN, J., POGORELOV, N. V., FLORINSKI, V., ZANK, G. P., & LE ROUX, J. A. 2008. The effects of a  $\kappa$ -distribution in the heliosheath on the global heliosphere and ENA flux at 1 AU, *Astrophysical Journal*, 682: 679-689.
39. BAMERT, K., KALLENBACH, R., LE ROUX, J. A., HILCHENBACH, M., SMITH, C. W., & WURTZ, P. 2008. Evidence for Iroshnikov-Kraichnan-Type Turbulence in the Solar Wind Upstream of Interplanetary Traveling Shocks. *Astrophysical Journal Letters*, 675: L45-L48.
40. FLORINSKI, V., DECKER, R., & LE ROUX, J. A. 2008. Pitch-angle distributions of energetic particles near the heliospheric termination shock. *Journal of Geophysical Research*, 113: A07103.
41. LE ROUX, J. A., & WEBB, G. M. 2009. Time-dependent Acceleration of Interstellar Pickup Ions at the Heliospheric Termination Shock Using a Focused Transport Approach. *Astrophysical Journal*, 693: 534-551.
42. SHALCHI, A. WEBB, G. M., LE ROUX, J. A., & ZANK, G. P. 2009, Compound Perpendicular Transport of Charged Particles with Drift, Advection, Wave Propagation Effects, and Arbitrary Turbulence Spectrum, *Astrophysics and Space Science*, DOI: 10.1007/s10509-009-0021-y.
43. WEBB, G. M., KAGHASHVILI, E. Kh., LE ROUX, J. A., ZANK, G. P., & LI, G. 2009. Compound and Perpendicular Diffusion of Cosmic Rays and Random Walk of the Field Lines, II. Non-parallel Particle Transport and Drifts, *Journal Physics A: Mathematical & Theoretical*, 42:235502, 35 pp.
44. SHALCHI, A., LE ROUX, J. A., WEBB, G. M., & ZANK, G. P. 2009. Nonlinear field-line random walk for non-Gaussian statistics. *Journal Physics A: Mathematical & Theoretical*, 42:345501. 17 pp.
45. FLORINSKI, V., DECKER, R. B., LE ROUX, J. A., & ZANK, G. P. 2009. An energetic-particle



- mediated termination shock observed by Voyager 2. *Geophysical Research Letters*, 36:L12101, 4 pp.
46. SHALCHI, A., LE ROUX, J. A., WEBB, G. M., & ZANK, G. P. 2009, Analytical description for field-line wandering in strong magnetic turbulence, *Physical Review E*, 80:066408, 7 pp.
  47. LE ROUX, J. A., WEBB, G. M., SHALCHI, A., & ZANK, G. P. 2010, A Generalized Nonlinear Guiding Center Theory for the Collisionless Anomalous Perpendicular Diffusion of Cosmic Rays. *Astrophysical Journal*, 716:671-692.
  48. LE ROUX, J. A. 2011, The Effect of Intermittent Gyro-scale Slab Turbulence on Parallel and Perpendicular Cosmic-ray Transport, *Astrophysical Journal*, 743:72, 11 pp.
  49. LE ROUX, J. A. & WEBB, G. M. 2012, A Focused Transport Approach to Time-dependent Shock Acceleration of Solar Energetic Particles at a Fast Traveling Shock. *Astrophysical Journal*, 746:104, 21 pp.
  50. WEBB, G. M., HU, Q., LE ROUX, J. A., DASGUPTA, B., & ZANK, G. P. 2012, Hamiltonians and variational principles for Alfvén simple waves. *Journal Physics A: Mathematical & Theoretical*, 45:025203, 33 pp.
  51. SHALCHI, A., DOSCH, A., LE ROUX, J. A., WEBB, G. M., & ZANK, G. P. 2012, Magnetic-field-line random walk in turbulence: A two-point correlation function description. *Physical Review E*, 85:026411, 14 pp.
  52. SHALCHI, A., WEBB, G. M., & LE ROUX, J. A. 2012. Parallel transport of cosmic rays for non-diffusive pitch-angle scattering I. Using the standard Fokker-Planck equation. *Astrophysical Journal*, 85:065901, 10 pp.
  53. ARTHUR, A. D., & LE ROUX, J. A. 2013. Particle Acceleration at the Heliospheric Termination Shock with a Stochastic Shock Obliquity Approach. *Astrophysical Letters*, 772:L26 5pp.
  54. FLORINSKI, V., JOKPII, J. R., ALOUANI-BIBI, F., & LE ROUX, J. A. 2013, Energetic Particle Anisotropies at the Heliospheric Boundary. *Astrophysical Journal Letters*, 776: L37, 5 pp.
  55. ALOUANI-BIBI, F., & LE ROUX, J. A. 2014. Transport of Cosmic-ray Protons in Intermittent Heliospheric Turbulence: Model and simulations. *Astrophysical Journal*, 781:93, 12 pp.
  56. ZANK, G. P., LE ROUX, J. A., WEBB, G. M., DOSCH, A., & KHABAROVA, O. V. 2014. Particle Acceleration via Reconnection Processes in the Supersonic Solar Wind. *Astrophysical Journal*, 797:28, 18 pp.
  57. XU, F., LI, G., ZHAO, L., ZHANG, Y., KHABAROVA, O. V., MIAO, B. & LE ROUX, J. A. 2014. Angular Distribution of Solar Wind Magnetic Field Vector at 1 AU. *Astrophysical Journal*. 801:58, 7 pp.
  58. LE ROUX, J. A., ZANK, G. P., WEBB, G. M., & KHABAROVA, O. V. 2015. A Kinetic Transport Theory for Particle Acceleration and Transport in Regions of Multiple Contracting and Reconnecting Inertial-scale Flux Ropes. *Astrophysical Journal*, 801:112, 24 pp.
  59. FLORINSKI, V., STONE, E. C., CUMMINGS, A. C., & LE ROUX, J. A. 2015. Energetic Particle Anisotropies at the Heliospheric Boundary. II. Transient Features and Rigidity Dependence. *Astrophysical Journal*, 803:47, 8 pp.
  60. KHABAROVA, O. V., ZANK, G. P., LI, G., LE ROUX, J. A., WEBB, G. M., DOSCH, A., & MALANDRAKI, O. E. 2015. Small-scale Magnetic Islands in the Solar Wind and Their Role in Particle Acceleration. I. Dynamics of Magnetic Islands Near the Heliospheric Current Sheet. *Astrophysical Journal*, 808:181, 13 pp.
  61. ZANK, G. P., HUNANA, P., MOSTAFAVI, P., LE ROUX, J. A., LI, G., WEBB, G. M.; KHABAROVA, O. V., CUMMINGS, A. C., STONE, E. C., & DECKER, R. B. 2015. Diffusive Shock Acceleration and Reconnection Acceleration Processes. *Astrophysical Journal*, 814:137, 23 pp.
  62. STRAUSS, R. D., LE ROUX, J. A., ENGELBRECHT, N. E., RUFFOLO, D., & DUNZLAFF, P. 2016. Non-Axisymmetric Perpendicular Diffusion of Charged Particles and their Transport Across



- Tangential Magnetic Discontinuities. *Astrophysical Journal*, 825: 43, 14 pp.
63. YE, J., LE ROUX, J. A., & ARTHUR, A. D. 2016. Interstellar Pickup Ion Acceleration in the Turbulent Magnetic Field at the Solar Wind Termination Shock Using a Focused Transport Approach. *Astrophysical Journal*, 826:117, 17 pp.
  64. LE ROUX, J. A., ZANK, G. P., WEBB, G. M., & KHABAROVA, O. V. 2016. Combining Diffusive Shock Acceleration with Acceleration by Contracting and Reconnecting Small-scale Flux Ropes at Heliospheric Shock. *Astrophysical Journal*, 827:47, 28 pp.
  65. KHABAROVA, O. V., ZANK, G. P., LI, G., MALANDRAKI, O. E., LE ROUX, J. A., & WEBB, G. M. 2016. Small-scale Magnetic Islands in the Solar Wind and Their Role in Particle Acceleration. II. Particle Energization inside Magnetically Confined Cavities. *Astrophysical Journal*, 827:122, 21 pp.
  66. KHABAROVA, O. V., ZANK, G. P., MALANDRAKI, O. E., LI, G., LE ROUX, J. A., & WEBB, G. M. 2017. Observational evidence for local particle acceleration associated with magnetically confined magnetic islands in the heliosphere - a review. *Sun and Geosphere*, 12:23-30.
  67. ENGELBRECHT, N. E., STRAUSS, R. D., LE ROUX, J. A., & BURGER, R. A. 2017. Toward a Greater Understanding of the Reduction of Drift Coefficients in the Presence of Turbulence. *Astrophysical Journal*, 841:107, 8 pp.
  68. POGORELOV, N. V., FICHTNER, H., CZECHOWSKI, A., LAZARIAN, A., LEMBEGE, B., LE ROUX, J. A., POTGIETER, M. S., SCHERER, K., STONE, E. C., STRAUSS, R. D., & 4 CO-AUTHORS 2017. Heliosheath Processes and the Structure of the Heliopause: Modeling Energetic Particles, Cosmic Rays, and Magnetic Fields. *Space Science Reviews*, 212:193-248.
  69. WEBB, G. M., BARGHOUTY, A. F., HU, Q. & LE ROUX, J. A. 2018. Particle Acceleration Due to Cosmic-ray Viscosity and Fluid Shear in Astrophysical Jets. *Astrophysical Journal*, 855:31. 23 pp.
  70. HU, Q., ZHENG, J., CHEN, Y., LE ROUX, J. A. & ZHAO, L. 2018. Automated Detection of Small-scale Magnetic Flux Ropes in the Solar Wind: First Results from the Wind Spacecraft Measurements. *Astrophysical Journal Supplemental Series*, 239:12. 26 pp.
  71. LE ROUX, J. A., ZANK, G. P. & KHABAROVA, O. V. 2018. Self-consistent Energetic Particle Acceleration by Contracting and Reconnecting Small-scale Flux Ropes: The Governing Equations. *Astrophysical Journal*, 864:158. 51 pp.
  72. ZHAO, L. L., ZANK, G. P., CHEN, Y., HU, Q., LE ROUX, J. A., DU, S. & ADHIKARI, L. 2019. Particle Acceleration at 5 au Associated with Turbulence and Small-scale Magnetic Flux Ropes. *Astrophysical Journal*, 872:4. 16 pp.
  73. STRAUSS, R. D. & LE ROUX, J. A. 2019. Solar Energetic Particle Propagation in Wave Turbulence and the Possibility of Wave Generation. *Astrophysical Journal*, 872:125. 15 pp.
  74. PRINSLOO, P. L., STRAUSS, R. D., & LE ROUX, J. A. 2019. Acceleration of Solar Wind Particles by Traveling Interplanetary Shocks. *The Astrophysical Journal*, 878:144. 22 pp.
  75. ZHAO, L.-L., ZANK, G. P., HU, Q., CHEN, Y., ADHIKARI, L., LE ROUX, J. A., ... BURLAGA, L. F. 2019. ACR Proton Acceleration Associated with Reconnection Processes beyond the Heliospheric Termination Shock. *The Astrophysical Journal*, 886:144. 11 pp.
  76. WEBB, G. M., AL-NUSSIRAT, S., MOSTAFAVI, P., BARGHOUTY, A. F., LI, G., LE ROUX, J. A., & ZANK, G. P. 2019. Particle Acceleration by Cosmic Ray Viscosity in Radio-jet Shear Flows. *The Astrophysical Journal*, 881:123. 25 pp.
  77. LE ROUX, J. A., WEBB, G. M., KHABAROVA, O. V., ZHAO, L. L., & ADHIKARI, L. 2019. Modeling Energetic Particle Acceleration and Transport in a Solar Wind Region with Contracting and Reconnecting Small-scale Flux Ropes at Earth Orbit. *The Astrophysical Journal*, 887:77. 25 pp.
  78. CHEN, Y., HU, Q., & LE ROUX, J. A. 2019. Analysis of Small-scale Magnetic Flux Ropes Covering the Whole Ulysses Mission. *The Astrophysical Journal*, 881:58. 16 pp.
  79. MALANDRAKI, O., KHABAROVA, O. V., BRUNO, R., ZANK, G. P., LI, G., JACKSON, B., ...

- LE ROUX, J. A., CHEN, Y., HU, Q., & ENGELBRECHT, N. E. 2019. Current Sheets, Magnetic Islands, and Associated Particle Acceleration in the Solar Wind as Observed by Ulysses near the Ecliptic Plane. *The Astrophysical Journal*, 881:116. 20 pp.
80. WEBB, G. M., MOSTAFAVI, P., AL-NUSSIRAT, S., BARGHOUTY, A. F., LI, G.; LE ROUX, J. A., ZANK, G. P. 2020. Cosmic-Ray Acceleration in Radio-jet Shear Flows: Scattering Inside and Outside the Jet. *The Astrophysical Journal*, 894:95. 25 pp.
81. PEZZI, O., PECORA, F., LE ROUX, J., ENGELBRECHT, N. E., GRECO, A., SERVIDIO, S., MALOVA, H. V., KHABAROVA, O. V., MALANDRAKI, O., BRUNO, R., MATTHAEUS, W. H., LI, G., ZELENYI, L. M., KISLOV, R. A., OBRIDKO, V. N., & KUZNETSOV, V. D. 2021. Current sheets, plasmoids and flux ropes in the heliosphere. Part II: Theoretical aspects. *Space Science Reviews*, in press.

### **B. Refereed Papers in Conference and Workshop Proceedings**

1. LE ROUX, J. A. & POTGIETER, M. S. 1989. Episodic cosmic-ray modulation in the heliosphere. *Advances in Space Research*, 9(4):225-228.
2. POTGIETER, M. S. & LE ROUX, J. A. 1989. More on a possible modulation barrier in the outer heliosphere. *Advances in Space Research*, 9(12):121-124.
3. LE ROUX, J. A. & POTGIETER, M. S. 1993. The simulation of merged interaction regions in the outer heliosphere. *Advances in Space Research*, 13(6): 251-256.
4. HAASBROEK, L. J., POTGIETER, M. S. & LE ROUX, J. A. 1995. A computer simulation of large cosmic ray decreases and their effects on the declining modulation cycle. *Advances in Space Research*, 16(9):209-212.
5. HAASBROEK, L. J., POTGIETER, M. S. & LE ROUX, J. A. 1997. Acceleration of galactic and Jovian electrons at the heliospheric solar wind termination shock. *Advances in Space Research*, 19:953-956.
6. PTUSKIN, V. S., ROGOVAYA, S. I., ZIRAKASHVILI, V. N. & LE ROUX, J. A. 1997. Dissipation of interplanetary turbulence by pick-up ions. *Advances in Space Research*, 19:945-948.
7. LE ROUX, J. A. & POTGIETER, M. S. 1998. The modeling of merged interaction region associated decreases and recoveries in the long-term cosmic-ray intensity with time-dependent drift models. *Space Science Reviews*, 83:329-336.
8. LE ROUX, J. A. & PTUSKIN, V. S. 1998. The self-consistent stochastic pre-acceleration of pickup ions in the heliosphere. *Space Science Reviews*, 83:286-291.
9. LE ROUX, J. A. 1999. Time-dependent cosmic-ray modulation and global merged interaction regions. *Advances in Space Research*, 23:491-599, **invited talk**.
10. LE ROUX, J. A. & FICHTNER, H. 1999. The simulation of step decreases in the cosmic ray intensity with a cosmic-ray-hydrodynamic model. *Advances in Space Research*, 23:501-504.
11. ZANK, G. P., RICE, W. K. M., LE ROUX, J. A., LU, J. Y. & MULLER, H. R. 2001. The injection problem for anomalous cosmic rays, *ACE-2000 Symposium, AIP Conference Proceedings*, 528:317-324.
12. LE ROUX, J. A., FICHTNER, H., ZANK, G. P. & PTUSKIN, V. S. 2001. A self-consistent, unified model of pickup ion and anomalous cosmic ray transport, *ACE-2000 Symposium, AIP Conference Proceedings*, 528:341-344.
13. RICE, W. K. M., ZANK, G. P., LE ROUX, J. A. & MATTHAEUS, W. H. 2001. The preacceleration of anomalous cosmic rays, *Advance in Space Research*, 27:835-840.
14. LE ROUX, J. A. FICHTNER, H., ZANK, G. P. & PTUSKIN, V. S. 2001. Self-consistent acceleration of pickup ions at the termination shock. *The Outer Heliosphere: The Next Frontiers*, Edited by K. Scherer, Horst Fichtner, Hans Jörg Fahr, and Eckart Marsch *COSPAR Colloquia Series, 11*. Amsterdam: Pergamon Press,

- 2001, p.215-218.
15. LE ROUX, J. A. 2001. Anomalous cosmic rays: Current and future developments theoretical Developments. *The Outer Heliosphere: The Next Frontiers*, Edited by K. Scherer, Horst Fichtner, Hans Jörg Fahr, and Eckart Marsch *COSPAR Colloquium Series, 11*. Amsterdam: Pergamon Press, 2001, p.163-172.
  16. ZANK, G. P., RICE, W. K. M., LE ROUX, J. A. & MATTHAEUS, W. H. 2001. The injection problem for anomalous cosmic rays. *The Outer Heliosphere: The Next Frontiers*, Edited by K. Scherer, Horst Fichtner, Hans Jörg Fahr, and Eckart Marsch *COSPAR Colloquium Series, 11*. Amsterdam: Pergamon Press, 2001, p.211-214.
  17. LE ROUX, J. A. 2004. Energetic particle transport in regions of enhanced compressive turbulence. *The Physics of the Outer Heliosphere*, Edited by V. Florinski *IGPP-UCR 3<sup>rd</sup> International Astrophysics Conference, AIP Conf. Proceedings*, 719: 341-346, **invited talk**.
  18. VERKHOGLYADOVA, O. P. & LE ROUX, J. A. 2004. Cosmic Ray transport in a Vortex Flow *The Physics of the Outer Heliosphere*, Edited by V. Florinski, N. V. Pogorelov & G. P. Zank *IGPP-UCR 3<sup>rd</sup> International Astrophysics Conference, AIP Conference Proceedings*, 719:243-248.
  19. LI, G., ZANK, G. P., LE ROUX, J. A., WEBB, G. M. & AXFORD, W. I., Particle acceleration at a turbulent shock, *The Physics of the Outer Heliosphere*, Edited by V. Florinski, N. V. Pogorelov & G. P. Zank *IGPP-UCR 3<sup>rd</sup> International Astrophysics Conference, AIP Conference Proceedings*, 719:347-352.
  20. ZANK, G. P., AXFORD, W. I., FLORINSKI, V., LI, G., LE ROUX, J. A., & WEBB, G. M. 2004. Structure and properties of the heliospheric termination shock. *The Physics of the Outer Heliosphere*, Edited by V. Florinski, N. V. Pogorelov and G. P. Zank *IGPP-UCR 3<sup>rd</sup> International Astrophysics Conference, AIP Conference Proceedings*, 719:329-340.
  21. VERKHOGLYADOVA & LE ROUX, J. A. 2004. Particle transport in a vortex medium. *Advances in Space Research*, 35:660-664.
  22. VERKHOGLYADOVA, O. P., & LE ROUX, J. A. 2005. Anomalous diffusion of energetic particles: Implications for diffusive particle acceleration at a quasi-perpendicular shock, *The Physics of Collisionless Shocks*, Edited by G. Li, G. P. Zank, and C. T. Russel, *IGPP-UCR 4<sup>th</sup> International Astrophysics Conference (Palm Springs), AIP Conference Proceedings*, 781:196-200.
  23. LE ROUX, J. A., ZANK, G. P., LI, G., & WEBB, G. M. 2005. Energetic particle transport in strong compressive wave turbulence near shocks, *The Physics of Collisionless Shocks*, Edited by G. Li, G. P. Zank, and C. T. Russel, *IGPP-UCR 4<sup>th</sup> International Astrophysics Conference (Palm Springs), AIP Conference Proceedings*, 781:191-195.
  24. ZANK, G. P., LI, G., WEBB, G. M., LE ROUX, J. A., FLORINSKI, V., AO, X., & RICE, W. K. M. 2005. Particle acceleration at collisionless shocks: An overview, *The Physics of Collisionless Shocks*, Edited by G. Li, G. P. Zank, and C. T. Russel, *IGPP-UCR 4<sup>th</sup> International Astrophysics Conference (Palm Springs), AIP Conference Proceedings*, 781:191-195.
  25. WEBB, G. M., ZANK, G. P., KAGHASHVILI, E. Kh., & LE ROUX, J. A. 2006. Compound and perpendicular diffusive transport of cosmic rays. *The Physics of the Inner Heliosheath*, Edited by J. Heerikhuisen, V. Florinski, G. P. Zank, *IGPP-UCR 5<sup>th</sup> International Astrophysics Conference (Wakiki, Hawaii), AIP Conference Proceedings*, 858:213-218
  26. LE ROUX, J. A., & WEBB, G. M. 2006. Acceleration of pickup ions at the termination shock. *The Physics of the Inner Heliosheath*, Edited by J. Heerikhuisen, V. Florinski, G. P. Zank, *IGPP-UCR 5<sup>th</sup> International Astrophysics Conference (Wakiki, Hawaii), AIP Conference Proceedings*, 858:190-195.
  27. FLORINSKI, V., ZANK, G. P., & LE ROUX, J. A. 2007. Acceleration at the termination shock: Anisotropies and spectra. *Advances in Space Research*, 41:361-367.
  28. LE ROUX, J. A. & WEBB, G. M. 2007. A BGK-Boltzmann approach to nonlinear cosmic-ray

- transport in 2D and slab turbulence. *Turbulence and Nonlinear Processes in Astrophysical Plasmas*, Edited by D. Shaikh, *IGPP-UCR 6<sup>th</sup> International Astrophysics Conference (Waikiki, Hawaii)*, *AIP Conference Proceedings*, 932:258-263.
29. LE ROUX, J. A. 2008a. Time-dependent Acceleration of Pickup Ions at the Heliospheric Termination Shock. *Particle Acceleration and Transport in the Heliosphere and Beyond*, Edited by G. Li, Q. Hu, O. P. Verkhoglyadova, G. P. Zank, R. P. Lin, *IGPP-UCR 7<sup>th</sup> International Astrophysics Conference (Kauai, Hawaii)*, *AIP Conference Proceedings*, 1039:404-409.
  30. LE ROUX, J. A. 2008b. Time-dependent Acceleration of Solar Wind Particles at Interplanetary Shocks, *Particle Acceleration and Transport in the Heliosphere and Beyond*, Edited by G. Li, Q. Hu, O. P. Verkhoglyadova, G. P. Zank, R. P. Lin, *IGPP-UCR 7<sup>th</sup> International Astrophysics Conference (Kauai, Hawaii)*, *AIP Conference Proceedings*, 1039:258- 263.
  31. FLORINSKI, V., DECKER, R. B., & LE ROUX, J. A. 2008. Low energy partricle acceleration at and compression at the termination shock an in the heliosheath, *Particle Acceleration and Transport in the Heliosphere and Beyond*, Edited by G. Li, Q. Hu, O. P. Verkhoglyadova, G. P. Zank, R. P. Lin, *IGPP-UCR 7<sup>th</sup> International Astrophysics Conference (Kauai, Hawaii)*, *AIP Conference Proceedings*, 1039:361-366.
  32. WEBB, G. M., LE ROUX, J. A., & ZANK, G. P. 2009. Drift Kinetic Theory and Cosmic Rays. *Shock Waves in Space and Astrophysical Environments in Shock Waves in Space and Astrophysical Environments*, Edited by X. Ao, R. Burrows, G. P. Zank, *8<sup>th</sup> Annual International Astrophysics Conference (Hawaii, Hawaii)*, *AIP Conference Proceedings*, 1183:85-92.
  33. LE ROUX, J. A. 2011, The effect of intermittent turbulence on cosmic-ray transport. *Partially Ionized Plasmas throughout the Cosmos*, Edited by V. Florinski, *UAHWORKSHOP 2010 (Nashville)*, *AIP Conference Proceedings*, 1366:30-38, 20.
  34. LE ROUX, J. A., & WEBB, G. M. 2012. The Pre-heating and Injection of Bulk Solar Wind and Suprathermal Protons into First Order Fermi Acceleration at a Fast Traveling Shock in *Physics of the Heliosphere: A 10-year Retrospective*, Edited by G. P. Zank, J. Heerikhuisen, G. Li, N. Pogorelov, *10th Annual International Astrophysics Conference (Maui, Hawaii)*, *AIP Conference Proceedings*, 1436:171-177, 2012.
  35. WEBB, G. M., HU, Q., LE ROUX, J. A., DASGUPTA, B., & ZANK, G. P. 2012. Double Alfvén waves in *Physics of the Heliosphere: A 10-year Retrospective*, Edited by G. P. Zank, J. Heerikhuisen, G. Li, N. Pogorelov, *10th Annual International Astrophysics Conference (Maui, Hawaii)*, *AIP Conference Proceedings*, 1436:74-79.
  36. WEBB, G. M., MCKENZIE, J. F., HU, Q., LE ROUX, J. A., AND ZANK, G. P. 2012, Alfvén wave Interactions in the solar wind in *Space Weather: The Space Radiation Environment, 11th Annual International Astrophysics Conference (Palm Springs, California)*, *AIP Conference Proceedings*, 1500:86-92.
  37. ALOUANI-BIBI, F., AND LE ROUX, J. A. 2012. Diffusion of energetic particles in heliospheric intermittent slab turbulence in *Space Weather: The Space Radiation Environment, 11th Annual International Astrophysics Conference (Palm Springs, California)*, *AIP Conference Proceedings*, 1500:86-92.
  38. LE ROUX, J. A., WEBB, G. M., AND YE, J. 2014. A Generalized Focused Transport Equation in *Outstanding Problems in Heliophysics: From Coronal Heating to the Edge of the Heliosphere*, Edited by Q. Hu, G. P. Zank, *Annual International Astrophysics Conference (Myrtle Beach, South Carolina)*, *AIP Conference Proceedings*, 484:110.
  39. KHABAROVA, O. V., ZANK, G. P., LI, G., LE ROUX, J. A., WEBB, G. M., MALANDRAKI, O. E., & ZHARKOVA, V. V. 2015. Dynamical small-scale magnetic islands as a source of local acceleration of particles in the solar wind. *Journal of Physics: Conference Series*, 642:012033, 15 pp.



40. STRAUSS, R. D., FICHTNER, H., POTGIETER, M. S., LE ROUX, J. A., & LUO, X. 2015. Cosmic ray transport near the heliopause. *Journal of Physics: Conference Series*, 642:012026, 9 pp.
41. ZANK, G. P., HUNANA, P., MOSTAFAVI, P., LE ROUX, J. A., LI, G., & WEBB, G. M. 2015. Particle acceleration by combined diffusive shock acceleration and downstream multiple magnetic island acceleration. *Journal of Physics: Conference Series*, 642: 012031, 11 pp.
42. LE ROUX, J. A., WEBB, G. M., ZANK, G. P., & KHABAROVA, O. V. 2015. Energetic Ion Acceleration by Small-scale Solar Wind Flux Ropes. *Journal of Physics: Conference Series*, 642:012015, 10 pp.
42. ZANK, G. P., HUNANA, P., MOSTAFAVI, P., LE ROUX, J. A., WEBB, G. M., KHABAROVA, O. V., CUMMINGS, A. C., STONE, E. C., & DECKER, R. B. 2016. Particle acceleration and reconnection in the solar wind. *AIP Conference Proceedings*, 1720:070011
43. LE ROUX, J. A., & ARTHUR, A. D. 2017. Acceleration of Solar Energetic Particles at a Fast Traveling Shock in Non-uniform Coronal Conditions. *Journal of Physics: Conference Series*, 900:012013, 10 pp.
44. ZHENG, J., HU, Q., CHEN, Y., & LE ROUX, J. A. 2017. Automated Detection of Small-scale Magnetic Flux Ropes and Their Association with Shocks. *Journal of Physics: Conference Series*, 900:012024, 15 pp.
45. LE ROUX, J. A., ZANK, G. P. & KHABAROVA, O. 2018. Investigation of different small-scale flux-rope acceleration scenarios for energetic particles in the solar wind near Earth. *Journal of Physics: Conference Series*, 1100:012015. 15 pp.
46. CHEN, Y., HU, Q., CHEN, Y., LE ROUX, J. A., & ZHENG, J. 2018. Observational Analysis of Small-scale Magnetic Flux Ropes from Ulysses In-situ Measurements, *Journal of Physics: Conference Series*, 1100:012006. 19 pp.
47. HU, Q., CHEN, Y., & LE ROUX, J. A. 2019. Radial evolution of the properties of small-scale magnetic flux ropes in the solar wind. *Journal of Physics Conference Series*, 1332:012005. 12 pp.
48. ZHAO, L. L.; ZANK, G. P.; ADHIKARI, L.; HU, Q.; LE ROUX, J. 2020. Evidence of magnetic flux ropes downstream of the heliospheric termination shock. *Journal of Physics: Conference Series*, 1620: 012027.
49. STRAUSS, R. D., VAN DEN BERG, J. P., STEYN, P. J., EFFENBERGER, F. J., WIJSEN, N., LAITINEN, T., & LE ROUX, J. A. 2020. Perpendicular diffusion of solar energetic particles: When is the diffusion approximation valid? *Journal of Physics: Conference Series*, 1620:012021.
50. LE ROUX, J. A., WEBB, G. M., KHABAROVA, O. V., VAN ECK, K. T., ZHAO, L. -L., & ADHIKARI, L. 2020. *Journal of Physics: Conference Series*, 1620:012008.

### **C. Papers in the Proceedings of the International Cosmic ray Conferences (ICRC)**

1. POTGIETER, M. S., BURGER, R. A. & LE ROUX, J. A. 1987. The modulation of cosmic-ray electrons in drift models. *Proceedings of the 20th International Cosmic Ray Conference (Moscow)*, 3:295-298.
2. POTGIETER, M. S. & LE ROUX, J. A. 1987. On a possible modulation barrier in the outer heliosphere. *Proceedings of the 20th International Cosmic Ray Conference (Moscow)*, 3:291-294.
3. POTGIETER, M. S., LE ROUX, J. A. & BURGER, R. A. 1987. Radial gradients and cosmic-ray modulation models. *Proceedings of the 20th International Cosmic Ray Conference (Moscow)*, 3:287-290.
4. LE ROUX, J. A. & POTGIETER, M. S. 1990. The simulation of long-term modulation of cosmic rays with a time-dependent wavy neutral sheet drift model. *Proceedings of the 21st International Cosmic Ray Conference (Adelaide)*, 6:87-90.
5. LE ROUX, J. A. & POTGIETER, M. S. 1990. The simulation of Forbush decreases in a time

- dependent drift model with a wavy neutral sheet. *Proceedings of the 21st International Cosmic Ray Conference (Adelaide)*, 6:230-233.
6. POTGIETER, M. S. & LE ROUX, J. A. 1990. The predictions of a time-dependent drift model compared with cosmic-ray intensity observations from 1976 to 1989. *Proceedings of the 21st International Cosmic Ray Conference (Adelaide)*, 6:91-94.
  7. LE ROUX, J. A. & POTGIETER, M. S. 1991. The simulated features of the heliospheric modulation of galactic cosmic rays using a time-dependent drift model: II. Effects of the changing solar magnetic field. *Proceedings of the 22nd International Cosmic Ray Conference (Dublin)*, 6:553-556.
  8. PERKO, J. S., BURLAGA, L. F., POTGIETER, M. S. & LE ROUX, J. A. 1991. Simulations of the relative galactic cosmic-ray intensity between Voyager 1 and Voyager 2. *Proceedings of the 22nd International Cosmic Ray Conference (Dublin)*, 6:537-540.
  9. POTGIETER, M. S. & LE ROUX, J. A. 1991. The simulated features of the heliospheric modulation of galactic cosmic rays using a time-dependent drift model: I. Effects of the changing neutral sheet. *Proceedings of the 22nd International Cosmic Ray Conference (Dublin)*, 6:549-552.
  10. LE ROUX, J. A. & POTGIETER, M. S. 1993. The simulation of the 1977-1987 cosmic-ray modulation cycle using a drift model with global merged interaction regions. *Proceedings of 23rd International Cosmic Ray Conference (Calgary)*, 3:509-512.
  11. LE ROUX, J. A. & POTGIETER, M. S. 1993. An explanation for the large step decreases in long-term cosmic-ray modulation: a computed simulation. *Proceedings of 23rd International Cosmic Ray Conference (Calgary)*, 3:505-508.
  12. POTGIETER, M. S., LE ROUX, J. A., McDONALD, F. B. & BURLAGA, L. F. 1993. The causes of the 11-year and 22-year cycles in cosmic-ray modulation. *Proceedings of 23rd International Cosmic Ray Conference (Calgary)*, 3:525-528.
  13. HAASBROEK, L. J., POTGIETER, M. S., & LE ROUX, J. A. 1995. The time-dependent recovery after the large cosmic-ray decrease in 1991. *Proceedings of the 24th International Cosmic Ray Conference (Rome)*, 3:710-713.
  14. LE ROUX, J. A., POTGIETER, M. S. 1995. & PTUSKIN, V. S. A transport model for the diffusive shock acceleration and modulation of the anomalous component in the heliosphere. *Proceedings of the 24th International Cosmic Ray Conference (Rome)*, 3:722-725.
  15. LE ROUX, J. A. & PTUSKIN, V. S. 1995. The dynamic relevance of the heliospheric magnetic field according to a spherically-symmetric energetic particle hydromagnetic model. *Proceedings of the 24th International Cosmic Ray Conference (Rome)*, 3:726-729.
  16. HAASBROEK, L. J., POTGIETER, M. S., & LE ROUX, J. A. 1997. Some modulation effects of termination shock accelerated galactic and Jovian electrons. *Proceedings of the 25th International Cosmic Ray Conference (Durban)*, 2:29-32
  17. LE ROUX, J. A. & PTUSKIN, V. S. 1997. The self-consistent stochastic acceleration of pickup ions in the outer heliosphere in the presence of MHD wave-wave interaction and wave damping. *Proceedings of the 25th International Cosmic Ray Conference (Durban)*, 2:245-248.
  18. LE ROUX, J. A. & FICHTNER, H. 1997. The influence of pickup ions, anomalous and galactic cosmic rays on the structure of the heliospheric termination shock – a self-consistent approach. *Proceedings of the 25th International Cosmic Ray Conference (Durban)*, 2:221-224.
  19. LE ROUX, J. A. , ZANK, G. P., PTUSKIN, V. S. & MORAAL H. 1999. Cosmic ray diffusion coefficients determined for different models of perpendicular diffusion on the basis of a MHD transport model for solar wind turbulence. *Proceedings of the 26th International Cosmic Ray Conference (Salt Lake City)*, 3:65-68.
  20. LE ROUX, J. A. , ZANK, G. P., PTUSKIN, V. S. & MORAAL H. 1999. The role of different



- perpendicular diffusion models in anomalous and galactic cosmic ray modulation. *Proceedings of the 26th International Cosmic Ray Conference (Salt Lake City)*, 3:45-48.
21. LE ROUX, J. A., FICHTNER, H., & ZANK, G. P. 1999. Implications of pickup ion reflection at quasi-the quasi-perpendicular termination shock for the shock structure and anomalous cosmic ray modulation. *Proceedings of the 26th International Cosmic Ray Conference (Salt Lake City)*, 3:585-588.
  22. ZANK, G. P., LE ROUX, J. A., MATTHAEUS, W. H. & MORAAL, H. 1999. Solar wind turbulence, diffusion coefficients, and cosmic ray modulation. *Proceedings of the 26th International Cosmic Ray Conference (Salt Lake City)*, 3:41-44.
  23. ZANK, G. P., RICE W. K. M., CAIRNS, I. H., LE ROUX, J. A. & WEBB, G. M. 1999. Pickup ion injection at quasi-parallel shocks, *Proceedings of the 26<sup>th</sup> International Cosmic Ray Conference (Salt Lake City)*, 3:472-475.
  24. FLORINSKI, V, STONE, E. C., CUMMINGS, A. C., & LE ROUX, J. A. 2015. Cosmic rays beyond the boundary of the heliosphere. *Proceedings of the 34th International Cosmic Ray Conference, Proceedings of Science, (The Hague, The Netherlands)*, 7 pp.
  25. STRAUSS, R. D., FICHTNER, H., LE ROUX, J. A., Cosmic ray anisotropies near the heliopause. *Proceedings of the 34th International Cosmic Ray Conference, Proceedings of Science, (The Hague, The Netherlands)*, 4 pp.

#### **D. Papers in the Proceedings of Other International Conferences**

1. LE ROUX, J. A. & POTGIETER, M. S. 1989. A time-dependent drift model with a simulated wavy neutral sheet for the solar modulation of cosmic rays. *Proceedings of the 1st COSPAR Colloquium on the Physics of the Outer Heliosphere (Serock, Poland)*, 143-146.
2. POTGIETER, M. S. & LE ROUX, J. A. 1989. The predictions of a time-dependent drift model compared with the cosmic-ray intensity observations from 1976 to 1989. *Proceedings of the 1st COSPAR Colloquium on the Physics of the Outer Heliosphere (Serock, Poland)*, 139-142.
3. LE ROUX, J. A. 1999. The solar wind termination shock and its acceleration of anomalous cosmic rays. *Solar wind 9 Conference, AIP Conference Proceedings*, AIP Press, 471:195-200, **invited talk**.

#### **E. Abstracts in Conference Proceedings**

1. LE ROUX, J. A. & MORAAL, H. 1986. The application of Størmer theory for the calculation of cutoff rigidities (in Afrikaans). *30th Annual South African Institute of Physics Conference (Johannesburg, South Africa)*, Abstract.
2. LE ROUX, J. A. & POTGIETER, M. S. 1988. A numerical model for the propagation of Forbush decreases in the heliosphere (in Afrikaans). *32nd Annual South African Institute of Physics Conference (Grahamstown, South Africa)*, Abstract.
3. POTGIETER, M. S. & LE ROUX, J. A. 1991. The energy-dependence of heliospheric cosmic-ray modulation from 1985-89; a computer simulation. *American Geophysical Union Fall Meeting (San Francisco)*, Abstract.
4. LE ROUX, J. A. & POTGIETER, M. S. 1991. The implication of heliospheric neutral sheet distortion for the long-term modulation of galactic cosmic rays as described by a time-dependent drift model. *American Geophysical Union Fall Meeting (San Francisco)*, Abstract..
5. LE ROUX, J. A. 1992. The simulation of the long-term heliospheric modulation of galactic cosmic rays. *American Geophysical Union Spring Meeting (Montreal)*, Abstract, **invited talk**.
6. LE ROUX, J. A. 1993. The simulation of the 1977-1987 cosmic-ray modulation cycle using a

- drift model with global merged interaction regions. *American Geophysical Union Spring Meeting (Baltimore)*, Abstract.
7. LE ROUX, J. A. & PTUSKIN, V. S. 1993. Mediation of the solar wind by galactic cosmic rays. *Cosmic Winds and the Heliosphere (Tucson)*, Abstract.
  8. LE ROUX, J. A. & PTUSKIN, V. S. 1994. Galactic cosmic ray mediation of a spherical solar wind flow according to a steady state cold gas hydrodynamic approximation. *American Geophysical Union Spring Meeting (Baltimore)*, Abstract.
  9. LE ROUX, J. A. & PTUSKIN, V. S. 1994. Galactic cosmic ray mediation of a spherical solar wind flow according to a steady state magnetohydrodynamic simulation. *Second Pioneer-Voyager Symposium on Energetic Particles and Fields in the Outer Heliosphere (Durham, New Hampshire)*, Abstract.
  10. LE ROUX, J. A. & PTUSKIN, V. S. 1994. Galactic and anomalous cosmic ray modulation models and the declining phase of solar cycle 22. *American Geophysical Union Fall Meeting (San Francisco)*, Abstract, **invited talk**.
  11. FICHTNER, H. & LE ROUX, J. A. 1994. On the transport of pick-up ions in the heliosphere. *American Geophysical Union Fall Meeting (San Francisco)*, Abstract.
  12. LE ROUX, J. A., POTGIETER, M. S. & PTUSKIN, V.S. 1995. The diffusive shock acceleration and modulation of anomalous cosmic rays in the heliosphere. *American Geophysical Union Spring Meeting (Baltimore)*, Abstract.
  13. LE ROUX, J. A. & FICHTNER, H. 1996. Energetic particle mediation of the solar wind termination shock. *American Geophysical Union Spring Meeting (Baltimore)*, Abstract.
  14. LE ROUX, J. A. & FICHTNER, H. 1996. The influence of pickup ions, anomalous and galactic cosmic rays on the structure of the heliospheric shock - a self-consistent approach. *Cosmic Rays in the Heliosphere and Galaxy in honor of William R. Webber (Durham, New Hampshire)*, Abstract, poster.
  15. LE ROUX, J. A. & FICHTNER, H. 1996. The influence of pickup ions, anomalous and galactic cosmic rays on the structure of the heliospheric shock: a self-consistent approach. *American Geophysical Union Fall Meeting (San Francisco)*, Abstract.
  16. PTUSKIN, V. S., ROGOVAYA, S. I., ZIRAKASHVILI, V. N. & LE ROUX, J. A. 1996. The dissipation of interplanetary turbulence by pick-up ions. *American Geophysical Union Fall Meeting (San Francisco)*, Abstract.
  17. LE ROUX, J. A. & PTUSKIN, V. S. 1997. The underabundance of anomalous cosmic rays as described by a self-consistent stochastic acceleration model for pickup ions. *American Geophysical Union Spring Meeting (Baltimore)*, Abstract, oral contribution.
  18. LE ROUX, J. A. 1997. Time-dependent cosmic-ray modulation: Workshop report. *American Geophysical Union Fall Meeting (San Francisco)*, Abstract, **invited talk**.
  19. LE ROUX, J. A. & FICHTNER, H. 1998. Global merged interaction regions, their interaction with the solar wind termination shock, and time-dependent cosmic-ray modulation. *Solar Wind 9 Conference (Nantucket Island, MA)*, Abstract, oral contribution.
  20. LE ROUX, J. A. 1998. The role of global merged interaction regions in the cosmic-ray modulation cycle. *Anomalous and Galactic Cosmic Rays in the Heliosphere Symposium, Durham, New Hampshire*, Abstract, **invited talk**.
  21. LE ROUX, J. A., ZANK, G. P. & MATTHAEUS, W. H. 2000. Quasi-linear Kinetic Theory for the Stochastic Acceleration of Interstellar Pickup Ions by Turbulent Electric Fields, *American Geophysical Union Fall Meeting (San Francisco)*, Abstract, oral contribution.
  22. LE ROUX, J. A. 2000. Anomalous cosmic rays and the solar wind termination shock 2000. *American Geophysical Union Fall Meeting (San Francisco)*, Abstract, **invited talk**.
  23. LE ROUX, J. A., ZANK, G. P., MILANO, L. J. & MATTHAEUS, W. H. 2002. The role of quasi-

- Static 2D and slab turbulence in the pickup ion transport between the Sun and Earth. *International Conference: Particle Acceleration and Transport in Cosmic Plasmas (Lake Arrowhead, California)* Abstract, **invited talk**.
24. LE ROUX, J. A. 2002. The role of quasi-static 2D and slab turbulence in the pickup ion transport between the Sun and Earth. *ACE Team Meeting (Caltech, Pasadena)*, Abstract, **invited talk**.
  25. LE ROUX, J. A., ZANK, G. P., MILANO, L. J. & MATTHAEUS, W. H. 2002. Energetic particle transport and energization in 2D MHD turbulence, *American Geophysical Fall Meeting (San Francisco)*, Abstract, oral contribution.
  26. LE ROUX, J. A., ZANK, G. P., MILANO, L. J. & MATTHAEUS, W. H. 2002. Energetic particle pitch-angle scattering and momentum diffusion in solar wind MHD turbulence, *International Conference: Waves and turbulence in Interplanetary and Interstellar Space: Theory, Observations, and Ramifications (Palm Springs)*, **invited talk**.
  27. LE ROUX, J. A., FICHTNER, H., WEBB, G. M. & ZANK, G. P. 2003. A kinetic theory of energetic particle transport in intermediate-scale compressive velocity fluctuations associated with Ion-acoustic waves, *American Geophysical Fall Meeting (San Francisco)*, Abstract, poster.
  28. VERKHOGLYADOVA, O. P. & LE ROUX, J. A. 2003. Particle diffusion on Vortex structures in the heliosphere, *American Geophysical Fall Meeting (San Francisco)*, Abstract, poster.
  29. ZANK, G. P., LI, G., FLORINSKI, V., WEBB, G. M., LE ROUX, J. A. & MATTHAEUS W. H. 2003. The perpendicular diffusion coefficient for charged particles of arbitrary energy, *American Geophysical Fall Meeting (San Francisco)*, Abstract, poster
  30. LE ROUX, J. A. & FICHTNER, H. 2004. Theory of energetic particle transport during solar maximum activity conditions, *35<sup>th</sup> COSPAR Meeting (Paris)*, Abstract, oral contribution
  31. VERKHOGLYADOVA, O. P & LE ROUX, J. A. 2004. Particle Transport in a Vortex Flow in the Solar Wind, *Western Pacific Geophysics Meeting*, Abstract.
  32. LE ROUX, J. A., ZANK, G. P., LI, G. & WEBB, G. M. 2004. Non-linear cosmic-ray transport in enhanced compressive wave turbulence at the termination shock, *American Geophysical Fall Meeting (San Francisco)*, Abstract, oral contribution.
  33. VERKHOGLYADOVA, O. P & LE ROUX, J. A. 2004. Particle Diffusion in Heliospheric Vortex Flows. *American Geophysical Fall Meeting (San Francisco)*, Abstract, poster.
  34. WEBB, G. M., ZANK, G. P., KAGHASHVILI, E. KH., LE ROUX, J. A. & LI, G. 2004. Compound diffusion of solar energetic particles and field line random walk. *American Geophysical Fall Meeting (San Francisco)*, Abstract, poster.
  35. BAMERT, K., KALLENBACH, R. & LE ROUX, J. A. 2004. Momentum diffusion of suprathermal ions in compressible solar wind turbulence. *American Geophysical Fall Meeting (San Francisco)*, Abstract, poster.
  36. LE ROUX, J. A., & WEBB, G. M. 2005. Shock acceleration of pickup ions with a field-aligned focused transport approach. *American Geophysical Fall Meeting (San Francisco)*, Abstract, poster.
  37. VERKHOGLYADOVA, LE ROUX, J. A., & WEBB, G. M. 2005. Non-linear energetic particle transport in incompressible MHD Turbulence. *American Geophysical Fall Meeting (San Francisco)*, Abstract, poster.
  38. LE ROUX, J. A., & WEBB, G. M. 2006. A focused transport approach to low energy ion acceleration, *SHINE Meeting (Zermatt, Utah)*, Abstract, poster.
  39. ZANK, G. P., FLORINSKI, V., LE ROUX, J. A., WASHIMI, POGORELOV, N., & AO, X. 2006. Revealing the truth about the termination shock: Numerical simulations versus data, *36<sup>th</sup> COSPAR Assembly, Beijing, China*, Abstract.
  40. LE ROUX, J. A., & WEBB, G. M. 2007. Shock acceleration with a focused transport equation. *American Geophysical Spring Meeting (Acapulco, Mexico)*, Abstract, oral contribution.
  41. LE ROUX, J. A. LE ROUX, J. A., & WEBB, G. M. 2007. A BGK-Boltzmann approach to

- nonlinear cosmic-ray diffusive transport in composite 2D and slab turbulence. *American Geophysical Spring Meeting (Acapulco, Mexico)*, Abstract, poster.
42. HEERIKHUISEN, J., POGORELOV, N., FLORINSKI, V., LE ROUX, J., & ZANK, G. P. 2007. Energetic neutral atom distributions observable at 1 AU. *American Geophysical Spring Meeting (Acapulco, Mexico)*, Abstract, poster.
  43. LE ROUX, J. A. 2007. What a time-dependent focused transport equation approach tells us about SEP acceleration at CME-driven shocks, *From the Sun towards the Earth: A Living with a Star Meeting (Colorado, Boulder)*, Abstract, oral contribution.
  44. LE ROUX, J. A. 2008. The Acceleration of Interstellar Pickup Ions at the Heliospheric Termination Shock and in the Heliosheath, *Huntsville Workshop: The Physical Processes for Energy and Plasma Transport across Magnetic Boundaries*, Huntsville, Alabama, October 26-31, 2008, Abstract, **invited talk**.
  45. LE ROUX, J. A. 2008. Stochastic Acceleration of Suprathermal Charged particles by Compressive Wave Turbulence, *AGU Chapman Conference On Universal Heliophysical Processes (Savannah, Georgia)*, **invited talk**.
  46. WEBB, G. M., LE ROUX, J. A., & ZANK, G. P., Guiding center drift kinetic theory and cosmic rays, *Huntsville Workshop: The Physical Processes for Energy and Plasma Transport across Magnetic Boundaries (Huntsville, Alabama)*, October 26-31, 2008, Co-author on invited talk presented by Webb.
  47. WEBB, G. M., KAGASHVILI, E.K., ZANK, G. P., LE ROUX, J. A., AND LI, G., Compound Perpendicular diffusion of cosmic rays, *American Geophysical Fall Meeting (San Francisco)*, 15-18 December, 2008, abstract, Co-author on poster presented by Webb.
  48. LE ROUX, J. A. & WEBB, G. M. 2009. Stochastic Acceleration of Energetic Ions by Compressive Wave Turbulence in the Heliosheath, *Voyagers in the Heliosheath: Observations, Models, and Plasma physics Conference (Kauai, Hawaii)*, 9-14 January, abstract, **invited talk**.
  49. LE ROUX, J. A., FLORINSKI, V., POGORELOV, N. V., & ZANK, G. P. 2009. The acceleration of anomalous cosmic rays by the heliospheric termination shock, *SHINE Meeting (Nova Scotia)*, August 3-7, abstract, **invited talk**.
  50. LE ROUX, J. A. & WEBB, G. M. 2009. A Generalized Nonlinear Guiding Center Theory for Anomalous Cosmic-ray Diffusion, *SHINE Meeting (Nova Scotia)*, August 3-7, abstract, poster.
  51. LE ROUX, J. A., WEBB, G. M., & FLORINSKI, V. 2009. A focused transport approach to the shock acceleration of pickup ions at the termination shock, *Observations and Theories of Suprathermal Tails and Anomalous Cosmic Rays in the Heliosphere and Heliosheath, ISSI Meeting, Bern Switzerland*, August 31- September 4, abstract, **invited talk**.
  52. FLORINSKI, V., ZANK, G. P., DECKER, R. & LE ROUX, J. A. 2009. An energetic-particle Mediated termination shock observed by Voyager 2, *American Geophysical Fall Meeting*, San Francisco, 14-18 December, Co-author on poster presented by Florinski.
  53. LE ROUX, J. A. & G. M. WEBB 2010. Energetic Charged Particle Acceleration at the Heliospheric Termination Shock and in the Heliosheath, *International Workshop: New perspectives on cosmic rays in the heliosphere*, Parys, South Africa, 22-26 March, **invited talk**.
  54. LE ROUX, J. A., WEBB, G. M., SHALCHI, A., & ZANK, G. P. 2010. A Generalized Nonlinear Guiding Center Theory for the Collisionless Anomalous Perpendicular Diffusion of Cosmic Rays, *International Workshop: New perspectives on cosmic rays in the heliosphere*, Parys, South Africa, 22-26 March, Contributed talk.
  55. LE ROUX, J. A. 2010. Energetic Charged Particle Acceleration at the Heliospheric Termination Shock and in the Heliosheath, *COSPAR 38<sup>th</sup> International Assembly*, Bremen, Germany, 18-25 July, abstract, **Invited Talk**.



56. LE ROUX, J. A. 2010. A Generalized Nonlinear Guiding Center Theory for Anomalous Perpendicular Diffusion of Cosmic Rays, *COSPAR 38<sup>th</sup> International Assembly*, Bremen, Germany, 18-25 July, abstract, contributed talk.
57. LE ROUX, J. A. 2010. A Focused Transport Model of the Shock Acceleration of Core Pickup Ions at the Nearly Perpendicular Termination Shock – an update, , *Observations and Theories of Suprathermal Tails and Anomalous Cosmic Rays in the Heliosphere and Heliosheath, ISSI Meeting, Bern Switzerland, May 25-29*, abstract, **invited talk**.
58. LE ROUX, J. A. 2010. A Theory Exploring the Effect of Intermittent Slab Turbulence on Cosmic-ray Transport in Turbulence dominated by a 2D Component, *American Geophysical Fall Meeting*, San Francisco, 13-17 December, abstract, poster.
59. SMITH, B. J., & LE ROUX, J. A. 2010. Interstellar Pickup Ion Acceleration at the Heliospheric Termination Shock, *American Geophysical Fall Meeting*, San Francisco, 13-17 December, abstract, poster.
60. LE ROUX, J. A. 2011, A focused Transport Perspective on Time-dependent Solar Energetic Particle Acceleration at a Traveling Shock, *Physics of the Heliosphere: A 10-year Perspective, 10<sup>th</sup> Annual International Astrophysics Conference*, March 13-18, abstract, **invited talk**.
61. LE ROUX, J. A. 2011, Solar Energetic Particle Acceleration at a Fast Traveling Shock, *Workshop: Cosmic Rays and the Heliospheric Plasma Environment*, Bochum, Germany, September 12-16, abstract online, **invited talk**.
62. LE ROUX, J. A., Modeling the Acceleration and Transport of Solar Energetic Particles at Traveling Shocks using Focused Transport Theory, *Joint Space Weather Camp 2011*, Rostock, Germany and Huntsville, July 17-August 14, 2011.
63. WEBB, G. M., HU, Q., LE ROUX, J. A., DASGUPTA, B., & ZANK, G. P. 2011, Simple and Double Alfvén waves: Hamiltonian Aspects, *American Geophysical Fall Meeting*, San Francisco, 13-17 December, abstract, co-author on poster of Webb.
64. ALOUANI BIBI, F., & LE ROUX, J. A. 2011, Transport of Cosmic rays in the Inner Heliosphere in the Presence of Composite Two-dimensional and Slab Turbulence, *American Geophysical Fall Meeting*, San Francisco, 13-17 December, abstract, co-author on poster presented by Alouani Bibi.
65. LE ROUX, J. A., & WEBB, G. M. 2011, A Focused Transport Model for the Shock Pre-Heating, Injection and First Order Fermi Acceleration of Solar Wind Source Particles at a Fast Traveling Shock, *American Geophysical Fall Meeting*, San Francisco, 13-17 December, abstract, poster.
66. FLORINSKI, V. A., ALOUANI BIBI, F, GUO, X., ZANK, G. P., & LE ROUX, J. A. 2011, a New Concept of Cosmic Ray Diffusion in the Heliosheath, *American Geophysical Fall Meeting*, San Francisco, 13-17 December, abstract, co-author on oral contribution.
67. LE ROUX, J. A. 2011, Modeling the Acceleration and Transport of Solar Energetic Particles at Traveling Shocks using Focused Transport Theory, *Joint Space Weather Camp 2011*, July 17-August 14, Rostock, Germany and Huntsville, abstract, **invited talk**.
68. WEBB, G. M., MCKENZIE, J. F., HU, Q., LE ROUX, J. A., & ZANK, G. P. 2012, Alfvén Wave Mixing, *Space Weather: The Space Radiation Environment, Annual International Astrophysics Conference*, March 19-23, poster.
69. ALOUANI-BIBI, F., & LE ROUX, J. A. 2012, Diffusion of Energetic Charged Particles in Heliospheric Composite and Intermittent Slab Turbulence, *Space Weather: The Space Radiation Environment, Annual International Astrophysics Conference*, Palm Springs, March 19-23, abstract.

70. LE ROUX, J. A., & WEBB, G. M. 2012, A Focused Transport Model of Solar Energetic Particle Acceleration at a Fast Traveling Shock with Varying Shock Obliquity, *Space Weather: The Space Radiation Environment, Annual International Astrophysics Conference*, Palms Springs, March 19-23, abstract, **invited talk**.
71. LE ROUX, J. A., & WEBB, G. M. 2012, A Focused Transport Approach to SEP acceleration at a Fast Parallel Shock in the Corona Including Self-excitation of Alfvén Waves, *American Geophysical Fall Meeting*, San Francisco, 3-7 December, abstract, poster.
72. ALOUANI-BIBI, F., & LE ROUX, J. A. 2012, Diffusion of Energetic Charged Particles in Intermittent q- Gaussian turbulence, *American Geophysical Fall Meeting*, San Francisco, 3-7 December, abstract, poster.
73. AARON, D. A., LE ROUX, J. A., & ALOUANI BIBI, F. 2012, A Legendre Expansion Model for the Focused Transport and Acceleration of Solar Energetic Particles, *American Geophysical Fall Meeting*, San Francisco, 3-7 December, **abstract (my Ph. D. student)**, poster, 2012.
74. DAVIS, N., ALOUANI BIBI, & LE ROUX, J. A. 2012, Simulation of charged particle trajectories across an interplanetary shock, *American Geophysical Fall Meeting*, San Francisco, 3-7 December, **abstract (undergraduate student)**, poster.
75. LE ROUX, J. A. 2013, Acceleration of stellar energetic particles by interplanetary travelling shocks, WE-Heraeus-Seminar on “Plasma and Radiation Environment in Astrospheres and Implications for the Habitability of Extrasolar Planets, Physikzentrum Bad Honnef, Germany, 10 – 15 March, **invited talk**.
76. LE ROUX, J. A. 2013, Solar Energetic Particles Acceleration at Fast Coronal Mass Ejection Driven Shocks, *12th Annual International Astrophysics Conference*, Myrtle Beach, South Carolina, 15-19 April, **invited talk**.
77. LE ROUX, J. A. & ZANK, G. P. 2014, Energetic Charged Particle Acceleration at the Inner Heliosheath Heliospheric Current Sheet, ISSI Meeting, Bern, Switzerland, 13-17 January, **invited talk**.
78. LE ROUX, J. A. 2014, Non-diffusive Energetic Particle Transport in Intermittent Turbulence and at Shocks in the Heliosphere, ISSI Meeting, Bern, Switzerland, 10-14 February, **invited talk**.
79. LE ROUX, J. A., ZANK, G. P. & WEBB 2014, Transport and Acceleration in Multiple Contracting and Reconnecting Inertial-scale Flux Ropes in the Solar Wind, *SHINE Meeting*, Telluride, CO, June, poster.
80. LE ROUX, J. A., ZANK, G. P. & WEBB 2014, Superthermal Ion Transport and Acceleration in Multiple Contracting and Reconnecting Inertial-scale Flux Ropes in the Solar Wind, *56th Annual Meeting of APS Division of Plasma Physics*, New Orleans, October, **invited talk**.
81. LE ROUX, J. A., ZANK, G. P. & WEBB, G. M. 2014, Superthermal Charged Particle Transport and Acceleration in Multiple Contracting and Merging Flux Ropes, *ISSI Meeting*, Bern, Switzerland, November, **invited talk**.
82. LE ROUX, J. A., & ALOUANI-BIBI, F. 2014, Energetic Charged Particle Transport in Intermittent q-Gaussian Magnetic field Turbulence, AGU Fall Meeting, San Francisco, 9-13 December, **contributed talk**.
83. LE ROUX, J. A., ZANK, G. P. & WEBB, G. M. 2014, Suprathermal Ion Acceleration in Multiple Contracting & Reconnecting Inertial-scale Flux Ropes in the Supersonic Solar Wind, *AGU Fall Meeting*, San Francisco, December, poster.
84. LE ROUX, J. A., ZANK, G. P. & WEBB, G. M. 2015, A Kinetic Transport Theory for Energetic Particle Acceleration in Solar Wind Regions with Multiple Contracting and Reconnecting Small-scale Flux Ropes, *14th Annual International Astrophysical Conference*, Tampa Bay, Florida, April, **invited talk**.
85. LE ROUX, J. A., WEBB, G. M. & ZANK, G. P. 2015, Suprathermal Particle Acceleration by Small-



- scale Flux Ropes, *New Paradigms for the Heliosphere Conference*, Bad Honnef, Germany, June, **invited talk**.
86. LE ROUX, J. A. & WEBB, G. M. 2015, Suprathermal Particle Acceleration by Small-scale Flux Ropes, *SHINE Meeting*, Stowe, Vermont, July, contributed poster.
  87. LE ROUX, J. A. 2015, Particle Transport in Coherent Structures behind Shocks, *ISSI Meeting*, Bern, Switzerland, November, **invited talk**.
  88. LE ROUX, J. A., ZANK, G. P. & WEBB, G. M. 2015, Suprathermal Charged Particle Acceleration by Small-scale Flux Ropes at Heliospheric Shocks, *American Geophysical Fall Meeting Fall Meeting*, San Francisco, California, December, Poster.
  89. LE ROUX, J. A., ZANK, G. P., KHABAROVA, O. V., WEBB, G. M. 2016, A Theory for Self-consistent Acceleration of Energetic Charged Particles by Dynamic Small-scale Flux Ropes, *AGU Fall Meeting*, San Francisco, December, Contributed Poster.
  90. LE ROUX, J. A., G. M. WEBB, ZANK, G. P. & KHABAROVA, O. V. 2016. Diffusive Shock Acceleration Coupled with Downstream Acceleration of Energetic Particles by Small-scale Flux Ropes at Heliospheric shocks. *15th Annual International Astrophysics Conference*, Cape Coral, April, **invited talk**.
  91. LE ROUX, J. A. & ARTHUR, A. D. 2017, Solar Energetic Particle Acceleration at a Fast Traveling Shock in Typical Highly Nonuniform Coronal Conditions, *Astrophysical Processes in the Heliosphere Conference*, Northwest University, Potchefstroom, South Africa, March, **invited talk**.
  92. LE ROUX, J. A. & ARTHUR, A. D. 2017, Acceleration of Solar Energetic Particles at a Fast Traveling Shock in Nonuniform Coronal Conditions, *16th Annual International Astrophysics Conference*, Santa Fe, New Mexico, March, **invited talk**.
  93. LE ROUX, J. A. 2017. A Kinetic-MHD Theory for the Self-Consistent Energy Exchange Between Energetic Particles and Active Small-scale Flux Ropes *Fall AGU Meeting*, New Orleans, December, Contributed talk.
  94. LE ROUX, J. A., ZANK, G. P. & WEBB, G. M. 2018. Investigation of Different Dynamic Small-scale Flux-rope Acceleration Scenarios near Earth. *17th Annual International Astrophysics Conference*, Santa Fe, New Mexico, March 2018, **invited talk**.
  95. LE ROUX, J. A., KHABAROVA, O. V., ZANK, G. P. & WEBB, G. M. 2018. Evaluation of Competing dynamic small-scale flux-rope acceleration scenarios for energetic protons near Earth. *42nd COSPAR Scientific Assembly*, Pasadena, California, July, Abstract id. D1.3-4-18, contributed talk.
  96. LE ROUX, J. A. 2018. The effect of magnetic turbulence on pitch-angle anisotropies of interstellar pickup ions accelerated by the solar wind termination shock, *42nd COSPAR Scientific Assembly*, July, Pasadena, California, Abstract id. D1.1-11-18, contributed talk.
  97. LE ROUX, J. A. 2019. Latest Developments in Energetic Particle Acceleration by Contracting and Reconnecting Small-scale Flux-ropes in the Inner Heliosphere. *EGU Spring Meeting*, Vienna, May, abstract, **invited talk**.
  98. CHEN, Y., HU, Q., & LE ROUX, J. A. 2019. Effects of Radial Distances on Small-scale Magnetic Flux Ropes. *Solar Heliospheric and Interplanetary Environment (SHINE 2019)*, Boulder, Colorado, August, abstract, poster
  99. THOMPSON, N. C., & LE ROUX, J. A. 2019. Modeling Energetic Particle Acceleration by Small-Scale Flux Ropes at 1 AU. *AGU Fall Meeting*, San Francisco, December, abstract, contributed poster.
  100. LE ROUX, J. A., WEBB, G. M., KHABAROVA, O. V., & ZANK, G. P. 2019. Acceleration of Suprathermal Ions by Dynamic Small-scale Flux Ropes in the Inner Heliosphere. *AGU Fall Meeting*, San Francisco, December, abstract, contributed poster.

101. LE ROUX, J. A., WEBB, G. M., & KHABAROVA, O. V. 2020. Modeling Energetic Particle Acceleration and Transport in a Solar Wind Region with Dynamic Small-Scale Flux Ropes at 1 AU. *19th Annual International Astrophysics Conference*. Santa Fe, NM, March, abstract, **invited talk**.
102. LE ROUX, J. A., ZANK, G. P., & DU, S. 2020. A Fractional Kinetic Transport Theory for Energetic Particle Acceleration and Propagation in Dynamic Small-scale Flux Rope Regions in the Solar Wind. *AGU Fall Meeting*, San Francisco, December, abstract, contributed talk. poster.

#### **F. Other Publications**

1. LE ROUX, J. A. 1986. The application of Størmer theory for the calculation of cutoff rigidities of cosmic rays in the geomagnetic field (in Afrikaans). *M.Sc. thesis (PU for CHE, Potchefstroom, South Africa)*.
2. LE ROUX, J. A. 1990. The solar modulation of galactic cosmic rays as described by a time-dependent drift model. *Ph.D. thesis (PU for CHE, Potchefstroom, South Africa)*.
3. LE ROUX, J. A., FLORINSKI, V., ZANK, G. P. & COATES, A. J. Editors 2010. Pickup ions throughout the heliosphere and beyond, *Proceedings of the 9th Annual International Astrophysics Conference*, Maui, Hawaii, March 14-19, 1302.