Hilding R. Neilson

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Citizenship: Canadian

Profile

I am a researcher with a strong record of advancing our understanding of the physics of stars, from the nuclear-burning core out to the circumstellar medium where stellar winds interact with the interstellar medium. I exploit theoretical and numerical tools to compare with observational data sets to further this goal. More specifically, I study stellar evolution, structure and atmospheres of massive stars including classical Cepheid stars, red giant and supergiant stars. I am also interested in low-mass planet-hosting stars and their atmospheres and the connections between measured star and planet properties. I am experienced with and enjoy teaching at the undergraduate and graduate level as well as participating in public outreach and science communication.

Experience

ASSISTANT PROFESSOR (CLTA), UNIVERSITY OF TORONTO 2014 - PRESENT

Limited-term appointment faculty in the Department of Astronomy & Astrophysics at the University of Toronto.

ADJUNCT FACULTY, EAST TENNESSEE STATE UNIVERSITY 2014 - 2015

Adjunct faculty position in the Department of Physics & Astronomy at East Tennessee State University.

RESEARCH ASSISTANT PROFESSOR, EAST TENNESSEE STATE UNIVERSITY 2013 - 2014

Research scientist position in the Department of Physics & Astronomy at East Tennessee State University.

POSTDOCTORAL RESEARCH SCIENTIST, EAST TENNESSEE STATE UNIVERSITY 2012 - 2013

Postdoctoral research position in the Department of Physics & Astronomy at East Tennessee State University with Prof. Richard Ignace.

ALEXANDER VON HUMBOLDT FELLOW, ARGELANDER INSTITUTE FOR ASTRONOMY 2010 - 2012

Independent postdoctoral research fellowship (funded by the Alexander von Humboldt Foundation) in the Stellar Physics Research Group at the Argelander Institute for Astronomy led by Prof. Norbert Langer.

ARGELANDER FELLOW, ARGELANDER INSTITUTE FOR ASTRONOMY 2009 - 2010

Postdoctoral research fellowship in the Stellar Physics Research Group at the Argelander Institute for Astronomy supervised by Prof. Norbert Langer.

SESSIONAL INSTRUCTOR, UNIVERSITY OF TORONTO MISSISSAUGA JAN - MAY 2009

Lecturer for Astronomy 201: Introduction to Stars & Galaxies for non-science students.

Education

University of Toronto, PhD in Astronomy & Astrophysics, Toronto, 2009
Dissertation: *The Dynamic Atmospheres of Classical Cepheids: Studies of Atmospheric Extension, Mass Loss, & Shocks*
Supervisor: Professor John B. Lester

St. Mary's University, BSc Honors in Mathematics & Astrophysics, Halifax, 2003

Pasadena Academy High School, Diploma, Pasadena, 1998

Teaching Experience

• University of Toronto, 2015 - 2016

• AST251: Life on other worlds - science elective course for science students about the prospects for finding life beyond the Earth.

• AST210: Great moments in astronomy - astronomy elective course for science students with an emphasis on the scientific method from the perspective of the great astronomical discoveries from the heliocentric model of the solar system to the expansion and acceleration of the Universe.

• PMU199: Physics and Math of the Universe - an introductory seminar course for first-year students. The course explored various topics in astronomy where students researched questions in each lecture and presented results to other students.

• University of Toronto, 2014 - 2015

• AST251: Life on other worlds - see above

• AST222: Galaxies and Cosmology - core astrophysics course for second-year students introducing the study of galaxies from the Milky Way and beyond, including topics on galactic structure and evolution. The second part introduces cosmology with discussion about the Big Bang, cosmic microwave background and questions about dark matter and dark energy.

• PMU199: Physics and Math of the Universe - see above

• Participated in workshop "2014 ETSU STEM Conference", May 29-30, 2014

• Participated in teaching workshop "Teaching Every Student: ASTRO 101 Approaches for Diverse Audiences" at the 221st Meeting of the AAS, January 2013

• Teaching assistant for Graduate Astronomy Course in Science Writing led by Prof. Rob Izzard at the University of Bonn, Spring 2012

• Guest Lecturer for Graduate Astronomy Course on Stellar Evolution at the University of Bonn, Fall 2010 & Fall 2011

• Lecturer for Astronomy 201 (Introductory Astronomy for non-science students) at University of Toronto at Mississauga, Winter 2009

• Teaching Assistant at University of Toronto at Mississauga, 2006 - 2008

• Teaching Assistant at University of Toronto, 2003 - 2008

• Teaching Assistant at St. Mary's University, 2002 - 2003

Undergraduate Student Supervision

• Mateus Santos, University of Toronto, Summer 2015: "*Stars eating planets: predicting spectral signatures from model stellar atmospheres*"

• Yuan (Chris) Ni, University of Toronto, 2015 - 2016: "*Pulsation and Evolution of the Ultra-Long-Period Cepheids*"

• J.T. McNeil, East Tennessee State University, 2013 - 2015: "*Testing Model Stellar Atmospheres with Planetary Transit Observations*"

• poster presented at the 223rd meeting of the AAS, Washington D.C., USA, 5 - 9 January 2014

Research Grants & Observing Proposals

• Gemini Telescope 2016B, submitted, Neilson, H.R. (P.I.), Engle, S., Evans, N.R., Guinan, E., Hoffman, J., Ignace, R., Lester, J.B. Marengo, M., Matthews, L.D., Millar-Blanchaer, M., Shrestha, M., & Welch, D. *Resolving the inner circumstellar medium of Cepheids: the answer is blowing in the wind*.

• Chandra Space Telescope Cycle 18, 2016, submitted, Evans, N.R. (P.I.), **Neilson, H.R. (Co-I)**, Engle, S., & Guinan, E. *Cepheids: The first rung on the cosmic distance ladder: Part I: V473 Lyr*

• Canada-France-Hawaii Telescope LP 2016, submitted, Neiner, C. (P.I.), Wade, G. (co-P.I) + 43 others including **Neilson, H.R.**, *LIFE: The large impact of magnetic fields on the evolution of hot stars*

• CHARA Interferometer for period May 16 - December 23, 2016, submitted, Nardetto, N. (P.I.), Maraud, A., Mourard, D., Kervella, P., Gallenne, A., Breitfelder, J., Poretti, E., **Neilson, H.R. (Co-I)**, et al. *The visible environment of Cepheids with VEGA/CHARA*

• Hubble Space Telescope Cycle 23, 2015, declined, Guinan, E. (P.I.), Engle, S., & **Neilson, H.R. (Co-I)** *The secret lives of Cepheids: Hubble Variable V19 in M33 - a Cepheid no more?*

• Hubble Space Telescope Cycle 23, 2015, declined, Engle, S. (P.I.), Guinan, E. (Co-P.I.), Harper, G., **Neilson, H.R. (Co-I)**, & Evans, N.R. *Stellar atmospheres of the instability strip: surveying Cepheids and yellow supergiants with HST-COS*

• Kepler K2 Space Observatory 2015, accepted, Molnár, L. (P.I.), Szabó, R., **Neilson, H.R. (Co-I)**, Evans, N.R., & Szabados, L, + KASC WG#7 members, *Sampling the Cepheid instability strip with K2*

• XMM-Newton X-ray Observatory 2014, accepted, Guinan, E. (P.I.), Engle, S., **Neilson, H.R. (Co-I)**, Harper, G., & Evans, N.R. *Exposing the secret X-ray lives of Cepheids with XMM-Newton*

• XMM-Newton X-ray Observatory 2014, accepted, Oskinova, L. (P.I.), Balona, L., Hamann, W.-R., Hubrig, S., Huemoerder, D., Ignace, R., **Neilson, H.R. (Co-I)**, & Todt, H. X-ray pulsations of massive stars: *XMM opens a new door to stellar physics*

• Kepler K2 Space Observatory 2014, accepted, Molnár, L. (P.I.), Szabó, R., Kolenberg, K., Plachy, E., Moskalik, P., Ngeow, C.-C., Kuehn, C., Jeon, Y.-B., Evans, N.R., **Neilson, H.R. (Co-I)**, Derekas, A., + KASC WG#7 members, *Classical and Type II Cepheids in the C4 and C5 fields of the K2 mission*

• Chandra X-ray Observatory Cycle 16 2014, accepted, Huenemoerder, D.P. (P.I.), Oskinova, L., Hamann, W.-R., Ignace, R., Schulz, N., & **Neilson, H.R. (Co-I)**, *A Deep X-ray Look at a Very Massive Star: HETGS Spectroscopy of the Blue Hypergiant HIP 101364* - $56,366

• NASA Astrophysics Theory Program 2014, declined. **Neilson, H.R. (P.I.)**, Ignace, R., *Pulsation, Evolution and Stellar Physics of Cepheids in the Yellow Void of the HR Diagram* - Grant - $546,381

• Very Large Array 2014 Semester B, accepted, Matthews, L. (P.I), **Neilson, H.R**. **(Co-I),** Marengo, M., & Evans, N.R. *A Search for Mass Loss from Cepheid Variables*

• Lulin Optical Telescope 2013, **Neilson, H.R.** (**P.I.**), Ngeow, C.-C., Ignace, R., Henson, G., Adams, A., & Luttermoser, D. *Polarization of Mira Variable Stars: Constraints on stellar structure*

• Lulin Optical Telescope 2013, **Neilson, H.R.** (**P.I.**), Ngeow, C.-C., Guinan, E., Engle, S., & Ignace, R. *What drives a Cepheid wind -- Constraints from polarization observations*

• Alexander von Humboldt Fellowship 2010 - Grant - 73,200€

Awards

• Highlighted article in Astronomy & Astrophysics Issue 537

• Finalist for best poster at Cool Stars 16, Seattle, USA. August 29 - September 2, 2010

• Alexander von Humboldt Fellowship (2010)

• Michael Fieldus Memorial Award (2008),

• Walter John Helm Government of Ontario Graduate Scholarship in Science & Technology (2005, 2006)

• Walter C. Sumner Memorial Fellowship (2005, 2006)

• University of Toronto Fellowship (2003, 2004, 2005, 2006)

• C.A. Chant Fellowship (2003)

• St. Mary's University Undergraduate Academic Scholarship (2000, 2001, 2002)

• Canadian Millennium Scholarship (2000, 2001, 2002)

• National Science & Engineering Research Council Undergraduate Summer Research Scholarship (2002)

Scientific Activities and Community Service

• Member of the Science Team for the CHFT proposed large program *LIFE*: *The large impact of magnetic fields on the evolution of hot stars*

• Serving on the science review panel for NRAO 2016-2017

• Member of the Kepler Space Telescope working group on Cepheids and RR Lyrae Stars

• Served on review panel for NASA Astrophysics Data Analysis Program, 2015

• Served as reviewer for the Polish Science Centre, 2015

• Served as referee for the journals: Astronomy & Astrophysics, the Astronomical Journal, the Astrophysical Journal Letters, the Astrophysical Journal, Monthly Notices of RAS and Astrophysics & Space Science

• Participated in workshop "Leadership and Team-Building for Astronomers" at the 223rd meeting of the AAS, 5 - 9 January 2014

• Served as reviewer for Austrian Science Fund, 2013, 2014

• Served on review panel for NASA graduate fellowships, 2013

• Member of the American Astronomical Society (AAS), 2011 - present

• Member of the Canadian Astronomical Society (CASCA), 2005 - present

• President of the Graduate Astronomy Student Association at the University of Toronto, 2006 - 2007

• Treasurer for the Graduate Astronomy Student Association at the University of Toronto, 2004 - 2006

Public Outreach

• Talk given at "Astronomy on Tap" Toronto, February 11, 2016

• Volunteer for the Total Lunar Eclipse event hosted at University of Toronto, September 27, 2015

• Talk given at "Astronomy on Tap" Toronto, September 24, 2014

• Invited talk at Bays Mountain StarFest, Oct. 12 - 14, 2012 on "*Watching the North Star Age"*

• I have given many popular lectures for the monthly astronomy tour at the University of Toronto (2003 - 2009)

Refereed Publications

1. **Neilson, H.R.**; McNeil, J.T.; Ignace, R.; & Lester, J.B. *Limb Darkening and Planetary Transits: Testing Center-to-limb Intensity Variations and Limb-Darkening Directly from Model Stellar Atmospheres*, 2016, ApJ, submitted

2. Nardetto, N.; Mérand, A.; Mourard, D.; Storm, J.; Gieren, W.; Fouqué, P.; Gallenne, A.; Kervella, P.; **Neilson, H.R.**; Pietrzynski, G.; Pilecki, B.; Breitfelder, J.; Berio, P.; Challouf, M.; Clausse, J.-M.; Ligi, R.; Mathias, P.; Meilland, A.; Perraut, K.; Poretti, E.; Reiner, M.; Spang, A.; Stee, P.; Tallon-Bosc, I.; & ten Bummelaar, T. *VEGA/CHARA interferometric observations of Cepheids I. A resolved structure around the prototype classical Cepheid δ Cep in the visible spectral range*, 2016, A&A, submitted

3. **Neilson, H.R.**; Baron, F.; Norris, R.; Kloppenberg, B.; & Lester, J.B. *Stellar atmospheres, atmospheric extension & weighing stars using the stellar mass index*, 2016, ApJ, submitted

4. Moon, D.-S.; Sliwa, K.; Kim, H.-J.; Ma, M.; Kaplan, D.L.; Matzner, C.D.; **Neilson, H.R.**; Harrison, F.A.; Lee, J.-E.; Reach, W.T.; Koo, B.-C.; & Rahman, M. *Dust formation in the massive X-ray binary X1908+075*, 2016, ApJ, submitted

5. **Neilson, H.R.**; Bisol, A.C.; Guinan, E.; Engle, S.G.; & Butterworth, X. *The secret lives of Cepheids: evolution, mass loss and ultraviolet observations of the long-period classical Cepheid l Carinae*, 2016, ApJ, in press

6. **Neilson, H.R.**; & Ignace, R. *Period change and evolution of β Cephei stars*, 2015, A&A, 584, 58

7. **Neilson, H.R.**; Izzard, R.I.; Langer, N.; & Ignace, R. *The strange evolution of the Large Magellanic Cloud Cepheid OGLE-LMC-CEP1812*, 2015, A&A, 581, 1

8. **Neilson, H.R.**; Schneider, F.R.N.; Izzard, R.G.; Evans, N.R.; & Langer, N. *The occurrence of classical Cepheids in binary systems*, 2015, A&A, 574, 2

9. Lomax, J.R.; Nazé, Y.; Hoffman, J.L.; Russell, C.M.P.; De Becker, M.; Corcoran, M.F.; Davidson, J.W.; **Neilson, H.R.**; Owocki, S.; Pittard, J.M.; & Pollock, A.M.T. *V444 X-ray and polarimetric variability: radiative and coriolis forces shape the wind collision region*, 2015, A&A, 573, 43

10. Engle, S.G.; Guinan, E.F.; Harper, G.M.; **Neilson, H.R.**; & Evans, N.R. *The secret lives of Cepheids: evolutionary changes and pulsation-induced shock heating in the prototype classical Cepheids δ Cep*, 2014, ApJ, 794, 80

11. Mackey, J.; Mohamed, S.; Gvaramadze, V.; Kotak, R.; Langer, N.; Meyer, D.M.-A.; Moriya, T.; & **Neilson, H.R.** *Interacting supernovae from photoionization-confined shells around red supergiants*, 2014, Nature, 512, 282

12. **Neilson, H.R**.; Ignace, R.; Smith, B.J.; Henson, G.; & Adams, A.M. *Evidence of a Mira-like tail and bow shock about the semi-regular variable V CVn from four decades of polarization measurements*, 2014, A&A, 568, 88

13. **Neilson, H.R.**; & Ignace, R. *Convection, granulation and period jitter in classical Cepheids*, 2014, A&A, 563, 4

14. **Neilson, H.R.** *Revisiting the fundamental properties of the Cepheid Polaris using detailed stellar evolution models*, 2014, A&A, 563, 48

15. Baron, F.; Monnier, J.D.; Kiss, L.L.; **Neilson, H.R.**; Zhao, M.; Anderson, M.; Aarnio, A.; Pedretti, E.; Thureau, N.; ten Brummelaar, T.A.; Ridgway, S.T.; McAlister, H.A.; Sturmann, J.; Sturmann, L.; & Turner, N. *CHARA/MIRC observations of two M supergiants from the Perseus double cluster: temperature, bayesian modeling and compressed sensing imaging*, 2014, ApJ, 785, 46

16. **Neilson, H.R.**; & Lester, J.B. *Spherically-symmetric model stellar atmospheres and limb darkening II: limb-darkening laws, gravity-darkening coefficients and angular diameter corrections for FGK dwarf stars*, 2013, A&A, 556, 86

17. **Neilson, H.R.**; & Lester, J.B. *Spherically-symmetric model stellar atmospheres and limb darkening I: limb-darkening laws, gravity-darkening coefficients and angular diameter corrections for red giant stars*, 2013, 554, 98

18. Lester, J.B.; Dinshaw, R.; & **Neilson, H.R.** *Indicators of mass in spherical stellar atmospheres*, 2013, PASP, 125, 335

19. **Neilson, H.R**.; Langer, N.; Engle, S.G.; Guinan, E.; & Izzard, R. *Classical Cepheids require enhanced mass loss*, 2012, ApJ, 760L, 18

20. Lebzelter, T.; Heiter, U.; Abia, C.; Eriksson, K.; Ireland, M.; **Neilson, H.R.**; Nowotny, W.; Maldonado, J.; Merle, T.; Peterson, R.; Plez, B.; Short, C.I.; Wahlgren, G.M.; Worley, C.; Aringer, B.; Bladh, S.; de Laverny, P.; Goswami, A.; Mora, A.; Norris, R.P.; Recio-Blanco, A.; Scholz, M.; Thevenin, F.; Tsuji, T.; Kordopatis, G.; Montesinos, B.; & Wing, R.F. *Comparative modelling of the spectra of cool giants*, 2012, A&A, 547, 108

21. **Neilson, H.R.**; & Lester, J.B. *Using limb darkening to measure fundamental parameters of stars*, 2012, A&A, 544, 117

22. Ngeow, C.-C.; **Neilson, H.R.**; Nardetto, N.; & Marengo, M. *Calibrating the projection factor for Galactic Cepheids*, 2012, A&A, 543, 55

23. Mackey, J.; Mohamed, S.; **Neilson, H.R**.; Langer, N.; & Meyer, D.M.-A. *Double bow shocks around young, runaway red supergiants: application to Betelgeuse*, 2012, ApJ, 751L, 10

24. **Neilson, H.R.**; Nardetto, N.; Ngeow, C.-C.; Fouqué, P.; & Storm, J. *Cepheid limb darkening, angular diameter corrections and projection factor from static spherical model stellar atmospheres*, 2012, A&A, 541, 134

25. **Neilson, H.R.**; Engle, S.G.; Guinan, E.; Langer, N.; Wasatonic, R.P.; & Williams, D.B. *The period change of the Cepheid Polaris suggest enhanced mass loss*, 2012, ApJ, 745L, 32

26. **Neilson, H.R**; & Langer, N. *Is there a mass discrepancy in the Cepheid binary OGLE-LMC-CEP0227?*, 2012, 537, 26

27. Croll, B.; Albert, L.; Jayawardhana, R.; Miller-Ricci Kempton, E.; Fortney, J.J.; Murray, N.; & **Neilson, H.R.** *Broadband transmission spectroscopy of the super-earth GJ 1214b suggests a low mean molecular weight atmosphere*, 2011, ApJ, 736, 78

28. **Neilson, H.R.** & Lester, J.B. *Limb darkening in spherical stellar atmospheres*, 2011, A&A, 530, 65

29. **Neilson, H.R.**; Cantiello, M.; & Langer, N. *The Cepheid mass discrepancy and pulsation-driven mass loss*, 2011, A&A, 529L, 9

30. Ngeow, C.-C.; Ita, Y.; Kanbur, S.M.; **Neilson, H.R.**; Onaka, T.; & Kato, D. *Cepheid period-luminosity relation from the AKARI observations*, 2010, MNRAS, 408, 983

31. **Neilson, H.R.**; Ngeow, C.-C.; Kanbur, S.M.; & Lester, J.B. *Testing mass loss in Large Magellanic Cloud Cepheids using infrared and optical observations II. predictions and tests of the OGLE-III fundament-mode Cepheids*, 2010, ApJ, 716, 1136

32. Ngeow, C.-C.; Kanbur, S.M.; **Neilson, H.R.**; Nanthakumar, A.; & Buonaccorsi, J. *Period-luminosity relations derived from the OGLE-III fundamental mode Cepheids,* 2009, ApJ, 693, 691

33. **Neilson, H.R.**; Ngeow, C.-C.; Kanbur, S.M.; & Lester, J.B. *Testing mass loss in Large Magellanic Cloud Cepheids using infrared and optical observations*, 2010, ApJ, 692, 81

34. **Neilson, H.R.** & Lester, J.B. *On the enhancement of mass loss in Cepheids due to radial pulsation II. the effect of metallicity*, 2009, ApJ, 690, 1829

35. Lester, J.B. & **Neilson, H.R.** *SATLAS: spherical versions of the ATLAS stellar atmosphere program*, 2008, A&A, 491. 633

36. **Neilson, H.R**. & Lester, J.B. *Determining parameters of cool giant stars by modeling spectrophotometric and interferometric observations using the SATLAS program*, 2008, A&A, 490, 807

37. **Neilson, H.R.** & Lester, J.B. *On the enhancement of mass loss in Cepheids due to radial pulsation*, 2008, ApJ, 684, 569

Non-Refereed Publications

1. **Neilson, H.R.**; Bisol, A.C.; Guinan, E.; & Engle, S.G. *Pulsation period change & classical Cepheids: probing the details of stellar evolution*, 2015, IAUS, 307, 224

2. Mackey, J.; Langer, N.; Meyer, D.M.-A.; Gvaramadze, V.V.; Mohamed, S.; **Neilson, H.R.**; & Mignone, A. *The circumstellar medium of massive stars in motion*, 2014, NIC Symposium, ArXiv: 1406.0878

3. Mackey, J.; Langer, N.; Mohamed, S.; Gvaramadze, V.V.; **Neilson, H.R**.; & Meyer, D.M.-A. *Effects of stellar evolution and ionizing radiation on the environments of massive stars*, 2014, ASTRA proceedings, 1, 61

4. **Neilson, H.R.**; Biesiada, M.; Remage Evans, N.; Marconi, Marcella, Ngeow, C.-C.; & Reese, D.R. *Asteroseismology, standard candles, and the Hubble Constant: what is the role asteroseismology in the era of precision cosmology?*, 2014, IAUS, 301, 233

5. **Neilson, H.R.**; Ignace, R.; & Henson, G.D. *Long-term polarization observations of Mira variable stars suggest asymmetric structures*, 2014, IAUS, 301, 463

6. **Neilson, H.R.** *Pulsation and mass loss across the HR diagram: from OB stars to Cepheids to red supergiants*, 2013, 2014, IAUS, 301, 205

7. **Neilson, H.R.**; Ignace, R.; Shrestra, M.; Hoffman, J.L.; & Mackey, J. *Modeling near-IR polarization to constrain stellar wind bow shocks*, 2013, MSAO.confE.172

8. Mackey, J.; Mohamed, S.; **Neilson, H.R**.; Langer, N.; & Meyer, D.M.-A. *Numerical models for the circumstellar medium around Betelgeuse*, 2013, EAS Publication Series, 60, 253

9. Ngeow, C.-C.; **Neilson, H.R.**; Nardetto, N.; & Marengo, M. *Wesenheit function for Galactic Cepheids: application to the projection factors*, 2013, IAUS, 289, 134

10. Armstrong, J.T.; Jorgensen, A.M.; **Neilson, H.R.**; Mozurkewich, D.; Baines, E.K.; & Schmitt, H.R. Precise stellar diameters from coherently averaged visibilities, 2012, SPIE, 8445, 3K

11. **Neilson, H.R.** *Comparison of limb-darkening laws from plane-parallel and spherically-symmetric model stellar atmospheres*, 2012, IAUS, 282, 243

12. **Neilson, H.R.**; Ngeow, C.-C.; & Lester, J.B. *Constructing a Cepheid period p-factor relation from static model stellar atmospheres*, 2012, ArXiv:1201.0802

13. **Neilson, H.R.**; Langer, N.; Cantiello, M. *Stellar evolution with pulsation-driven mass loss: the case of LMC Cepheids*, 2011, ASPC, 451, 327

14. **Neilson, H.R.**; Lester, J.B.; & Haubois, X. *Weighing Betelgeuse: measuring the mass of α Orionis from stellar limb-darkening*, 2011, ASPC, 451, 117

15. **Neilson, H.R.**; Cantiello, M.; & Langer, N. *Convective core overshoot and mass loss in classical Cepheids: a solution to the mass discrepancy?*, 2011, ASPC, 448, 155

16. **Neilson, H.R.**; & Lester, J.B. *Using limb-darkening to measure the masses of red giants*, 2011, ASPC, 445, 165

17. **Neilson, H.R**.; Ngeow, C.-C.; Kanbur, S.M.; & Lester, J.B. *The connection between pulsation, mass loss and circumstellar shells in classical Cepheids*, 2009, AIPC, 1170, 141

18. Ngeow, C.-C.; Kanbur, S.M.; Ghobrial, L.; **Neilson, H.R.**; & Macri, L. *IRAC band period-luminosity relation from LMC Cepheids: application to three nearby galaxies*, 2009, AIPC, 1170, 37

19. **Neilson, H.R.**; & Lester, J.B. *Modeling stellar atmospheres with a spherically-symmetric version of the ATLAS code: testing the code by comparisons to interferometric observations and PHOENIX models*, 2009, AIPC, 1094, 804

20. **Neilson, H.R.**; Ngeow, C.-C.; Kanbur, S.M.; & Lester, J.B. *Modeling mass loss and infrared excess in Large Magellanic Cloud Cepheids*, 2008, ArXiv:0808.3995

Popular Articles

• **Neilson, H.R.** 2014 *Looking for the Christmas Star: A brilliant case of where religion and science are brought together in wonder,* Downhome Magazine, December 2014

Invited Talks

• *Exploring the frontiers of stellar astrophysics with classical Cepheids: rotation, convection, mass loss and multiplicity*, colloquium presented at Memorial University of Newfoundland, 21 January 2016

• *Stellar limb darkening: unsung hero or just another nuisance?*, colloquium presented at Georgia State University, 4 June 2015

• *Exploring the frontiers of stellar astrophysics with classical Cepheids: rotation, convection, mass loss and multiplicity*, colloquium presented at St. Mary's University, 4 December 2014

• *Mass loss, binarity and rotation: testing the details of stellar astrophysics using classical Cepheids*, colloquium presented at Western University, 20 November 2014

• *Pulsation and Mass Loss across the Hertzsprung-Russell Diagram: From OB stars to Cepheids to Red Supergiants* invited review talk presented at IAU Symposium 301: Precision Asteroseismology, Celebration of the Scientific Opus of Wojtek Dziembowski, Wrocław, Poland, 19-23 August 2013

• *A Better Understanding of Classical Cepheids: stellar evolution, mass loss and the infrared period-luminosity relation* colloquium presented at the University of Denver, Denver USA, February 2013 and at the University of Toledo, Toledo USA, September 2013

• *The Life & Times of the North Star: what evolution models are telling us about Polaris and other Cepheids* presented at the AAS meeting #220, Anchorage USA, June 2012

• *Pulsation, mass loss & circumstellar envelope*s presented at Cepheid Workshop, Paris France, December 2009

Contributed Talks

• *The Cepheid in the eclipsing binary system OGLE-LMC-CEP1812 is a stellar merger* presented at the 224th meeting of the AAS, Boston, USA, 1 - 5 June 2014

• *Cepheid period jitter is caused by convective cells* presented at the 223rd meeting of the AAS, Washington D.C. USA, 5 - 9 January 2014

• Organized splinter session *Asteroseismology & the Hubble Constant* at IAU Symposium 301: Precision Asteroseismology, Celebration of the Scientific Opus of Wojtek Dziembowski, Wrocław, Poland, 19-23 August 2013

• *Cepheid Binary Synthesis: just how many are there?* presented at the annual meeting of CASCA, Calgary, Canada, June 2012

• *Comparison of limb-darkening laws from plane-parallel and spherically-symmetric model stellar atmospheres* presented at IAU Symposium 282: From Interacting Binaries to Exoplanets: Essential Modeling Tools, Tatranská Lomnica, Slovakia, July 2011

• *Limb darkening and model atmospheres* presented at the annual meeting of CASCA, London Canada, May 2011

• *Resolving the Cepheid mass discrepancy with pulsation-driven mass loss* presented at the AAS meeting #218, Boston USA, May 2011

• *Weighing Betelgeuse: measuring mass of red supergiants from stellar limb darkening* presented at the 9th Pacific Rim Conference on Stellar Astrophysics, Lijiang China, April 2011

• *Stellar evolution with pulsation-driven mass loss: the case of LMC Cepheids* presented at the 9th Pacific Rim Conference on Stellar Astrophysics, Lijiang China, April 2011

• *Measuring the Mass of Betelgeuse* presented at the Annual Meeting of the Astronomishce Gesellscharft, Bonn Germany, September 2010

• *Limb darkening as a test of stellar atmospheres* presented at the Annual Meeting of CASCA, Halifax Canada, May 2010

• *The connection between pulsation, mass loss & circumstellar shells in classical Cepheids* presented at Stellar Pulsation: Challenges to Theory and Observation, Santa Fe USA, May 2009

• *Infrared excess and mass loss in LMC Cepheids* presented at the Annual Meeting of CASCA, Toronto Canada May 2009

• *Analytical Derivation of Pulsation-driven mass loss in Classical Cepheids* presented at the AAS meeting #211, Austin USA, January 2008

Non-Academic Interests / Experiences

• Member of Qalibu First Nations Band (Canadian First Nation status number 0340695901)

• Consulted for architectural design project for Forrec Inc. Toronto, Canada

• Interests in history of astronomy, first nations/aboriginal sky lore, literature and science fiction/fantasy

• Interviewed by Earth Magazine, Sciencas.nl (Dutch), WR2 Impuls (German) and ScienceNOW for my article *The period change of the Cepheid Polaris suggest enhanced mass loss*, 2012