

# CURRICULUM VITAE: *Dr Richard Ignace*

<i>Address:</i> Department of Physics & Astronomy College of Arts & Sciences EAST TENNESSEE STATE UNIVERSITY Johnson City, TN 37614	Office of Undergraduate Research Honors College EAST TENNESSEE STATE UNIVERSITY Johnson City, TN 37614
<i>Email:</i> ignace@etsu.edu	ignace@etsu.edu
<i>Web:</i> faculty.etsu.edu/ignace	www.etsu.edu/honors/ug_research
<i>Phone/Fax:</i> (423) 439-6904 / (423) 439-6905	(423) 439-6073 / (423) 439-6080

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## EDUCATION

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Ph.D. in Astronomy, *University of Wisconsin* 1996  
M.S. in Physics, *University of Wisconsin* 1994  
M.S. in Astronomy, *University of Wisconsin* 1993  
B.S. in Astronomy, *Indiana University* 1991

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## POSITIONS HELD

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Aug 2016–present, Consultant, *Tri-Alpha Energy*  
Jan 2015–present, Director of Undergraduate Research Activities, *East Tennessee State University*  
Aug 2013–present, Full Professor: *East Tennessee State University*  
Aug 2007–Jul 2013, Associate Professor: *East Tennessee State University*  
Aug 2003–Jul 2007, Assistant Professor: *East Tennessee State University*  
Sep 2002–Jul 2003, Assistant Scientist: *University of Wisconsin*  
Aug 1999–Aug 2002, Visiting Assistant Professor: *University of Iowa*  
Nov 1996–Aug 1999, Postdoctoral Research Assistant: *University of Glasgow*

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## SELECTED PROFESSIONAL ACTIVITIES

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### **Involved with service to discipline, institution, and community**

As Director of Undergraduate Research & Creative Activities, I administrate grant programs and activities that support undergraduate scholarship, plus advocate for undergraduate research.

Successful with publishing scholarly articles and competing for grant funding; author of the astronomy textbook “Astro4U: An Introduction to the Science of the Cosmos,” of the popular astronomy book “Understanding the Universe,” and co-editor of the conference proceedings “The Nature and Evolution of Disks around Hot Stars”

Principal organizer for STELLAR POLARIMETRY: FROM BIRTH TO DEATH, Jun 2011; and THE NATURE AND EVOLUTION OF DISKS AROUND HOT STARS, Jul 2004.

Co-organizer for EDUCATION, RESEARCH, AND ECONOMIC IMPACT: MAKING THE FUTURE BRIGHTER FOR NORTHEAST TENNESSEE, Mar 2013

Scientific Organizing Committee for RADIO STARS II, Nov 2017; THE PHYSICS AND MODELING OF POLARIZATION IN ASTROPHYSICS, May 2014

Member of the *American Astronomical Society*, the *International Astronomical Union*, the *Council on Undergraduate Research*, the *American Association for the Advancement of Science*, and the *Tennessee Academy of Science*

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## RESEARCH FUNDING AND OBSERVING TIME

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Funding awards in aggregate (nearest \$1000), as PI or co-I: \$4,879,000

(proposals under review are not listed)

71. 2017, NASA/XMM-Newton – “Tight Surveillance of the Exemplary O Star zeta Ophiuchi with XMM-Newton,” Oskinova (PI), Massa, Lobel, Prinja, Toala, Hamann, Waldron, **Ignace**, Bozzo, Shenar, Sander, (Pri. C time)
70. 2017, NASA/XMM-Newton – “X-ray Aurora of the Early Magnetic B-Type Star HR 7355,” Oskinova (PI), Leto, Trigilio, **Ignace**, funding TBD
69. 2017, NASA/Chandra – “Legacy HETG Spectrum of a Massive Star:  $\zeta$  Pup,” Waldron (PI), Nichols, Huenemoerder, Moffat, **Ignace**, Naze, Richardson, Oskinova, Hamann, Miller, Lauer, Dahmer, Gayley, Ramiamantsoa, Shenar, \$230,897
68. 2017, NASA/Chandra/Archival – “Classification of Massive Stars Based on their X-ray Spectra,” **Ignace (PI)**, Huenemoerder, Nichols, \$44,999
67. 2016, National Radio Astronomy Observatory/VLA – “Revealing the Structure of the Outer Disks of Classical Be Stars,” Klement (PI), Matthews, Rivinius, **Ignace**, Bjorkman; observing time awarded, no funding involved
66. 2016, NASA/Chandra – “Using the Sharp Chandra’s Eyes to Find a Neutron Star Lurking in the Wind of WR 124,” Oskinova (PI), **Ignace**, Toala, Torrejon, Hainich, Hamann, Chu, Guerrero, \$26,500
65. 2016, National Science Foundation – “Time Resolved Echelle Spectroscopy of Massive Stars at the SARA Observatory,” Petit (PI), Batcheldor, Henson, **Ignace**, \$417,399
64. 2016, NASA/Hubble Space Telescope– “The Wind Variability in Oscillating Massive Stars,” Oskinova (PI), Balona, Hamann, Hubrig, Huenemoerder, **Ignace**, Massa, Prinja, Todt, \$42,426
63. 2016, Gemini Observatory – “Gemini Planet Imager Classical Cepheid Survey,” Neilson (PI), et al (**Ignace** is a co-I), no funding available
62. 2015, National Radio Astronomy Observatory/VLA – “Early-type Stars Magnetospheres,” Leto (PI/Osservatorio Astrofisico di Catania), Oskinova, Trigilio, Umana, Buemi, Ingallinear, **Ignace**, Todt, Leone; observing time only, no funding available
61. 2015, NASA/Chandra – “Using Chandra to Explore New Physics of Magnetic A-Type Stars: KQ Vel and Its Mysterious Companion.” Hubrig (PI/Potsdam), Oskinova, **Ignace**, \$17,000
60. 2015, NASA/Chandra – “A Probe of the Hybrid Colliding Wind and Centrifugal-Magnetospheric X-ray Emission of Plaskett’s Star,” Leutenegger (PI/NASA-GSFC), Grunhut, Wade, Petit, Cohen, Owocki, Sundqvist, Naze, Mahy, **Ignace**, Moffat, Leyder, ud-Doula, \$150,000
59. 2015, NASA/Swift – “SWIFT Monitoring of Rotationally Modulated X-rays from the Keystone Massive Star and SN Progenitor, WR 110,” Oskinova (PI/Potsdam), **Ignace**, Massa; observing time only, no funding involved
58. 2015, NASA/Hubble Space Telescope – “The Wind of ksi Per: A Tomographic View of Stellar Wind Dynamics,” Massa (PI/Space Science Institute), Oskinova, Hamann, Huenemoerder, **Ignace**, Prinja, Lobel, \$12,825 (portion for Ignace)
57. 2014, National Radio Astronomy Observatory/VLA – “The definitive radio study of 3 representative magnetic massive stars,” Leto (PI/Osservatorio Astrofisico di Catania), Oskinova, Trigilio, Umana, Buemi, Ingallinear, **Ignace**, Todt; observing time only, no funding available
56. 2014, NASA/Chandra – “A Deep X-ray Look at a Very Massive Star: HETG Spectroscopy of the Blue Hypergiant HIP 101364,” Huenemoerder (PI/Mass. Inst. of Tech.), Oskinova, Hamann, **Ignace**, Schulz, Neilson, \$56,366
55. 2014, NASA/Chandra – “A Study of Colliding Winds in Short Period B Star Binaries,” **Ignace (PI)**, Hole, Oskinova, \$27,595

54. 2013, NASA/Suzaku – “Comparative Study of Magnetic O-Type Stars with Suzaku,” Oskinova, (PI/U. of Potsdam), Kitamoto, **Ignace**, Hubrig, Kueker, no funding available
53. 2013, NASA/XMM-Newton – “X-ray Characterization of The Unique Stellar Radio Pulsar CU Virginis,” Oskinova (PI/U. of Potsdam), et al, awarded priority “C” time
52. 2012, NASA/XMM-Newton – “What is Nunki?,” Oskinova (PI/U. of Potsdam), **Ignace**, Huenemoerder, no funding involved
51. 2012, NASA/Chandra – “Particle Acceleration in a Bow Shock around  $\zeta$  Oph,” Oskinova (PI/U. of Potsdam), Pohl, **Ignace**, \$24,497
50. 2012, NASA/Chandra (Large Program) – “Wolf-Rayet Winds at High Spectral Resolution,” Huenemoerder (PI/Chandra X-ray Center), Gayley, Hamann, **Ignace**, Nichols, Oskinova, Pollock, Schulz, \$126,217
49. 2012, NASA/Chandra (Large Program) – “X-ray Geometry of the Wind of the Giant O-Star  $\delta$  Orionis,” Corcoran (PI/NASA-Goddard), Pollock, Gull, Hamaguchi, Evans, Owocki, Moffat, Walborn, Maiz-Apellanix, Leutenegger, Russell, Waldron, Oskinova, **Ignace**, Nichols, Naze, et al., \$152,216
48. 2012, National Science Foundation/Astronomical Sci. – “REU Supplement for: Tracing the Spectropolarimetric History of Circumstellar Structures from High-Mass Stars through Supernovae,” **Ignace (PI)**, \$7,995
47. 2011, NASA/XMM-Newton – “X-ray Portrait of a Massive Star with a Magnetic Personality:  $\xi^1$  CMa,” Oskinova (PI/U. of Potsdam), Naze, **Ignace**, Hubrig; awarded observing time, no funding involved
46. 2011, Tennessee Space Grant – “Student Attraction and Retention in Physics and Astronomy (SARPA) Scholarships,” Smith (PI/ETSU), Giroux, Henson, **Ignace**, Luttermoser, \$10,000
45. 2011, European Southern Observatory/VLT – “Confirming the Presence of Magnetic Fields in the Most-Evolved Massive Stars,” Hamann (PI/U. of Potsdam), Hubrig, **Ignace**, Oskinova; observing time awarded, no funding involved
44. 2011, National Science Foundation/Astronomical Sci. – “A Workshop on Stellar Polarimetry: From Birth to Death,” **Ignace (PI)**, Hoffman, \$22,190
43. 2010, NASA/XMM-Newton – “X-ray Study of Tau-Sco-Like Massive Stars,” **Ignace (PI)**, Oskinova, Massa; observing time awarded, no funding involved
42. 2010, Tennessee Space Grant – “Student Attraction and Retention in Physics and Astronomy (SARPA) Scholarships,” Smith (PI/ETSU), Giroux, Henson, **Ignace**, Luttermoser, \$18,000
41. 2010, NASA/Astrophysical Data Program – “Why Evolved Massive Single Stars Create X-rays: Analysis of XMM Observations of WR 6 (EZ CMa),” Gayley (PI/U. of Iowa), **Ignace**, \$42,000
40. 2010, NASA/Chandra – “Understanding the Weak Winds: High-Resolution Chandra Spectroscopy of  $\mu$  Col,” Oskinova (PI/U. of Potsdam), Huenemoerder, Hamann, **Ignace**, Todt, Feldmeier, Krticka, Waldron, \$41,802
39. 2010, European Southern Observatory/VLT – “Search for Magnetic Fields in the Most-Evolved Massive Stars,” Hamann (PI/U. of Potsdam), Hubrig, **Ignace**, Oskinova; awarded observing time, no funding involved
38. 2010, European Southern Observatory/VLT – “Massive Stars as Cosmic Engines: A VLT-FLAMES survey of massive stars in the supergiant shell SGC SMC 1,” Oskinova (PI/U. of Potsdam), et al. (**Ignace** a listed co-I); awarded observing time, no funding involved
37. 2010, Canada-France-Hawaii Telescope – “The Magnetic Topology of Tau Sco Analogues,” Petit (PI/West Chester U.), **Ignace**, Kochukhov, Massa, Wade, awarded Priority-C time (dynamic scheduling); no funding involved
36. 2010, National Radio Astronomy Observatory/EVLA – “A Radio Study of Flaring Be Disks,” **Ignace (PI)**, Matthews, Bjorkman; awarded observing time, no funding involved
35. 2009, NASA/XMM-Newton – “X-rays at the Latest Stage of a Massive Star’s Life: A thorough study of the Wolf-Rayet star WR 6 with XMM-Newton,” Oskinova (PI/U. of Potsdam), **Ignace**, Hamann, Gayley, Feldmeier; awarded observing time, no funding involved

34. 2009, NASA/Chandra (Large Program) – “Cosmic Archaeology with Chandra: From a Supergiant Shell to Young Stellar Objects,” Oskinova (PI/U. of Potsdam), Chu, Gallagher, Guerrero-Roncel, Hamann, **Ignace**, Manuel, Naze, Silich, Townsley, Vink, \$63,825
33. 2009, National Science Foundation/Major Research Instrumentation – “Enhancing and Enlarging the Scientific Impact of the SARA Observatories,” **Ignace (PI)**, Hillwig, Oswald, and the SARA Consortium, \$382,144
32. 2009, National Science Foundation/Astronomical Sci. – “REU Supplement for: Tracing the Spectropolarimetric History of Circumstellar Structures from High-Mass Stars through Supernovae,” **Ignace (PI)**, \$9,270
31. 2008, NASA/XMM-Newton – “X-ray Archaeology of NGC 602: Are massive stars engines of cosmic evolution,” Oskinova (PI/U. of Potsdam), Chu, Guerrero-Roncel, Hamann, **Ignace**, Maddox, Manuel, Naze, Richter, Silich, Vink; awarded observing time, no funding involved
30. 2008, NASA/XMM-Newton – “Exploring Connections between Magnetism and X-ray Emission in Massive Stars,” **Ignace (PI)**, Oskinova, Brown, Cassinelli, Hamann, Waldron, \$65,151
29. 2008, National Science Foundation/Astronomical Sci. – “Galaxy Wars: Star Formation and Stellar Populations in Interacting Galaxies Conference,” Smith (PI/ETSU), Giroux, Henson, **Ignace**, Luttermoser, \$15,000
28. 2008, NASA/Astrophysical Theory Program – “A Study of Clumps and Bow Shock Structures in Hot Star Stellar Winds,” Waldron (PI/Eureka Scientific Inc.), Cassinelli, **Ignace**, Cho, \$365,703
27. 2008, National Science Foundation/Astronomical Sci. – “Collaborative Research: RUI: Tracing the Spectropolarimetric History of Circumstellar Structures from High-Mass Stars through Supernovae,” **Ignace (Co-PI)**, Hoffman (Co-PI/U. of Denver), Henson, \$997,702
26. 2008, CFHT – “Magnetism in Massive Stars (MiMeS),” a Large Programme, Wade (PI/Royal Mil. Coll. of Canada), **Ignace** a named collaborator
25. 2007, NASA/Suzaku – “X-rays from Magnetically Confined Hot Plasma in  $\tau$  Sco,” **Ignace (PI)**, Cassinelli, Cohen, Donati, Oskinova, Townsend, Jardine, Ud-Doula, \$20,929
24. 2007, NASA/XMM-Newton – “Wolf-Rayet 1: A Study of X-ray Production from a Structured and Massive Wind,” **Ignace (PI)**, Oskinova, Ishibashi, Feldmeier, Cassinelli, Brown, \$38,478
23. 2007, NASA/XMM-Newton – “The Fastest Stellar Winds as New Sources of Hard X-rays,” Oskinova (PI/U. of Potsdam), **Ignace**, Hamann, Chu, Feldmeier, \$30,200
22. 2007, NASA/Astrophysical Data Program – “A Study of the Variable Hard X-ray Emission from the Massive Interacting Binary Beta Lyrae,” Waldron (PI/Eureka Scientific Inc.), **Ignace**, Hoffman, \$108,915
21. 2007, AAS International Travel Grant – to attend the Manchester Microlensing Conference (Jan 2008), \$900
20. 2007, NASA/Chandra – “Can Different Elements Move with Different Velocities in a Radiatively Driven Stellar Wind?,” Oskinova (PI/U. of Potsdam), Feldmeier, Hamann, **Ignace**, Waldron, Guerrero, \$21,431
19. 2007, National Science Foundation/Astronomical Sci. – “A Workshop on The Biggest, Baddest, Coolest Stars,” Luttermoser (PI/ETSU), Giroux, Henson, **Ignace**, Smith, \$12,730
18. 2007, NASA/RXTE – “A Study of the Variable Hard X-ray Emission from the Massive Interacting Binary Beta Lyrae,” Waldron (PI/Eureka Scientific Inc.), Hamann, Hoffman, **Ignace**, Oskinova; observing time awarded, no funding involved
17. 2007, NASA/FUSE – “Non-Spherical Winds and Disks around Rapidly Rotating, Luminous Stars,” **Ignace (PI)**, Kraus, \$20,000
16. 2006, ESO/VLT – “The Hanle Effect as a Diagnostic of Magnetic Fields in High-Mass Stars,” Hubrig (PI/European Southern Obs.), **Ignace**, Schnerr, Chesneau; observing time awarded, no funding involved
15. 2006, National Science Foundation/REU Program (SARA Consortium) – “The Southeastern Association for Research in Astronomy REU Site Program,” Wood (PI/Florida Institute of Tech.), **Ignace** listed among Senior Personnel, \$478,180

14. 2006, ETSU/Research Development Committee Grants – “Development of a Radiative Transfer Code that Incorporates the Hanle Effect,” **Ignace (PI)**, \$2,950
13. 2006, NASA/Suzaku – “X-ray Study of Hot Plasma in the Interacting Binary Beta Lyrae,” **Ignace (PI)**, Hamann, Hoffman, Oskinova, Waldron, \$24,992
12. 2005, ETSU – Basler Fellowship, \$10,000
11. 2004, NASA/Spitzer – “Determining Wolf Rayet Wind Structure from IRS Spectra,” Cassinelli (PI/U. of Wisconsin), Lamers, Churchwell, **Ignace**, \$22,000
10. 2004, National Science Foundation/Astronomical Sci. – “A Workshop on The Nature and Evolution of Disks around Hot Stars,” **Ignace (PI)**, Bjorkman, Cassinelli, Gayley, \$16,420
9. 2004, Tennessee Space Grant Consortium – “Promoting Careers in Science: Connecting with Guidance Counselors,” **Ignace (PI)**, Henson, \$2,475
8. 2003, NASA/Chandra (Theory Program) – “The Clumpy Outflows of Hot Stars and Their X-ray Signatures,” Cassinelli (PI/U. of Wisconsin), Lazarian, Cho, **Ignace**, \$75,000
7. 2001, National Science Foundation/Astronomical Sci. – “Circumstellar Magnetic Field Diagnostics from the Polarization of Line Scattering,” Nordsieck (PI/U. of Wisconsin), Cassinelli, **Ignace**, Lazarian, \$394,000
6. 2000, VLBA – “Probing Shock Structure in the Wolf-Rayet Binaries WR146 and WR147,” Mutel (PI/U. of Iowa), **Ignace**, Gayley, no funding involved
5. 1999, National Science Foundation/Astronomical Sci. – “Probing Circumstellar Envelopes with Gravitational Microlensing”, **Ignace (PI)**, Bjorkman, \$196,000
4. 1999, NASA/XMM-Newton – “X-ray Emission from Single Wolf-Rayet Stars”, **Ignace (PI)**, Brown, Oskinova, \$32,600+\$2,200 augmentation
3. 1998, PPARC – “Reach for the Stars”, Hendry (PI/U. of Glasgow), Barrett, Conway, **Ignace**, awarded under Small Awards Scheme for Projects in Public Understanding of Science
2. 1994 and 1996, NASA/Infrared Space Observatory – “The Velocity Structure of Wolf-Rayet Winds from Infrared Line and Continuum Observations”, Cassinelli (PI/U. of Wisconsin), **Ignace** (while grad student)
1. 1994, NASA/Astrophysical Theory Program – “Multi-Wavelength Diagnostics of Rotation and Non-Spherical Winds in the Wolf-Rayet Stars,” Cassinelli (PI/U. of Wisconsin), Nordsieck, Wood, **Ignace** (while grad student)

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## PROFESSIONAL DEVELOPMENT

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NASA MissionSTEM Summit 2016 ([missionstem.nasa.gov](http://missionstem.nasa.gov)), 2016 Aug

SoCon “LEAD” Workshop ([www.citadel.edu/root/socon-lead-program](http://www.citadel.edu/root/socon-lead-program)), 2016 Jul

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## AWARDS/HONORS

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ETSU Distinguished Research Award for the College of Arts & Sciences (2015-16)

ETSU Distinguished Research Award for the College of Arts & Sciences (2008-09)

Marsico Short Term Visiting Scholar (University of Denver, 2008 Oct)

Selected as the 2005 ETSU Basler Fellow

UNDERSTANDING THE UNIVERSE selected as a Science - Grades 7-12 Honor Book, 2003 Book Awards - Society of School Librarians International (SSLI)

Member of Phi Beta Kappa (since 1990)

Graduated with honors from Indiana University

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## REFERENCES

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1. *Professor Jon E. Bjorkman*  
Director of the Ritter Observatory  
Physics and Astronomy  
University of Toledo  
Ritter Observatory 302  
Toledo, OH 43606  
419 530-8535  
jon.bjorkman@utoledo.edu
2. *Professor Martin A. Hendry*  
Head of School  
Physics & Astronomy  
Kelvin Building  
University of Glasgow  
Glasgow G12 8QQ  
Scotland  
UK 141 330 5685  
Martin.Hendry@glasgow.ac.uk
3. *Professor Donald G. Luttermoser*  
Chair of Department  
Physics and Astronomy  
East Tennessee State University  
Box 70652  
Johnson City, TN, 37663  
423 439-4231  
lutter@etsu.edu
4. *Professor Judith B. Slagle*  
Dean of Honors College  
East Tennessee State University  
131 Yoakley Hall  
Johnson City, TN 37614  
423 439-6076  
slagle@etsu.edu
5. *Professor Nicole St-Louis*  
Universite de Montreal  
Departement de Physique  
CP 6128, Succ Centre-Ville  
Montreal QC H3C 3J7  
Canada  
514 343 6932  
stlouis@astro.umontreal.ca

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## ADMINISTRATIVE EXPERIENCE

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As Director of the Office of Undergraduate Research & Creative Activities (hereafter, "Office") in the ETSU Honors College, I perform several administrative functions, as summarized in the following.

### Oversight of Grant Programs

Student-Faculty Collaborative Grants: issue a call for proposals in Fall and Spring semesters, supervise application review process, issue awards, manage project reports

Summer Fellowship Grants: issue a call for proposals for the summer, supervise application review process, issue awards, manage project reports

Travel Grants: provided on a rolling basis, review of grant requests, issue awards, manage reports

Research Discovery Program: allows federal work study and appalachian performance scholars in need of service hours to have research experiences

### Institutional Engagement

Boland Undergraduate Research Symposium: principal organizer for this annual meeting, formation of a student organizing committee, general management of the meeting and activities

Committee Involvement: serve on the ETSU Research Advisory Committee and the Appalachian Research Forum Committee, and engage with various other committees and meetings as needed (such as the Tennessee Board of Regents High Impact Practices Taxonomy Committee)

Undergraduate Conferences: attended and/or led a student group to Tennessee Posters-at-the-Capitol for Spr 2016, 2017; Tennessee Experiential Learning Symposium (TELS) for Aut 2015; National Collegiate Honors Council (NCHC) for Aut 2015; National Conference for Undergraduate Research (NCUR) for Spr 2016; SoCon Undergraduate Research Forum (SURF) for Aut 2016, 2017

### Oversight of Training Programs

Laboratory Safety Workshop: the Office offers a lab safety workshop in the fall and spring semesters

Oral Presentation Workshop: the Office offers a workshop to ETSU students on delivering a conference talk

### Notables

Formed an Advisory Board for the Office

Involved with establishing a student-led undergraduate research club

Involved with effort to start crowdfunding for research at ETSU, including undergraduate students

Partnered with the ETSU Sherrod Library to produce an online Faculty Mentor database and a Student Researcher database

Won a grant from the Charles Koch Foundation to increase funding for summer fellowships in undergraduate scholarship

Represented ETSU among organizers for the SoCon Undergraduate Research Forum (SURF), 2015-present

Produced a series of Submission Guidelines for grant programs and overhauled online content for Undergraduate Research

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## RESEARCH EXPERIENCE

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### Theoretical

Radiative Transfer: Spectral diagnostics, wind emission lines, spectropolarimetry, line profile inversion

Magnetic Fields: Line polarization diagnostics based on the Hanle and Zeeman effects

Microensing: As a probe of background sources through selective amplification

Dynamics: Studies of winds from rotating stars, wind bow shock formation

Exoplanets: substellar companions to white dwarf stars; the influence of red giant winds on planetary atmospheres

### Observational/Interpretational

X-ray Astronomy: Awarded observing time with Chandra, XMM-Newton, Swift, RXTE, and Suzaku to study massive stars

Ultraviolet Astronomy: Awarded time with FUSE to study massive stars; awarded HST time for xi Per and for beta Cep variables

Optical Astronomy: Use of CFHT, VLT, and SARA telescopes to study massive stars

Infrared Astronomy: Awarded time with Spitzer and ISO to study massive stars; participated with interpreting GLIMPSE data for the structure of the Milky Way

Radio Astronomy: Awarded EVLA time to study Be star disks; awarded VLA time to study the magnetosphere of HR 7355

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## TEACHING EXPERIENCE

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### Undergraduate Courses

#### East Tennessee State University

- *Astronomy I*: the solar system for non-science majors (includes lab)
- *Astronomy II*: stars and galaxies for non-science majors (includes lab)
- *Research Methods*: contributor for a data analysis lab experience for physics majors
- *General Physics I & II*: algebra/trig level course of physics (mechanics, thermo, E&M, optics)
- *General Physics I and II Labs*
- *Statics*: calculus-based engineering course
- *Astrophysics*: calculus-based course on stellar astronomy
- *Electricity & Magnetism*: vector-calculus E&M course intended for physics majors
- *Physics Seminar*: instructor also serves as seminar organizer for the department
- *Independent Study*: student-led investigation of a problem of interest, with faculty guidance
- *Senior Thesis*: faculty-directed research for majors

#### University of Iowa

- *Modern Astronomy*: survey of astronomy for non-science majors
- *Characteristics and Origins of the Solar System*: for non-science majors
- *General Astronomy*: survey of astronomy for science majors
- *College Physics*: algebra/trig level course on mechanics and thermodynamics

### Research Supervision and Mentoring

#### Undergraduate

- 1997, E Todd (Glasgow), Monte Carlo Radiative Transfer
- 1998, now Dr C Foullon (Glasgow), X-ray Properties of Wolf-Rayet Winds
- 1999, now Dr M Brookes (Glasgow), Metallicity Effects for Be Star Disks



- 2003, A Ogden-Nussbaum (Wisconsin), X-ray Spectral Modeling of Stellar Winds
- 2003, M Vils (Wisconsin), Microlensing of Large Stellar Sources
- 2005, A Brimeyer (Iowa State) – SARA/REU, Forbidden Lines from Axisymmetric Stellar Winds
- 2006, R Bessey (Berry) – SARA/REU, Forbidden Lines from Colliding Wind Binaries
- 2006, A Burke (Vassar) – SARA/REU, X-ray Line Profiles from Clump Bow Shocks
- 2007, C Bunker (Stony Brook) – SARA/REU, Microlensing of Dusty Envelopes
- 2007, J Carson (Western Kentucky) – SARA/REU, Circumstellar Polarization
- 2007, S Gray (ETSU),  $H\alpha$  Variability from  $\beta$  Lyrae
- 2008, R Pedigo (ETSU) – NASA/Chandra/EPO, Analysis of Spitzer Spectra of WR Stars
- 2008, C Price (ETSU) – SARA/REU, Forbidden Line Shapes from Colliding Winds
- 2009, H Fries (ETSU) – NSF, Be Star Target List for SARA
- 2009, M Goodman (ETSU) – REU Supp, Spectral Slopes from Axisymmetric Envelopes
- 2009, S Gray (ETSU) – NSF, Polarimetry from ETSU
- 2009, M Gorski (U of Iowa) – SARA/REU, X-ray Emission from  $\alpha$  Cru
- 2009, J Herrington (Clemson) – SARA/REU, Forbidden Lines in Supernovae
- 2009, A Hopkins (ETSU) – NASA/XMM, X-ray Emissions from OB Stars
- 2009, C Price (ETSU) – NASA/ATFP, X-rays from Clumped Hot Star Winds
- 2010, M McFall (Butler) – SARA/REU, X-rays from CIRs in WR Winds
- 2010, B Madsen-Larson (ETSU) – NSF, Emission Lines from Be Disks
- 2010, E Middlemas (ETSU) – TN Space Grant, SARA Be Star Hit List
- 2011, C Brown (ETSU) – NSF, The Hanle Effect in Stellar Photospheres
- 2012, A Adams (ETSU) – REU Supp, Polarization of Mira Stars
- 2012, N Pingel (U of Wisconsin) – SARA/REU, Faraday Rotation Studies
- 2014, J McNeil (ETSU) – Research Discovery Program, Exoplanet Light Curves (co-supervisor with H. Neilson)
- 2015, W Asbury (ETSU) – NSF, Polarization of  $\epsilon$  Aur (co-supervisor with G. Henson)
- 2015, H Dingus (ETSU) – NSF, Kepler Light Curves of Symbiotic Stars (co-supervisor with G. Henson)
- 2015, F Proulx-Girardeau (U of Montreal) – Polarimetric modeling of CIRs (lead supervisor N. St-Louis at Montreal)
- 2016, P Tremblay (U of Montreal) – Emission line modeling of CIRs (lead supervisor N. St-Louis at Montreal)
- 2016, A Morelock (ETSU) – Microlensing of Pulsating Stars
- 2016, N Woo (ETSU) – Inversion of Bubble Intensity Profiles for Emissivity
- 2017, M Magno (ETSU) – Modeling Emission Lines from Beta Lyrae
- 2018, M Magno (ETSU) – Modeling Emission Lines from Beta Lyrae
- 2018, Z Damrau (ETSU) – Modeling Variability in  $f/i$  Line Ratios for Massive Star Winds

#### Independent Study

- 2016, A. Morelock (ETSU) – Microlensing of Pulsating Stars
- 2018, D. Gilmer (ETSU) – Factors that Influence Success in Research Funding

#### Undergraduate Thesis

- 2012-13, A Adams (ETSU) – Exploring Mira-Type Stars with Spectropolarimetry
- 2015-16, H Dingus (ETSU) – A Flickering Analysis of CH Cygni Using Kepler Data
- 2017-18, M. Magno (ETSU) – Modeling  $\beta$  Lyrae's  $H\alpha$  Line Profile

#### Postdoctorate

- 2001 Sep - 2003 Jul, Dr H. M. Bryce, Microlensing of Extended Sources

- 2009 May - 2012 Jun, Dr K. T. Hole, Spectropolarimetry of Supernovae, currently faculty at Norwich University
- 2012 Oct - 2014 Aug, Dr H. Neilson, Spectropolarimetry of Massive Stars, currently faculty at University of Toronto

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## SERVICE ACTIVITIES

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### For Discipline

Elected member of the Organizing Committee for Commission B6: *Astronomical Photometry and Polarimetry*, International Astronomical Union, Aug 2015 - Aug 2018

Local organizing committee for GALAXY WARS: STELLAR POPULATION AND STAR FORMATION IN INTERACTING GALAXIES, Jul 2009; THE BIGGEST, BADDEST, COOLEST STARS, Jul 2007; and PROBING THE DISTANT UNIVERSE WITH GRAVITATIONAL WAVES, Nov 2005

Peer review referee for several journals in astrophysics, including the *Astrophysical Journal*, *Astrophysical Journal Letters*, *Astronomy & Astrophysics*, *Astronomical Journal*, *Monthly Notices of the Royal Astronomical Society*, *Nature Astronomy*, *Icarus*, *Astronomische Nachrichten*, *Journal of Quantitative Spectroscopy and Radiative Transfer*

Contributor to a science white paper for the Stars and Stellar Evolution Science Frontiers Panel of the Astro2010 Decadal Survey Committee ([www7.nationalacademies.org/bpa/Astro2010.html](http://www7.nationalacademies.org/bpa/Astro2010.html); [lanl.arxiv.org/abs/0902.4222](http://lanl.arxiv.org/abs/0902.4222))

Peer review for National Science Foundation in the Astronomical Sciences, including CAREER, PAARE, and REU

Peer reviewer for NASA, including Astrophysics Data Analysis, Astrophysical Theory, Chandra, and RXTE

Reviewer for the CFHT ground-based observing program

Member of the Editorial Board for the online undergraduate research publication *Journal of the Southeastern Association for Research in Astronomy* (JSARA), 2007-2013

Reviewer of astronomy and physics textbook chapters, e.g. *College Physics* (W. H. Freeman & Co.), *College Physics* (Wiley), *Visualizing Astronomy* (Wiley), *College Physics* (McGraw-Hill), *Explorations* (McGraw-Hill), *Investigating Astronomy* (W. H. Freeman & Co.), and a physics book by Etkina et al (Pearson)

Reviewer for the 2016 Clean Tech Competition

### For Institution

University Research Advisory Committee (spring 2015 - present)

Promotion and Tenure Appeals Committee (2017-2019)

SoCon Undergraduate Research Conference, Planning Committee (2015-17)

Tennessee Board of Regents – High Impact Practice Taxonomy Project (fall 2015)

Tenure & Promotion Committee for College of A&S (2013-15)

Served as a member of the ETSU 125 Task Force (fall 2012)

Reviewer for TBR Diversity Research Grants (spring 2010)

ETSU Junior Day (2010 Mar 24)

College of Arts & Sciences Standing Committee for Academic Misconduct (spring 2012)

College of Arts & Sciences Faculty Council (fall 2009 - spring 2011)

College of Arts & Sciences Awards Committee (fall 2009 - spring 2011)

Member of TBR Audit team for Physics & Astronomy at Austin Peay State University (2009)

Advisor for Pre-Engineering Program (2007-2013)

Selection committee for new Director of Sponsored Programs (2007)

ETSU High Performance Cluster Computer Advisory Committee (2006-07; 2010-2013)

Committee for Academic Misconduct (2006-07)

Established new courses *Statics* and *Dynamics* for the Pre-Engineering track (2005-06)

Basler Chair Selection Committee (2005-07)

Departmental seminar coordinator (2004-05; spring 2009)

Various presentations at ETSU Observatory Open Houses and Planetarium

Led the development of a Minor in Astronomy at ETSU (estab. fall 2010)

### For Community

Presentations for children and young adults:

- Presentation for the Astronomy Club of Asheville
- Wellmont Madison House, Kingsport, TN – assisted living care facility
- Mountain Missions School in Grundy, VA – Presentation to 6-12 assembly, senior physics, science in 8th, science in 6th
- “Science Night” for St. Dominics School in Kingsport
- Planetarium presentation to the Bristol YWCA “TechGYRL” group
- Presenter for the use of math in careers to 5th graders at Gray Elementary
- Presenter for the Scientist badge to Webelos Scout; presenter for Girl Scouts at the Powell Observatory; presenter for Boy Scouts at Sulfur Springs
- Inquiry experiments in science for classes at Daniel Boone High School
- *Encore After School Program*, Kingsport City Schools (Dec 09 – May 10): Jackson Elem, Kennedy Elem, Lincoln Elem, Roosevelt Elem, Sevier Middle, Robinson Middle
- Lamar Elementary School, approx. 300 fourth, fifth, and sixth graders
- Developed instructions for a “Sidewalk Solar System” for schools: children use sidewalk chalk to make a scale model of the solar system
- Astronomy presentations at Johnson City, Gray, and Jonesborough Public Libraries
- Astronomy presentations to 5th, 6th, and 7th graders at Gray Elementary, and Ridgeview Elementary (various years)
- Participation in “Career Day” at Gray Elementary; in Science Career Adventure
- 2017 Solar Eclipse – provided informative interviews for print and televised news; provided informative presentations at various area libraries
- Assisted with the Jonesborough 2017 Solar Eclipse Block Party – gave a series of short presentations overviewing eclipses at the Storytelling Center, then led the crowd through the event itself

Keynote speaker for Bays Mountain Astronomy Club

Science Fair Judge (Apr 2014, Apr 2009, Feb 2009, Apr 2008, Mar 2007, Apr 2005, Mar 2018)

Participated as an author of “The Night Sky” column with the Johnson City Press newspaper

Science Olympiad hosted by ETSU: astronomy competition (2004-18)

Discussed careers in science at a meeting of the PTO for Gray Elementary

Lecturer at adult evening classes and speaker at amateur astronomy societies (U of Glasgow)

Participant in educating children using a transportable Starlab planetarium (U of Glasgow)

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## PUBLICATIONS

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### Books

1. **Ignace**. *Astro4U: An Introduction to the Science of the Cosmos* (revised 2nd ed). 2017, astronomy textbook, Cognella Publishing (cognella.com)
2. **Ignace** and Gayley (eds). *The Nature and Evolution of Disks around Hot Stars*. 2005, proceedings of the workshop, ASP Conf. Ser. #337
3. Prinja and **Ignace**. *Understanding the Universe*. 2002, a popular astronomy book (London: Philips, philips-maps.co.uk) (US edition with Facts On File, factsonfile.com)

### Refereed Journals

(Students indicated by †)

1. **Ignace**. “Asymmetric Shapes of Radio Recombination Lines from Ionized Stellar Winds.” 2018, *Revista Mexicana de Astronomia y Astrofisica*, submitted
2. Massa, Oskinova, Prinja, **Ignace**. “The Connection between X-ray and Wind-Line Variability in  $\xi$  Per.” 2018, *Astrophysical Journal*, submitted

3. Toala, Oskinova, **Ignace**, Chu, Hainich, Hamann, Guerrero, Torrejon. "Absence of an Accreting Neutron Star in WR 124: Degenerate Cannibalism?" 2018, *Astrophysical Journal Letters*, submitted
4. Leto, Trigilio, Oskinova, **Ignace**, Buemi, Umana, Cavallaro, Ingallinera, Bufano, Phillips, Agliozzo, Cerrigone, Todt, Riggi. "The Polarization Mode of the HD142301 Auroral Radio Emission." 2018, *Monthly Notices of the Royal Astronomical Society Letters*, submitted
5. **Ignace**. "Quantifying Undergraduate Participation in Scholarly Activities." 2018, *Scholarship and Practice of Undergraduate Research*, submitted
6. **Ignace**, Gray<sup>†</sup>, Magno<sup>†</sup>, Henson, Massa. "A Study of H $\alpha$  Line Profile Variations in  $\beta$  Lyr." 2018, *Astronomical Journal*, 156, 97
7. Stevance, **Ignace**, Crowther, Maund, Davies, Rate. "Probing the Rotational Velocity of Galactic WO Stars with Spectropolarimetry." 2018, *Monthly Notices of the Royal Astronomical Society*, 479, 4535
8. Shrestha, Neilson, Hoffman, **Ignace**. "Polarization Simulations of Stellar Wind Bow Shocks. I. The Case of Electron Scattering." 2018, *Monthly Notices of the Royal Astronomical Society*, 477, 1365
9. Leto, Trigilio, Oskinova, **Ignace**, Buemi, Umana, Ingallinera, Todt, Leone, Phillips, Agliozzo, Cerrigone. "A Combined Multiwavelength VLA/ALMA/Chandra Study Unveils the Complex Magnetosphere of the B-type Star HR5907." 2018, *Monthly Notices of the Royal Astronomical Society*, 476, 562
10. St-Louis, Tremblay<sup>†</sup>, **Ignace**. "Polarization Lightcurve Modeling of Corotating Interaction Regions in the Wind of the Wolf-Rayet Star WR 6." 2018, *Monthly Notices of the Royal Astronomical Society*, 474, 1886
11. Ramaramanantsoa, Moffat, Harmon, Ignace, (+36 authors). "BRITE-Constellation High-Precision Time-Dependent Photometry of the Early-O-Type Supergiant  $\zeta$  Puppis Unveils the Photospheric Drivers of Its Small- and Large-Scale Wind Structures." 2018, *Monthly Notices of the Royal Astronomical Society*, 473, 5532
12. **Ignace**, Hole, Oskinova, Rotter. "An X-ray Study of Two B+B Binaries: AH Cep and CW Cep." 2017, *Astrophysical Journal*, 850, 82
13. Neilson, McNeil<sup>†</sup>, **Ignace**, Lester. "Limb Darkening and Planetary Transits: Testing center-to-limb intensity variations and limb-darkening directly from model stellar atmospheres." 2017, *Astrophysical Journal*, 845, 65
14. Oskinova, Huenemoerder, Hamann, Shenar, Sander, **Ignace**, Todt, Hainich. "On the Binary Nature of Massive Blue Hypergiants: High-resolution X-ray spectroscopy suggests that Cyg OB2 12 is a colliding wind." 2017, *Astrophysical Journal*, 841, 39
15. Klement, Carciofi, Rivinius, Matthews, **Ignace**, Cure, Bjorkman, Vieira, Mota, Faes, Bratcher, Stefl. "Revealing the Structure of the Outer Disks of Be Stars." 2017, *Astronomy & Astrophysics*, 601, 74
16. Toala, Oskinova, **Ignace**. "On the Absence of Non-Thermal X-ray Emission around Runaway O Stars." 2017, *Astronomy & Astrophysics*, 838, L19
17. Leto, Trigilio, Oskinova, **Ignace**, Buemi, Umana, Ingallinera, Todt, Leone. "The Detection of Variable Radio Emission from the Fast Rotating Magnetic Hot B-Star HR 7355 and Evidence for Its X-ray Aurora." 2017, *Monthly Notices of the Royal Astronomical Society*, 467, 2820
18. **Ignace**. "Modeling X-ray Emission Lines from Massive Star Winds" (review article). 2016, *Advances in Space Research*, 58, 694
19. Toala, Oskinova, Gonzalez-Galan, Guerrero, **Ignace**, Pohl. "X-ray Observations of Bow Shocks around Runaway O Stars. The case of  $\zeta$  Oph and BD+43 $^{\circ}$ 3654." 2016, *Astrophysical Journal*, 821, 79
20. Hubrig, Scholz, Hamann, Scholler, **Ignace**, Ilyin, Gayley, Oskinova. "Searching for a Magnetic Field in Wolf-Rayet Stars Using FORS 2 Spectropolarimetry." 2016, *Monthly Notices of the Astronomical Society*, 458, 3381

21. **Ignace**. “Long-Wavelength, Free-Free Spectral Energy Distributions from Porous Stellar Winds.” 2016, Monthly Notices of the Royal Astronomical Society, 457, 4123
22. Wade, et al. “The MiMeS Survey of Magnetism in Massive Stars: Introduction and overview.” 2016, Monthly Notices of the Royal Astronomical Society, 456, 2
23. Huenemoerder, Gayley, Hamann, **Ignace**, Nichols, Oskinova, Pollock, Schulz, Shenar. “ Probing Wolf-Rayet Winds: Chandra/HETG X-Ray Spectra of WR 6.” 2015, Astrophysical Journal, 815, 29
24. Neilson, **Ignace**. “Period change and stellar evolution of  $\beta$  Cephei stars.” 2015, Astronomy & Astrophysics, 584, 58
25. Neilson, Izzard, Langer, **Ignace**. “The Strange Evolution of the Large Magellanic Cloud Cepheid OGLE-LMC-CEP1812.” 2015, Astronomy & Astrophysics Letters, 809, L1
26. Corcoran, et al. (+24 authors). “A Coordinated X-ray and Optical Campaign of the Nearest Massive Eclipsing Binary,  $\delta$  Ori Aa: I. Overview of the X-ray Spectrum.” 2015, Astrophysical Journal, 809, 132
27. Nichols, et al. (+20 authors). “A Coordinated X-ray and Optical Campaign of the Nearby Massive Binary  $\delta$  Orionis Aa: II. X-ray Variability.” 2015, Astrophysical Journal, 809, 133
28. Pablo, et al. (+46 authors). “A Coordinated X-ray and Optical Campaign of the Nearest Massive Eclipsing Binary,  $\delta$  Ori Aa: III.” 2015, Astrophysical Journal, 809, 134
29. Oskinova, Todt, Huenemoerder, Hubrig, **Ignace**, Hamann, Balona. “On X-ray Pulsations in  $\beta$  Cephei-Type Variables.” 2015, Astronomy & Astrophysics, 577, A32
30. **Ignace**, St-Louis, Proulx-Giraldeau<sup>†</sup>. “Polarimetric Modelling of Co-Rotating Interaction Regions (CIRs) Threading Massive-Star Winds.” 2015, Astronomy & Astrophysics, 575, 129
31. Hubrig, Scholler, Kholtygin, Tsumura, Hoshino, Kitamoto, Oskinova, **Ignace**, Todt, Ilyin. “New Multiwavelength Observations of the Of?p Star CPD  $-27^\circ$  2561.” 2015, Monthly Notices of the Royal Astronomical Society, 447, 1885
32. Neilson, **Ignace**, Smith, Henson, Adams<sup>†</sup>. “Evidence of a Mira-Like Tail and Bow Shock about the Semi-Regular Variable V CVn from Four Decades of Polarization Measurements.” 2014, Astronomy & Astrophysics, 568, 88
33. Oskinova, Naze, **Ignace**, Huenemoerder, Todt, Hubrig, Hamann. “Discovery of X-ray Pulsations from a Massive Star.” 2014, Nature Comm., 5, 4024
34. Neilson, **Ignace**. “Convection, Granulation, and Period Jitter in Classical Cepheids.” 2014, Astronomy & Astrophysics Letters, 563, L4
35. **Ignace**, Gayley, Hamann, Huenemoerder, Oskinova, Pollock, McFall<sup>†</sup>. “The XMM-Newton EPIC X-ray Light Curve Analysis of WR 6.” 2013, Astrophysical Journal, 775, 29
36. **Ignace**, Pingel<sup>†</sup>. “Faraday Rotation Distributions from Stellar Magnetism in Wind-Blown Bubbles.” 2013, Astrophysical Journal, 765, 19
37. **Ignace**, Oskinova, Massa. “A Report on the X-ray Properties of the  $\tau$  Sco Class of Stars.” 2013, Monthly Notices of the Royal Astronomical Society, 429, 516
38. Grunhut, et al. (+15 authors). “Detection of a Magnetic Field in the Rapidly-Rotating O-Type Secondary of the Colliding-Wind Binary HD 47129 (Plaskett’s Star).” 2012, Monthly Notices of the Royal Astronomical Society, 428, 1686
39. Grunhut, et al. (+14 authors). “Investigating the Spectroscopic, Magnetic and Circumstellar Variability of the O9 Subgiant Star HD 57682.” 2012, Monthly Notices of the Royal Astronomical Society, 426, 2208
40. Huenemoerder, Oskinova, **Ignace**, Waldron, Todt, Hamaguchi, Kitamoto. “On the Weak-Wind Problem in Massive Stars: Chandra Observations Reveal a Massive Hot Wind in  $\mu$  Colombae.” 2012, Astrophysical Journal Letters, 756, L34
41. **Ignace**, Waldron, Cassinelli, Burke<sup>†</sup>. “X-ray Emission Line Profiles from Wind Clump Bow Shocks in Massive Stars.” 2012, Astrophysical Journal, 750, 40
42. Hole, **Ignace**. “Variability in X-ray Line Ratios in Helium-like Ions of Hot Stars.” 2012, Astronomy

& Astrophysics, 542, A71

43. Oskinova, Gayley, Hamann, Huenemoerder, **Ignace**, Pollock. "High-Resolution X-ray Spectroscopy reveals the Special Nature of the Wolf-Rayet Star Winds." 2012, *Astrophysical Journal*, 747, L25
44. Oskinova, Todt, **Ignace**, Brown, Cassinelli, Hamann. "Early Magnetic B-type Stars: X-ray Emission and Wind Properties." 2011, *Monthly Notices of the Astronomical Society*, 416, 1456
45. **Ignace**, Hole, Cassinelli, Henson. "Time-Dependent Behavior of Linear Polarization in Unresolved Photospheres, with Applications for the Hanle Effect." 2011, *Astronomy & Astrophysics*, 530, 82
46. Petit, Massa, Macrolino, Wade, **Ignace**. "Discovery of the first  $\tau$  Sco Analogues: HD 66665 and HD 63425." 2011, *Monthly Notices of the Royal Astronomical Society*, 412, L45
47. **Ignace**. "The Hanle Effect as a Diagnostic of Magnetic Fields in Stellar Envelopes. V. Thin Lines from Keplerian Disks." 2010, *Astrophysical Journal*, 725, 1040
48. **Ignace**, Oskinova, Jardine, Cassinelli, Cohen, Donati, Townsend, Ud-Doula. "A Multi-Phase Suzaku Study of  $\tau$  Sco." 2010, *Astrophysical Journal*, 721, 1412
49. Oskinova, Gruendl, Chu, **Ignace**, Hamann, Feldmeier. "Hard X-ray Emission from the Massive Star-Forming Region ON 2." 2010, *Astrophysical Journal*, 712, 763
50. **Ignace**, Giroux, Luttermoser. "Radio Emission from Substellar Companions of Evolved Cool Stars." 2010, *Monthly Notices of the Royal Astronomical Society*, 402, 2609
51. Gayley, **Ignace**. "The Zeeman Effect in the Sobolev Approximation II. Radial Split Monopole Fields and the 'Heartbeat' Stokes V Profile." 2010, *Astrophysical Journal*, 708, 615
52. **Ignace**. "Recombination Lines and Free-Free Continua in Asymptotic Ionized Winds: Analytic solution for the radiative transfer." 2009, *Astronomische Nachrichten*, 330, 717
53. Li, Cassinelli, Brown, **Ignace**. "Polarization Variability Arising from Clumps in the Winds of Wolf-Rayet Stars." 2009, *Research in Astronomy and Astrophysics*, 9, 558
54. **Ignace**, Bessey<sup>†</sup>, Price<sup>†</sup>. "Modeling Forbidden Line Emission Profiles from Colliding Wind Binaries." 2009, *Monthly Notices of the RAS*, 395, 962
55. **Ignace**, Al-Malki, Simmons, Brown, Clarke, Carson<sup>†</sup>. "Scattering Polarization due to Light Source Anisotropy II. Envelope of Arbitrary Shape." 2009, *Astronomy & Astrophysics*, 496, 503
56. Oskinova, Hamann, **Ignace**, Chu, Feldmeier. "Discovery of X-ray Emission from the Wolf-Rayet Star WR 142 of Oxygen Subtype." 2009, *Astrophysical Journal Letters*, 693, L44
57. **Ignace**, Hubrig, Scholler. "Spectropolarimetric Variability and Co-Rotating Structure in HD 92207." 2008, *Astronomical Journal*, 137, 3339
58. Hubrig, Scholler, Schnerr, Gonzalez, **Ignace**, Henrichs. "Magnetic Field Measurements of O Stars with FORS 1 at the VLT." 2008, *Astronomy & Astrophysics*, 490, 793
59. Cassinelli, **Ignace**, Waldron, Cho, Murphy, Lazarian. "The Effects of Clumps in Explaining X-ray Emission Lines from Hot Stars." 2008, *Astrophysical Journal*, 683, 1052
60. **Ignace**, Oskinova, Waldron, Hoffman, Hamann. "Phase-Dependent X-ray Observations of the  $\beta$  Lyrae System: No eclipse in the soft band." 2008, *Astronomy & Astrophysics*, 477, L37
61. **Ignace**, Cassinelli, Tracy, Churchwell, Lamers. "Neon Abundances from a *Spitzer*/IRS Survey of Wolf-Rayet Stars." 2007, *Astrophysical Journal*, 669, 600
62. **Ignace**, Brimeyer<sup>†</sup>. "Models of Forbidden Line Emission Profiles from Axisymmetric Stellar Winds." 2006, *Monthly Notices of the RAS*, 371, 343
63. Hendry, **Ignace**, Bryce. "Microlensing of Circumstellar Envelopes III. Line Profiles from Stellar Winds in Homologous Expansion." 2006, *Astronomy & Astrophysics*, 450, 1023
64. **Ignace**, Bjorkman, Bryce. "Variable Polarization from Spherical Circumstellar Envelopes during Caustic Crossing Events." 2006, *Monthly Notices of the RAS*, 366, 92
65. Benjamin, et al. (+21 authors). "First GLIMPSE Results on the Stellar Structure of the Galaxy." 2005, *Astrophysical Journal Letters*, 630, L149
66. Brown, Cassinelli, Li, Kholtygin, **Ignace**. "Optically Thick Clumps – Not the Solution to the Wolf-Rayet Wind Momentum Problem?" 2004, *Astronomy & Astrophysics*, 426, 323
67. **Ignace**, Churchwell. "Free-Free Spectral Energy Distributions of Hierarchically Clumped HII Re-

- gions." 2004, *Astrophysical Journal*, 610, 351
68. **Ignace**, Nordsieck, Cassinelli. "The Hanle Effect as a Diagnostic of Magnetic Fields in Stellar Envelopes IV. Application to Polarized P Cygni Wind Lines." 2004, *Astrophysical Journal*, 609, 1018
  69. **Ignace**, Quigley, Cassinelli. "Constraints from Infrared Space Observatory Data on the Velocity Law and Clumpiness of WR 136." 2003, *Astrophysical Journal*, 596, 538
  70. **Ignace**, Oskinova, Brown. "XMM-Newton Observations of the Nitrogen-Rich Wolf-Rayet Star WR 1." 2003, *Astronomy & Astrophysics*, 408, 353
  71. **Ignace**, Gayley. "The Zeeman Effect in the Sobolev Approximation: Applications to Spherical Stellar Winds." 2003, *Monthly Notices of the RAS*, 341, 179
  72. Oskinova, **Ignace**, Hamann, Pollock, Brown. "The Conspicuous Absence of X-ray Emission from Carbon-Enriched Wolf-Rayet Stars." 2003, *Astronomy & Astrophysics*, 402, 755
  73. Bryce, **Ignace**, Hendry. "Microlensing of Circumstellar Envelopes II. Emission Lines from Radial and Azimuthal Flow during Fold Caustic Crossings." 2003, *Astronomy & Astrophysics*, 401, 339
  74. Simmons, Bjorkman, **Ignace**, Coleman. "Polarimetric Light Curves from Microlensing of Spherical Circumstellar Envelopes." 2002, *Monthly Notices of the RAS*, 336, 501
  75. **Ignace**, Gayley. "Profile Shapes for Optically Thick X-ray Emission Lines from Stellar Winds." 2002, *Astrophysical Journal*, 568, 954
  76. **Ignace**. "SED Signatures of Jovian Planets Around White Dwarf Stars." 2001, *Publications of the Astronomical Society of the Pacific*, 113, 1227
  77. Gayley, **Ignace**, Owocki. "Line Forces in Keplerian Disks Around Hot Stars." 2001, *Astrophysical Journal*, 558, 802
  78. **Ignace**, Cassinelli, Quigley, Babler. "Terminal Speeds and Ion Fractions from [CaIV] 3.207  $\mu\text{m}$  in Three Single WN Stars." 2001, *Astrophysical Journal*, 558, 771
  79. Oskinova, **Ignace**, Brown, Cassinelli. "Modelling X-ray Variability in the Structured Atmospheres of Hot Stars." 2001, *Astronomy & Astrophysics*, 373, 1009
  80. **Ignace**. "Theoretical Profile Shapes for Optically Thin X-ray Emission Lines from Spherical Stellar Winds." 2001, *Astrophysical Journal Letters*, 549, L125
  81. **Ignace**. "The Hanle Effect as a Diagnostic of Magnetic Fields in Stellar Envelopes III. The Case of a Finite Star." 2001, *Astrophysical Journal*, 547, 393
  82. **Ignace**. "Resonance Line Scattering Polarization in Optically Thin Planar Equatorial Disks." 2000, *Astronomy and Astrophysics*, 363, 1106
  83. **Ignace**, Oskinova, Foullon<sup>†</sup>. "Exospheric Models for the X-ray Emission from Single Wolf-Rayet Stars." 2000, *Monthly Notices of the Royal Astronomical Society*, 318, 214
  84. **Ignace**, Hendry. "Analytic Inversion of Emission Lines of Arbitrary Optical Depth for the Structure of Supernova Ejecta." 2000, *Astrophysical Journal Letters*, 537, L131
  85. Li, Brown, **Ignace**, Cassinelli, Oskinova. "Wolf-Rayet Wind Fine Structure and Optical Variability." 2000, *Astronomy & Astrophysics*, 357, 233
  86. Brown, **Ignace**, Cassinelli. "Hot Star Polarimetric Variability and the Nature of Wind Inhomogeneities." 2000, *Astronomy & Astrophysics*, 356, 619
  87. **Ignace**, Oskinova. "An Explanation of Observed Trends in the X-ray Emission from Single Wolf-Rayet Stars." 1999, *Astronomy & Astrophysics Letters*, 348, L45
  88. Al-Malki, Simmons, **Ignace**, Brown, Clarke. "Scattering Polarization due to Light Source Anisotropy I. Large Spherical Envelope." 1999, *Astronomy & Astrophysics*, 347, 919
  89. **Ignace**, Hendry. "Microlensing of Circumstellar Envelopes I. Simplified Considerations for Diagnosing Radial and Azimuthal Flow." 1999, *Astronomy & Astrophysics*, 341, 201
  90. **Ignace**, Cassinelli, Nordsieck. "The Hanle Effect as a Diagnostic of Magnetic Fields in Stellar Envelopes II. Some Theoretical Results for Resolved Line Profiles." 1999, *Astrophysical Journal*, 520, 335
  91. **Ignace**. "Emission Line Profile Shapes from Anisotropic Scattering in Planar Equatorial Disks."

- 1998, *Astronomy & Astrophysics*, 337, 819
92. **Ignace**, Brown, Milne, Cassinelli. "Inference of Steady Stellar Wind  $v(r)$  Laws from Optically Thin Emission Lines III. Inversion of total line intensity distributions." 1998, *Astronomy & Astrophysics*, 337, 223
  93. **Ignace**, Cassinelli, Bjorkman. "WCFields: Magnetic Rotating Stellar Wind Models from Wind Compression Theory." 1998, *Astrophysical Journal*, 505, 910
  94. **Ignace**. "A Re-evaluation of Profile Shapes from Resonance Line Scattering in Spherical Stellar Winds." 1998, *Astronomy and Astrophysics*, 332, 686
  95. **Ignace**, Brown, Richardson, Cassinelli. "Inference of Steady Stellar Wind  $v(r)$  Laws from Optically Thin Emission Lines II. Occultation effects and the determination of intrinsic stellar properties." 1998, *Astronomy & Astrophysics*, 330, 253
  96. Brown, Richardson, Cassinelli, **Ignace**. "Inference of Steady Stellar Wind  $v(r)$  Laws from Optically Thin Emission Lines I. Idealised analysis for the profile of a single line" 1997, *Astronomy & Astrophysics*, 325, 677
  97. **Ignace**, Nordsieck, Cassinelli. "The Hanle Effect as a Diagnostic of Magnetic Fields in Stellar Envelopes I. Theoretical Results for Integrated Line Profiles." 1997, *Astrophysical Journal*, 486, 550
  98. **Ignace**, Cassinelli, Bjorkman. "Equatorial Wind-Compression Effects Across the H-R Diagram." 1996, *Astrophysical Journal*, 459, 671
  99. Bjorkman, **Ignace**, Cassinelli, Tripp. "Evidence for a Disk in the Wind of HD 93521: UV Line Profiles from an Axisymmetric Model." 1994, *Astrophysical Journal*, 435, 416

### Conferences

(Invited or Contributed Talks; students indicated by †)

1. Shrestha, Hoffman, **Ignace**, Neilson. "Astronomy in Denver: Polarization of bow shock nebulae around massive stars." 2018, Jun AAS meeting, #232, oral 117.02
2. Oskinova, **Ignace**, Huenemoerder. "X-ray Diagnostics of Massive Star Winds." 2017, in *The Lives and Death-Throes of Massive Stars*, IAU Symp. #329, (ed) J. J. Eldredge, 151-155
3. Klement, Carciofi, Rivinius, Matthews, **Ignace**, Bjorkman, Vieira, Mota, Faes, Stefl. "The outer disk of the classical Be star  $\psi$  Per." 2017, in *The Lives and Death-Throes of Massive Stars*, IAU Symp. #329, (ed) J. J. Eldredge, 414
4. **Ignace**, St-Louis, Tremblay†, Proulx-Girardeau†. "Variable Polarization from Co-Rotating Interaction Regions in Massive Star Winds." 2017, Jan AAS meeting, #229, oral 232.07
5. **Ignace**, Henson, Asbury†. "Modeling the Variable Polarization of Epsilon Aurigae." 2016, Jun AAS meeting #228, oral 208.04
6. Huenemoerder, Oskinova, **Ignace**, Hamann, Schulz, Neilson, Shenar. "A Deep X-ray look at a very massive star: HETGS spectroscopy of the blue hypergiant Cyg OB2-12 (HIP 101364)." 2016, American Astronomical Society, HEAD meeting #15, 117.02
7. Huenemoerder, Gayley, Hamann, **Ignace**, Nichols, Oskinova, Pollock, Schulz. "High Resolution X-ray Spectra of WR 6." 2015, in *Wolf-Rayet Stars*, (eds) W.-R. Hamann, A. Sander, H. Todt, (Universitätsverlag Potsdam)
8. **Ignace**. "Radio Emission from Macroclumps in Massive Star Winds." 2014, Jun AAS meeting #224, oral 404.06
9. Neilson, **Ignace**. "Cepheid in the Eclipsing Binary System OGLE-LMC-CEP1812 is a Stellar Merger." 2014, Jun AAS meeting #224, 314.03
10. **Ignace** (invited). "Continuum Polarization in Circumstellar Media." 2014, oral presentation given at Theory and Modelling of Polarisation in Astrophysics (see [www.asu.cas.cz/~wg2prague](http://www.asu.cas.cz/~wg2prague))
11. **Ignace** (invited). "Faraday Rotation Effects for Diagnosing Magnetism in Bubble Environments." 2014, in *Wind Bubbles, Astrospheres and the Heliosphere: Environments and Cosmic Rays*, (eds) D. Bomans, H. Fichtner, K. Scherer, J. Tjus, K. Weis, *ASTRA Proc.*, vol. 1, (Copernicus Pub.), 1
12. **Ignace**, Waldron, Cassinelli. "X-ray Emissions from Clump Bowshocks in Massive Star Winds." 2012, Jan AAS meeting #219, oral 224.01



13. Huenemoerder, Oskinova, Hamann, **Ignace**, Todt, Waldron. "X-Ray Line Emission from Weak Wind O-Stars." 2011, American Astronomical Society, HEAD meeting #12, #10.02
14. Oskinova, Todt, **Ignace**, Brown, Cassinelli, Hamann. "Early Magnetic B-Type Stars: X-ray Emission and Wind Properties." 2011, to appear in The X-ray Universe
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### Miscellany of Note

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1. Pingel†, **Ignace**. "Investigating the Faraday Rotation Morphologies of Circumstellar and Interstellar Bubbles." 2012, JSARA, 7, 23
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5. Gorski†, **Ignace**. "An X-ray Analysis of  $\alpha$  Cru." 2010, JSARA, 4, 12
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### Poster Presentations

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1. Magno<sup>†</sup>, **Ignace**. "A Study of the H-alpha Emission in Beta Lyrae." 2018, Jan AAS meeting #231, 244.02
2. Gupta, Nordsieck, **Ignace**, Kinley, Nations, and the TAE Team. "Measurement of Magnetic Null and Field Reversal in FRC Plasmas using Hanle Effect Diagnostic." 2017, Oct, 59th Annual Meeting of the APS Division of Plasma Physics, in Milwaukee, WI
3. Morelock<sup>†</sup>, **Ignace**. "Finite Source Effects in the Microlensing of Radial Pulsating Stars." 2017, Apr, Appalachian Student Research Forum
4. Morelock<sup>†</sup>, **Ignace**. "Finite Source Effects in the Microlensing of Radial Pulsating Stars." 2017, Jan, Conferences for Undergraduate Women in Physics at Virginia Tech
5. Shrestha<sup>†</sup>, Hoffman, Nielson, **Ignace**. "Polarization signatures of bow shocks: A diagnostic tool to constrain the properties of stellar winds and ISM." 2017, Jan AAS meeting, #229, 151.11
6. Rotter<sup>†</sup>, Hole, **Ignace**, Oskinova. "Exploring X-ray Emission from Winds in Two Early B-type Binary Systems." 2017, Jan AAS meeting, #229, 151.12
7. Bratcher<sup>†</sup>, Bjorkman, **Ignace**, Matthews. "Searching for Disk Truncation in the Be Star Gamma Cassiopeiae." 2016, Jan AAS #227, #343.04
8. **Ignace**, Toala, Oskinova. "Inversion of Intensity Profiles for Bubble Emissivity." 2015, in Wolf-Rayet Stars, (eds) W.-R. Hamann, A. Sander, H. Todt, (Universitätsverlag Potsdam)
9. Neilson, **Ignace**, Henson. "Long-term polarization observations of Mira variable stars suggest asymmetric structures." 2014, in Precision Asteroseismology, (eds) W. Chaplin, J. Guzik, G. Handler, A. Pigulski, IAU Symp. #301, 463
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11. Nichols, et al. "Time-Resolved X-ray Spectroscopy of the Massive Binary delta Ori." 2014, Jan AAS #223, #151.07
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13. Shrestha<sup>†</sup>, Hoffman, Neilson, **Ignace**. "Polarization of Circumstellar Bow Shocks due to Electron Scattering." 2014, Jan AAS #223, #154.24
14. McNeil<sup>†</sup>, Neilson, **Ignace**. "Direct Modeling of Transiting Planet Light Curves from Model Stellar Atmospheres." 2014, Jan AAS #223, #347.03
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29. Gorski<sup>†</sup>, **Ignace**, Oskinova. "An X-ray Study of  $\alpha$  Cru." 2010, a poster given at the January AAS meeting #215, poster #430.05
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