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Curriculum Vitae
Dr. Ricky Egeland

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Education

Ph.D. Physics	Montana State University, Bozeman, MT	2017
M.Sc. Physics	Montana State University, Bozeman, MT	2013
B.Sc. Physics	University of Minnesota, Minneapolis, MN	2003

Dissertation: "Long-term Variability of the Sun in the Context of Solar-Analog Stars" (Apr 2017)
Ph.D. committee chair: Dana W. Longcope; thesis advisors: Petrus C. H. Martens & Phillip G. Judge.

Appointments

2019–now	Project Scientist at the High Altitude Observatory/NCAR, Boulder, CO *Hinode SOT/SP operations & data analysis; DKIST level-2 pipeline.*
2017–2019	Advanced Study Program Posdoctoral Fellow NCAR High Altitude Observatory, Boulder, CO *Postdoctoral Researcher on magnetic activity of the Sun and Sun-like stars.*
2014–2017	Newkirk Graduate Research Fellow NCAR High Altitude Observatory, Boulder, CO *Graduate Researcher on the long-term magnetic variability of Sun-like stars.*
2011–2013	Graduate Teaching Assistant at Montana State University, Bozeman, MT *Lab instructor, grader, and tutor for introductory physics courses.*
2011	Database Analyst at the Observatório Nacional, Rio de Janeiro, Brazil *Development of cluster-based analysis framework for the Dark Energy Survey.*
2006–2010	Information Technology Professional University of Minnesota LHC CMS Group, CERN, Geneva, Switzerland *Lead Developer of the PhEDEx petabyte-scale global data transfer manager.*
2002–2006	Information Technology Professional University of Minnesota LHC CMS Group, Minneapolis, MN *Database design for CMS experiment real-time detector calibrations.*
1999–2002	Software Developer University of Minnesota Physics Department, Minneapolis, MN *Educational software; online quizzes and physics simulations.*
1999	Undergraduate Research Opportunity (UROP) University of North Dakota, Grand Forks, ND *Correlation between SOUDAN II muon events and EGRET gamma-ray bursts.*
1998–1999	Student Researcher and Software Developer University of Minnesota, Crookston, MN *Classification of SOUDAN II muon events; web development and online quizzes.*

Additional Training

- ASP colloquium "Solar Spectropolarimetry and Diagnostic Techniques." Instructors: B. Lites, J.C. del Toro Iniesta, R. Casini, H. Uitenbroek, et al. Estes Park, CO, Sep 24–Oct 8, 2018
- Grant Development Workshop, instructor: M. Harris. NCAR, Boulder, CO, Jul 12–13, 2018
- Completed two graduate-level courses in computer science at Montana State University, CSCI 550 *Data Mining* and CSCI 548 *Reasoning with Uncertainty* (Markov-Chain Monte Carlo & Bayesian Networks). Received A grade in both courses.

Observing

- "HOP 393: Cycle 24/25 equatorial transition"; PI, *Hinode* spacecraft (Dec 2020–Dec 2021)
- "The Evolution and Variability of Sun-like Activity Cycles"; Co-I with PI S. Mathur, Las Cumbres Observatory NRES spectrograph "Key Project" (2020B–2023A)
- "Radii of Solar Analogues with Known Magnetic Variability"; PI, Mount Wilson Observatory CHARA interferometer (2018A–2019B)
- "Star Spots and Radii of Solar Analogues"; PI, Mount Wilson Observatory CHARA interferometer (2016B, 2017B)
- "Activity Cycles in Asteroseismic Solar Analogs"; Co-PI with PI T. Metcalfe, Las Cumbres Observatory NRES spectrograph (2017B–2020A)
- "Activity Cycles in Kepler Asteroseismic Targets"; Co-I with PI S. Mathur, Las Cumbres Observatory NRES spectrograph (2018A–2020A)

Teaching

- Teaching assistant for PHSX 205 "College Physics I" (introductory mechanics for non-science/engineering majors) for three semesters during the 2011–2013 academic years. Interactive mentoring for weekly two-hour physics tutorial & laboratory sessions. Developed introductory "mini-lectures" at the beginning of each session. Tutored students during office hours. Graded weekly homework and four exams per semester. Attended weekly pre-tutorial teacher training sessions.
- Teaching assistant for PHSX 222 "Physics II (w/Calculus)" (introductory electricity & magnetism for science/engineering majors) for spring 2012 semester. Guided students through two-hour physics laboratory sessions. Developed introductory "mini-lectures" at the beginning of each session, graded lab-specific homeworks and course exams.
- Teaching assistant for ASTR 110 "Introduction to Astronomy: Mysteries of the Sky" for two semesters during the 2012–2013 academic years. Graded weekly homeworks and proctored exams.
- Tutored physics students for two hours per week in the MSU Physics Help Center for each semester of the 2011–2013 academic years. Guided students of various introductory physics courses through problems using group whiteboard and one-on-one interactions.

Education & Outreach

- Mentored University of Wyoming computer science graduate student Mehdi Nourelahi on the project "Analysis of the Sun's polarized spectrum using machine learning algorithms" (summer 2020)

- Mentored Research Experience for Undergraduates (REU) student Jonathan Roberts (University of Florida) on the project "Variation of Small-Scale Solar Magnetic Fields with Hinode" (summer 2020)
- "CSU Little Shop of Physics 29th Annual Open House" Hands-on demonstrations for the general public, Colorado State University, Fort Collins, CO (Feb 2020)
- Presented "The Dynamic Magnetic Behavior of Stars" to a general audience at a meeting of the Longmont Astronomical Society (Jun 2019)
- Topic expert for the University of Colorado Fiske Planetarium solar magnetism lobby exhibit development team (Oct 2018–Jan 2020)
- Mentored Research Experience for Undergraduates (REU) students Sabrina Poulsen (Ohio State University) and Adam Goga (Coastal Carolina University) at HAO on the project "New Observations of Magnetic Variability in Sun-like Stars" using Las Cumbres Observatory/NRES spectroscopy (summers of 2018 & 2019)
- "Numerical analysis in Python for astronomers/solar physicists." Tutorial given to Boulder area (CU/LASP/NSO/HAO) REU students (May 2018) and HAO scientists (Jun 2018)
- "Super Science Saturday: Magnetism Demonstration." Hands-on demonstrations for the general public, NCAR Mesa Lab, Boulder, CO (Annually in Nov, 2017–2019)
- Solar eclipse presentation to pre-school children and teachers, KinderCare Learning Center at UCAR, Boulder, CO (Aug 2017)
- "Total Solar Eclipse 2017 – Don't Miss It!" Built tabletop experiment showing how a solar eclipse reveals the corona. Demonstrated to grade-school students at Hygiene Elementary School and the general public at NCAR's "Super Science Saturday" (Nov 2016)
- "A Física e o Grande Acelerador do CERN." Presentation to middle-school students, Colegio Fenix, Petrópolis, Brazil (Sep 2010)

Publications

Astrophysics, of Primary Authorship

1. **Ricky Egeland**. The Solar-Stellar Dynamo-Irradiance Connection. In *IAU General Assembly*, pages 365–368, Mar. 2020, doi: 10.1017/S1743921319004630
2. P. G. Judge, **R. Egeland**, and G. W. Henry. Sun-like Stars Shed Light on Solar Climate Forcing. ApJ, 891(1):96, Mar. 2020, doi: 10.3847/1538-4357/ab72a9
3. T. S. Metcalfe and **R. Egeland**. Understanding the Limitations of Gyrochronology for Old Field Stars. ApJ, 871:39, Jan 2019, doi: 10.3847/1538-4357/aaf575
4. **R. Egeland**. Deconvolving the HD 81809 binary: rotational and activity evidence for a subgiant with a Sun-like cycle. ApJ, 866(2), Oct. 2018b, doi: 10.3847/1538-4357/aadf86
5. **R. Egeland**. sunstardb: A Database for the Study of Stellar Magnetism and the Solar-stellar Connection. ApJS, 236:19, May 2018a, doi: 10.3847/1538-4365/aab771
6. P. G. Judge, **R. Egeland**, T. S. Metcalfe, E. Guinan, and S. Engle. The Magnetic Future of the Sun. ApJ, 848:43, Oct. 2017, doi: 10.3847/1538-4357/aa8d6a
7. **R. Egeland**, W. Soon, S. Baliunas, et al. The Mount Wilson Observatory S-index of the Sun. ApJ, 835(1), January 2017b, doi: 10.3847/1538-4357/835/1/25
8. **R. Egeland**, W. Soon, S. Baliunas, J. C. Hall, and G. W. Henry. Evolution of Long Term Variability in Solar Analogs. In D. Nandy, A. Valio, and P. Petit, editors, *Living Around Active Stars*, IAU Symposium 328, pages 329–337, Oct. 2017a, doi: 10.1017/S1743921317004173
9. **R. Egeland**, W. Soon, S. Baliunas, et al. Dynamo Sensitivity in Solar Analogs with 50 Years of Ca II H & K Activity. In G. A. Feiden, editor, *Proceedings of the 19th Cambridge Workshop on Cool Stars,*

Stellar Systems, and the Sun. Zenodo, Sept. 2016, doi: `10.5281/zenodo.154118`

10. T. S. Metcalfe, **R. Egeland**, and J. van Saders. Stellar Evidence That the Solar Dynamo May Be in Transition. ApJ, 826:L2, July 2016, doi: `10.3847/2041-8205/826/1/L2`

11. **R. Egeland**, T. S. Metcalfe, J. C. Hall, and G. W. Henry. Sun-like Magnetic Cycles in the Rapidly-rotating Young Solar Analog HD 30495. ApJ, 812:12, Oct. 2015, doi: `10.1088/0004-637X/812/1/12`

12. P. G. Judge and **R. Egeland**. Century-long monitoring of solar irradiance and Earth's albedo using a stable scattering target in space. MNRAS, 448:L90–L93, Mar. 2015, doi: `10.1093/mnrasl/slv004`

Astrophysics, as Contributing Author

1. K. Hambleton, F. Bianco, G. Clementini, et al. Impact of Rubin Observatory LSST Template Acquisition Strategies on Early Science from the Transients and Variable Stars Science Collaboration: Non-time-critical Science Cases. *Research Notes of the American Astronomical Society*, 4(3):40, Mar. 2020, doi: `10.3847/2515-5172/ab8129`

2. William J. Chaplin, Aldo M. Serenelli, Andrea Miglio, et al. Age dating of an early Milky Way merger via asteroseismology of the naked-eye star ν Indi. *Nature Astronomy*, 4:382–389, Jan. 2020, doi: `10.1038/s41550-019-0975-9`

3. Suyog Garg, Bidya Binay Karak, **Ricky Egeland**, Willie Soon, and Sallie Baliunas. Waldmeier Effect in Stellar Cycles. ApJ, 886(2):132, Dec. 2019, doi: `10.3847/1538-4357/ab4a17`

4. Scott W. McIntosh, Robert J. Leamon, **Ricky Egeland**, et al. What the Sudden Death of Solar Cycles Can Tell Us About the Nature of the Solar Interior. $\mathrm{Sol.\ Phys.}$, 294(7):88, Jul 2019, doi: `10.1007/s11207-019-1474-y`

5. Daniel Huber, Sarbani Basu, Paul Beck, et al. Stellar Physics and Galactic Archaeology using Asteroseismology in the 2020's. BAAS, 51(3):488, May 2019

6. W. Soon, V. M. Velasco Herrera, R. G. Cionco, et al. Covariations of chromospheric and photometric variability of the young Sun analogue HD 30495: evidence for and interpretation of mid-term periodicities. MNRAS, 483(2):2748–2757, Feb 2019, doi: `10.1093/mnras/sty3290`

7. C. Karoff, T. S. Metcalfe, Â. R. G. Santos, et al. The Influence of Metallicity on Stellar Differential Rotation and Magnetic Activity. ApJ, 852:46, Jan. 2018, doi: `10.3847/1538-4357/aaa026`

8. P. G. Beck, J.-D. do Nascimento, Jr., T. Duarte, et al. Lithium abundance and rotation of seismic solar analogues. Solar and stellar connection from Kepler and Hermes observations. $\mathrm{A\&A}$, 602:A63, June 2017, doi: `10.1051/0004-6361/201629820`

9. P. G. Beck, D. Salabert, R. A. Garcia, et al. Probing Seismic Solar Analogues Through Observations With The NASA Kepler Space Telescope and Hermes High-Resolution Spectrograph. In *19th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun (CS19)*, page 42, Nov. 2016, doi: `10.5281/zenodo.166507`

10. D. Salabert, R. A. Garcia, P. G. Beck, et al. The Solar-Stellar Connection: Magnetic Activity Of Seismic Solar Analogs. In *19th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun (CS19)*, page 30, Aug. 2016b, doi: `10.5281/zenodo.159255`

11. D. Salabert, C. Régulo, R. A. García, et al. Magnetic variability in the young solar analog KIC 10644253. Observations from the Kepler satellite and the HERMES spectrograph. $\mathrm{A\&A}$, 589:A118, May 2016c, doi: `10.1051/0004-6361/201527978`

12. D. Salabert, R. A. García, P. G. Beck, et al. Photospheric and chromospheric magnetic activity of seismic solar analogs. Observational inputs on the solar-stellar connection from Kepler and Hermes. $\mathrm{A\&A}$, 596:A31, Nov. 2016a, doi: `10.1051/0004-6361/201628583`

Computing & High-Energy Physics, of Primary Authorship

1. A. Sanchez-Hernandez, **R. Egeland**, C.-H. Huang, et al. From toolkit to framework - the past and future evolution of PhEDEx. In *Journal of Physics Conference Series*, volume 396, page 032118, Dec. 2012, doi: 10.1088/1742-6596/396/3/032118

2. **R. Egeland**, C.-H. Huang, P. Rossman, P. Sundarrajan, and T. Wildish. The PhEDEx next-gen website. In *Journal of Physics Conference Series*, volume 396, page 032117, Dec. 2012, doi: 10.1088/1742-6596/396/3/032117

3. T. Chwalek, **R. Egeland**, O. Gutsche, et al. No file left behind - monitoring transfer latencies in PhEDEx. In *Journal of Physics Conference Series*, volume 396, page 032089, Dec. 2012, doi: 10.1088/1742-6596/396/3/032089

4. **R. Egeland**, T. Wildish, and C.-H. Huang. PhEDEx Data Service. In *Journal of Physics Conference Series*, volume 219, page 062010, Apr. 2010, doi: 10.1088/1742-6596/219/6/062010

5. **R. Egeland**, T. Wildish, and S. Metson. Data transfer infrastructure for CMS data taking. In *Proceedings of XII Advanced Computing and Analysis Techniques in Physics Research*, page 33, Erice, Italy, 2008. doi: 10.22323/1.070.0033

6. **R. Egeland**, F. Cavallari, G. Organtini, et al. Database requirements for the CMS ECAL. CMS Internal Note 2005/029, CERN, May 2005

Computing & High-Energy Physics, as Contributing Author

1. CMS Collabortion. A New Boson with a Mass of 125 GeV Observed with the CMS Experiment at the Large Hadron Collider. *Science*, 338:1569, Dec. 2012, doi: 10.1126/science.1230816

2. CMS Collaboration. Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC. *Physics Letters B*, 716:30–61, Sept. 2012, doi: 10.1016/j.physletb.2012.08.021

3. S. Metson, D. Bonacorsi, M. Dias Ferreira, and **R. Egeland**. SiteDB: Marshalling people and resources available to CMS. In *Journal of Physics Conference Series*, volume 219, page 072044, Apr. 2010, doi: 10.1088/1742-6596/219/7/072044

4. A. Fanfani, A. Afaq, J. A. Sanches, et al. Distributed analysis in CMS. *Journal of Grid Computing*, 8 (2):159–179, Jun 2010. ISSN 1572-9184, doi: 10.1007/s10723-010-9152-1

5. R. Arcidiacono, W. Badgett, U. Berthon, et al. The CMS ECAL database services for detector control and monitoring. In *Journal of Physics Conference Series*, volume 219, page 022016, Apr. 2010, doi: 10.1088/1742-6596/219/2/022016

6. G. Bagliesi, L. Bauerdick, S. Belforte, et al. The CMS data transfer test environment in preparation for LHC data taking. In *2008 IEEE Nuclear Science Symposium Conference Record*, pages 3475–3482, Oct 2008, doi: 10.1109/NSSMIC.2008.4775085

7. L. Tuura, B. Bockelman, D. Bonacorsi, et al. Scaling CMS data transfer system for LHC start-up. In *Journal of Physics Conference Series*, volume 119, page 072030, July 2008, doi: 10.1088/1742-6596/119/7/072030

8. S. Metson, S. Belforte, B. Bockelman, et al. CMS offline web tools. In *Journal of Physics Conference Series*, volume 119, page 082007, July 2008, doi: 10.1088/1742-6596/119/8/082007

9. A. Delgado Peris, A. Fanfani, F. Farina, et al. Data Location, Transfer and Bookkeeping in CMS. *Nuclear Physics B Proceedings Supplements*, 177:279–280, Mar. 2008, doi: 10.1016/j.nuclphysbps.2007.11.128

10. CMS Collaboration. The CMS experiment at the CERN LHC. *Journal of Instrumentation*, 3:S08004, Aug. 2008, doi: 10.1088/1748-0221/3/08/S08004

11. F. Cavallari, S. Costantini, I. Dafinei, et al. CMS ECAL intercalibration of ECAL crystals using laboratory measurements. Technical Report CMS-NOTE-2006-073, CERN, Geneva, May 2006. URL

https://cds.cern.ch/record/962038

12. CMS Collaboration. *CMS: The Computing Project: Technical Design Report*. Number CERN-LHCC-2005-023 in Technical Design Report CMS. CERN, Geneva, 2005. URL https://cds.cern.ch/record/838359. Submitted on 31 May 2005

13. A. Bartoloni, F. Cavallari, I. Dafinei, et al. CMS ECAL Barrel channel numbering. CMS Internal Note 2005/021, CERN, April 2005

14. D. Bailleux, I. Britvitch, K. Deiters, et al. Hamamatsu APD for CMS ECAL: quality insurance. *Nuclear Instruments and Methods in Physics Research A*, 518:622–625, Feb. 2004, doi: 10.1016/j.nima.2003.11.102

15. Z. Antunovic, A. Britvitch, K. Deiters, et al. Radiation hard avalanche photodiodes for CMS ECAL. In Sandra Claude, editor, *9th Workshop on Electronics for LHC Experiments*, CERN Yellow Reports: Conference Proceedings, pages 386–388, Geneva, November 2003. doi: 10.5170/CERN-2003-006. 29 Sep – 3 Oct 2003, Amsterdam, The Netherlands

Presentations

1. "Rotation, Spindown, & Activity" NSO Solar Focus Series: Solar-Stellar Connection, *Virtual*, (May 2020)
2. "StokesPy: An Introduction" Python in Heliophysics Spring 2020 Meeting, *Virtual* (May 2020)
3. "What Other Sun-like Stars Teach Us about the Sun" Michael Knoelker Symposium, Boulder, Colorado (Invited: Feb 2020, video)
4. "Is the Sun in a transitory state of its dynamical evolution?" Michael J. Thompson Workshop, Boulder, Colorado (Sep 2019)
5. "The Cosmic Dynamo Joke and the Search for Dark Magnetism" Solar Heliospheric and Interplanetary Environment (SHINE) Workshop, Boulder, Colorado (Invited; Aug 2019)
6. "Establishing Photometric Variability as a Magnetic Activity Proxy in Sun-like Stars" HAO Colloquium, High Altitude Observatory (NCAR), Boulder, CO (May 2019, video)
7. "Rotation, Activity, and Long-Term Variability of Sun-Like Stars" International Space Science Institute Meeting, Bern, Switzerland (Invited; Feb, 2019)
8. "The Solar-Stellar Dynamo-Irradiance Connection: What Stellar Lightcurves Tell Us About How the Dynamo Works" IAU 30th General Assembly, Focus Meeting 9, Vienna, Austria (Invited; Aug 2018)
9. "The Rarity of Sun-like Cycles and their Dependence on the Rossby Number" Cool Stars 20, Boston, MA (Contributed plenary; Jul 2018, video)
10. "What PEPSI Spectropolarimetry Might Teach Us About the Sun-as-a-Star, and Peculiarities in Stellar Activity-Rotation-Variability Relationships" NSO/PEPSI Workshop, Potsdam, Germany (Jun 2018)
11. "Long-Term Variability of the Sun in the Context of Solar-Analog Stars" AAS 232, Denver, CO (contributed thesis talk; Jun 2018)
12. "A Critical Rossby Number for Sun-like Variability" Lowell Observatory Colloquium, Flagstaff, AZ (Invited; Apr 2018)
13. "A Critical Rossby Number for Sun-like Variability" University of Minnesota Space Physics Seminar, Minneapolis, MN (Invited; Feb 2018)
14. "A Critical Rossby Number for Sun-like Variability" Poster at the Solar Heliospheric and Interplanetary Environment (SHINE) Workshop, Saint-Sauveur, Quebec, Canada (Jul 2017)
15. "The Great American Eclipse" NCAR Day of Networking and Discovery, Boulder, CO (Invited, Apr 2017)
16. "A Critical Rossby Number for Sun-like Variability" HAO Colloquium, High Altitude Observatory (NCAR), Boulder, CO (Apr 2017, video)

17. "The Rarity of the Solar Cycle" Georgia State University Colloquium, Atlanta, GA (Invited; Jan 2017)
18. "Evolution of Chromospheric Activity in Solar Analogs" IAU Symposium 328: Living around Active Stars, Maresias, Brazil (Invited; Oct 2016)
19. "Dynamo Sensitivity in Solar Analogs with 50 Years of Ca II H & K Activity" Cool Stars 19, Uppsala, Sweden (Contributed plenary; Jun 2016)
20. "The Solar Dynamo Zoo" Poster at Cool Stars 19, Uppsala, Sweden (Jun 2016)
21. "Dynamo Sensitivity in Solar Analogs with 50 Years of Ca II H & K Activity" American Astronomical Society Solar Physics Division meeting #47, Boulder, CO (Jun 2016)
22. "The Solar Dynamo Zoo" Poster at the American Astronomical Society Solar Physics Division meeting #47, Boulder, CO (Jun 2016)
23. "Variability of Sun-like Stars in 50 Years of Synoptic Observations" Boulder Solar Day, Boulder, CO (Invited; Mar 2016)
24. "Century-Long Monitoring of Solar Irradiance and Earth's Albedo Using a Stable Scattering Target in Space" 2015 Sun-Climate Symposium, Savannah, GA (Nov 2015)
25. "Sun-like Magnetic Cycles in the Fast-Rotating Young Solar Analog HD 30495" IAU 29th General Assembly, Honolulu, HI (Aug 2015)
26. "GeoSphere" HAO Colloquium, High Altitude Observatory (NCAR), Boulder, CO (Mar 2015, video)
27. "Insights on the solar dynamo from stellar observations" 224th meeting of the American Astronomical Society, Boston, MA (Jun 2014)
28. "Data Mining for Solar Physics: new approaches in the face of the data deluge" Montana State University RelAstro Seminar, Bozeman, MT (Nov 2012)
29. "Sugestões para Código Sustentável e Confiável pelo Futuro" LIneA IT Week, Observatório Nacional, Rio de Janeiro, Brazil (May 2011)
30. "PhEDEx Data Service" CHEP09 Computing for High Energy Physics, Prague, Czech Republic (Mar 2009)
31. "Data transfer infrastructure for CMS data taking"; Advanced Computing and Analysis Techniques, Erice, Italy (Nov 2008)
32. "Neutrino Sky Telescope" UROP project presentations, University of North Dakota, Grand Forks, ND (Aug 2000)

News & Press

- David Hosansky "Scientists Find Clues to Solar Variability in Observations of Other Stars" (news.ucar.edu, Jun 15, 2020)
- Adam Mann, New York Times "There's Something Special About the Sun: It's a Bit Boring" (nytimes.com, online Apr 30, 2020; print May 19, 2020)
- Travis Metcalfe, Boulder Weekly "Watching stellar heartbeats" (boulderweekly.com, Apr 4, 2019)
- Leah Crane, New Scientist "Fresh look at old data shows the sun is surprisingly sluggish" (newscientist.com, Dec 9, 2016)
- Leonardo dos Santos, Astrobites/AAS Nova "It Turns Out the Sun Is More Chill Than We Previously Thought" (aasnova.org, Nov 29, 2016)
- Evelyn Boswell, MSU News "MSU grad student receives Newkirk Fellowship to study solar cycles" (montana.edu, Apr 17, 2014)

Service

- Member of International Space Science Institute team 446, "Linking solar and stellar variabilities," team leader A. Shapiro
- Subgroup Contact for the Large Synoptic Survey Telescope (LSST) Transients and Variable Stars Science Collaboration: Magnetically Active Stars Subgroup (Feb 2018–present)
- NCAR Early Career Scientist Association steering committee (HAO representative; Nov 2017–present)
- Splinter session organizer & chair, "Solar Magnetic Activity and Solar-Stellar Connections", Solar Heliospheric and Interplanetary Environment (SHINE) Workshop, Saint-Sauveur, Quebec, Canada (Jul 2017)
- Referee of 2 papers for journals ApJ and MNRAS (2017–2018)
- Served on NSF grant selection panel (2018)

Grants & Awards

Average NSF/NASA grant review scores normalized to 5-point scale: **3.8** (N=4).

- NASA Heliophysics Data Environment Enhancement grant for "SunPy support for multidimensional data and spectropolarimetric analysis" ($50k; 2020)
- Awarded associate research position to develop a pipeline and perform a validation of DKIST level-2 spectropolarimetric inversion data products for the solar chromosphere as part of the NSF grant "Harnessing the DKIST Data Revolution" (PI H. Uitenbroek, NSO; 2019–2020)
- IAU General Assembly Travel Grant; 750 €, (Aug 2018)
- AAS International Travel Grant; $1950 (Aug 2018)
- AAS Solar Physics Division Thomas Metcalfe Travel Award; $1750 (Oct 2016)
- Excellent Teaching Assistant; Montana State University, Bozeman, MT; $150 (May 2014)
- AAS Solar Physics Division Studentship Travel Award; $750 (Apr 2014)
- Newkirk Fellowship; High Altitude Observatory/NCAR, Boulder, CO; $35k/year (Mar 2014)

Software Projects

- sunstardb: activity time series and fundamental properties of magnetically active stars (2014–present; github, website, twitter)
- STABLE: 3D Babcock-Leighton dynamo model (2017; private repository)
- LIneA Science Portal: cluster-based scientific workflow manager for the Dark Energy Survey (2011; private repository, website, twitter)
- PhEDEx: CMS experiment data transfer manager (2006–2010; github, website)
- CMSSW Conditions Database: online and offline detector calibrations (2005–2007; github, website)
- CMS Construction Databases: detector component testing and property tracking (2002–2005; private repository)

Skills

Algorithms

Association rule learning (e.g. Apriori); Bayesian network structure learning, parameter learning, and inference.

Analysis

Spectral density estimation of unevenly-sampled series; Monte Carlo techniques in estimating uncertainty; curve fitting and regression analysis.

Programming Languages

Extensive experience with Python, Perl, C, C++, Java, PHP, Javascript, SQL and Oracle PL/SQL. Routine use of Bash shell scripts. Some exposure to FORTRAN and IDL.

Development Tools

CVS, SVN and Git repositories. RPM packages. Savannah and Trac ticket management. Emacs text editor.

Operating Systems

Extensive experience with Linux and Mac OS X. Linux experience extends to advanced use such as kernel configuration, deploying and configuring mail, web, and database servers, creating and installing RPMs, and knowledge with many standard command-line tools for debugging a running system.

Databases

Experience with Oracle schema design and performance considerations, SQL and SQL performance tuning; language interfaces such as Perl DBI, Java JDBC, and C++ OCCI; performance analysis using Oracle Enterprise Manager; and scale testing large applications. Similar experience with MySQL and PostgresSQL schema, SQL, language bindings, and application development, but also including server deployment, configuration, backup, and administration of production database servers.

Web Technologies

Experience with the development of dynamic web interfaces using server-side and client-side programming utilizing a database backend. Developed data-centric web services providing HTML, XML, or JSON formatted data. Experience with client-side application development in Javascript using Ajax techniques, as well as the use of the Yahoo! User Interface library for developing rich client-side applications. Experience with building and configuring Apache httpd web server for production deployment environments, including secure X509 certificate authentication.

Distributed Computing

Experience with European and US grid computing tools and technologies, including the SRM storage access interface and gLite data transfer tools. Experience with designing systems for managing data across multiple computer centers at the petabyte scale.

Project Management

Experience with planning a critical project within the framework of a large and novel effort in computing and as part of an international scientific collaboration; scheduling work and organizing meetings for a small team of developers; maintaining communications with multiple related or dependent sub-projects and addressing their concerns; responding to emergencies; and presenting project plans and achievements to a larger group of collaborators.

Human Languages

Native English. Intermediate spoken and written Portuguese. Basic spoken French.