Brian Kloppenborg

Astrophysicist and Entrepreneur

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I am a Research Scientist whose diverse portfolio of work experiences have proven my ability to be agile, adapt to different roles, and drive teams to success. I hold a Ph.D. in Physics (with an astrophysics specialization) and have strong backgrounds in mathematics and computer science. I presently work on topics related to phased array radars, space domain awareness, and missile defense. I have 10+ years of experience in software development with contributions to a multitude of open source projects, including the Linux kernel. My most recent accomplishments include appointments to Government Lead Engineer on a $60M program, Lead Engineer and Product Owner on a $36M program, Proposal Author for an RFI that resulted in a sole-source $24M RFP, and Project Director or Task Lead on a variety of small programs. Throughout my career, I have developed a variety of academic research programs that received more than $1.5M in cumulative funding.

Education

2012 **Ph.D. Physics**, *University of Denver*, Denver, CO.
Dissertation: *Interferometric, Astrometric, and Photometric studies of epsilon Aurigae: Seeing the disk around a distant star.* **Advisor**: Dr. Robert Stencel

2006 **B.A. Physics**, *Hastings College*, Hastings, NE.
Minors: Mathematics, Computer Science. **Senior Project**: *Design, Construction and Implementation of a Radio Telescope to Study Neutral Hydrogen* **Advisor**: Dr. James Dugan

Work Experience

2022-present **Executive Director**, *American Association of Variable Star Observers*, Cambridge, MA.
Lead an international astronomy-focused non-profit. Supervised staff and volunteers to advance the mission of the AAVSO. Fostered collaboration between amateur and professional astronomers. Maintained a high level of member satisfaction. Preserved sound financial position of the organization.

2016-2022 **Research Scientist II**, *Georgia Tech Research Institute*, Atlanta, GA.
Conducted applied research for sponsored and internal projects; served as a Government advisor on multiple projects, lead small- to medium-sized teams; and secured funding through business development, grants, and proposals. Completed GTRI Project Director training.

- **Roles:** Government Lead Engineer , Lead Engineer and Product Owner , Proposal Author on Optical Detection for Space Situational Awareness (ODESSA, $1M), Business Developer and Program Manager , Task Lead , and Team Member
- **Accomplishments:** Built an engineering team from the ground-up for a $36M program by defining its technical direction (from milestones to daily tasking), managing a team of 30 engineers, projecting staffing needs, identifying risks, and communicating with the sponsor.

2016-2020 **Founder**, *Pratum Labs, LLC*, Atlanta, GA and Colorado Springs, CO.

Established a consulting firm that provided expertise in big data, machine learning, and GPU accelerated computing. Bootstrapped this business from nothing to a $40k / yr company during nights/evenings while working full time at GTRI.

- **Roles:** Founder, Project Director, Lead Engineer, Grants Administrator, Business Developer, and Accountant.

2014-2016 **Research Scientist**, *ArrayFire*, Atlanta, GA.

Developed high-performance computing software with applications in cybersecurity, graph analytics, physics, and image processing. Developed SBIR proposals for DARPA, DoE, NIH, DoT, and NASA. Managed grants and contracts from multiple sponsors totaling $387k. Created training materials and presentations for two-day and four-day courses on OpenCL for Xilinx FPGAs; CUDA for NVIDIA GPUs; and OpenCL for AMD, Intel, and NVIDIA GPUs.

- **Roles:** Project Director, Grants Administrator, Software Developer, Instructor, Business Developer, Advisor to Executive Board.
- **Accomplishments:** Successfully solicited, proposed, managed, and executed $795k of business opportunities in one year.
- **Open Source Contributions:** ArrayFire and Celero libraries.

2013-2014 **Sponsor Funded Professional - Research Associate**, *Georgia State University*, Atlanta, GA.

Developed proposals and applied optical interferometry to a variety of astronomical objects. Research topics include spotted stars, rapidly rotating stars, Young Stellar Objects (YSOs like Herbig and T Tauri), eruptive YSO variables (FUor, EXor, and UXor), and Novae (2013 Del, 2013 Cen). Developed software for model fitting and image reconstruction.

- **Roles:** Researcher, Software Developer
- **Open Source Contributions:** SIMTOI and LibOI (discussed further below)

2012-2013 **Postdoctoral Fellow**, *Max-Planck-Institut für Radioastronomie*, Bonn, Germany.

Developed proposals for the application of optical interferometry to Young Stellar Objects (YSOs like Herbig and T Tauri) and eruptive YSO variables.

- **Roles:** Researcher, Software Developer
- **Open Source Contributions:** MultiNest (Bayesian numerical optimization library)

2008-2012 **Graduate Research Assistant**, *University of Denver*, Denver, CO.

Performed research on stars (mostly epislon Aurigae) using long baseline optical interferometry, numerical modeling, NIR spectroscopy, and photometry. Developed and submitted proposals for time on MOST, Spitzer, SOFIA, WYRO, Hubble, Hershel, and several ground-based observatories.

- **Roles:** Researcher
- **Open Source Contributions:** Control software for Optec's SSP-4 J/H-band photometer
- **Software Development:** Telescope control software for DU's Student Astronomy Lab.
- **Notable Item:** 9 months of high-altitude (14,128 ft, 4306 m) observing.

2006 **Undergraduate Research**, *Hastings College*, Hastings, NE.

Designed and constructed a radio telescope to study 21-cm line. Developed new, open-source control software for radio spectrometer. Assisted with the collection of optical photometric data.

- **Roles:** Student Researcher
- **Open Source Contributions:** New control suite for the Spectracyber II, a Radio Astronomy Supplies 21-cm radio spectrometer.
- **Senior Project:** *The Design, Construction, and implementation of a Radio Telescope to study Neutral Hydrogen Spectral Emissions*

Teaching Experience

2015-2017 **Adjunct Professor**, *Georgia State University*, Atlanta, GA.
Advised students on numerical modeling and HPC techniques.

2007-2008 **Research and Teaching Assistant**, *University of Denver*, Denver, CO.
Taught five sections of University Physics labs (electricity, magnetism, circuit design, Newtonian mechanics, thermodynamics) over one year. **Awards:** Received AAPT Outstanding Teaching Assistant Award

2005-2007 **Assistant to the Curator of Astronomy**, *Hastings Museum*, Hastings, NE.
Presented two or more planetarium shows to the public daily. Shows included live (unscripted) tours of *The Sky Tonight* or automated programs.

2003 **Laboratory Assistant**, *Hastings College*, Hastings, NE.
Provided assistance to the instructor of the Introduction to the Night Sky astronomy course.

Public Outreach

2006-present **Public Talks**, *Various Locations*.

- *The fringe field of long-baseline optical interferometry* for Platte Valley Astronomical Observers on 2022-02-19 and Colorado Springs Astronomical Society on 2021-11-16
- *Writing a dissertation about epsilon Aurigae and experience with Citizen Sky* for Citizen Sky Astro April Talks on 2012-04-28
- *Epsilon Aurigae: 200 Years of Astronomical History* for Platte Valley Astronomical Observers on 2021-07-28
- *DSLR Documentation and Reduction* for AAVSO Citizen Sky Workshop on 2010-09-03

2010-2012 **Citizen Sky Professional Liaison**, *American Association of Variable Star Observers*, Cambridge, MA.
Taught members of the public how to conduct variable star observations, reduce their own data, and publish their results in a peer-reviewed scientific journal. Functioned as the DSLR Photometry Team leader. Regularly blogged about professional research activities.

2005 **Volunteer**, *Hastings Literacy Foundation*, Hastings, NE.
Tutor for the GED program in the topics of science and mathematics.

2004-2007 **Observatory Assistant**, *Hastings College*, Hastings, NE.
Assisted the Observatory Director during two monthly public observing sessions. Guided the public through the constellations and explained basic astrophysical phenomena.

Grant and IRAD Funding

2018-2021 **$1M**, *Co-PI*, Optical Detection for Space Situational Awareness, GTRI SI IRAD.
A three-year Strategic Initiative IRAD focusing on Space Situational Awareness that will (1) Demonstrate verified modeling and simulation capabilities for satellites through lab-based measurements, advanced radiometric modeling, and ground-based observations; (2) Expand upon low-light detection and tracking capabilities. (3) Develop SSA-focused big data analytics capabilities. This project is a collaborative effort between GTRI and Georgia Tech Aerospace Engineering

2017 **$150k**, *PI Pro Tempore*, Smart Cities - Fog Computing, GTRI IRAD.
Investigated the suitability of Fog Computing to DoD applications involving real-time distributed video processing. Matured Georgia Tech's Mobile Fog software from TRL 3 to TRL 5. Evaluated performance of "the Fog" under degraded networking conditions.

2016 **$146k**, *PI*, Accelerating Biometical Image Processing using Massively Parallel Processors, NIH SBIR R43-LM012359-01.

Accelerate commonly used medical imaging and medical image reconstruction software using GPUs. Created drop-in replacement for Kitware's popular Insight Segmentation and Registration Toolkit (ITK) software. Grant transfered to Dr. Melonakos upon my departure from ArrayFire.

2015 **$92k**, *PI*, ArrayFire Graph - A GPU Acclerated Graph Framework, DARPA SBIR D152-004-0022.

Created a prototype *dynamic* graph data structure suitable for deployment on massively parallel processors. Ported this data structure to the GPU. Delivered superior (4x faster) performance compared to NVIDIA's *static* graph library, NVGraph.

2015 **$149k**, *PI*, ArrayFire Argos - A High-Performance Cybersecurity Framework, DOE SBIR DE-SC0013181.

Developed a statistics-based cybersecurity solution for high-throughput (40 Gbps+) network connections. Provided similar performance to a $120k dedicated box from Cisco using $15k of hardware, but at a cost of significantly greater latency (200 ms vs. 1 ms).

Service

2021-present **Treasurer**, *Hillsboro Condominium Owners Association*, Colorado Springs, CO.

2013 **Editor, DSLR Observing Manual**, *American Assoication of Variable Star Observers*, Cambridge, MA.

Other Experience

C/C++	2008 - present	Windows	1998 - present
git	2008 - present	Linux	2008 - present
Python	2008 - present	Fusion 360	2020 - present
OpenCL	2010 - 2016	3D Printing	2020 - present
CUDA	2015 - 2018		

Peer Reviewed Publications

Labdon, A., Kraus, S., Davies, C. L., Kreplin, A., Kluska, J., Harries, T. J., Monnier, J. D., Brummelaar, T., Baron, F., Millan-Gabet, R., **Kloppenborg, B.**, Eisner, J., Sturmann, J., Sturmann, L., "Dusty disk winds at the sublimation rim of the highly inclined, low mass young stellar object SU Aurigae". In: *Astronomy & Astrophysics* 627 (July 2019), A36. ISSN: 0004-6361.

Levine, S., Henden, A., Terrell, D., Welch, D., **Kloppenborg, B.,** "AAVSO – Solar System Objects and the AAVSO Photometric All-Sky Survey (APASS) (Abstract)". In: *Journal Of The American Association Of Variable Star Observers* 47.1 (2019), pp. 1–10.

Davies, C. L., Kraus, S., Harries, T. J., Kreplin, A., Monnier, J. D., Labdon, A., **Kloppenborg, B.**, Acreman, D. M., Baron, F., Millan-Gabet, R., "Simultaneous spectral energy distribution and near-infrared interferometry modeling of HD 142666". In: *The Astrophysical Journal* 866.1 (2018), p. 23.

Setterholm, B. R., Monnier, J. D., Davies, C. L., Kreplin, A., Kraus, S., Baron, F., Aarnio, A., Berger, J.-P., Calvet, N., Curé, M., Kanaan, S., **Kloppenborg, B.**, Bouquin, J.-B. L., Millan-Gabet, R., Rubinstein, A. E., Sitko, M. L., Sturmann, J., Brummelaar, T. A., Touhami, Y., "Probing the Inner Disk Emission of the Herbig Ae Stars HD 163296 and HD 190073". In: *The Astrophysical Journal* 869.2 (Dec. 2018), p. 164. ISSN: 1538-4357.

Neilson, H. R., Baron, F., Norris, R., **Kloppenborg, B.**, Lester, J. B., "Stellar Atmospheres, Atmospheric Extension, and Fundamental Parameters: Weighing Stars Using the Stellar Mass Index". In: *The Astrophysical Journal* 830.2 (Aug. 2016), p. 103. ISSN: 0004-637X.

Kloppenborg, B. K., Stencel, R. E., Monnier, J. D., Schaefer, G. H., Baron, F., Tycner, C., Zavala, R. T., Hutter, D., Zhao, M., Che, X., Ten Brummelaar, T. A., Farrington, C. D., Parks, R., McAlister, H. A., Sturmann, J., Sturmann, L., Sallave-Goldfinger, P. J., Turner, N., Pedretti, E., Thureau, N., "Interferometry of Aurigae: Characterization of the asymmetric eclipsing disk". In: *Astrophysical Journal, Supplement Series* 220.1 (Aug. 2015), pp. 1–22. ISSN: 00670049.

Schaefer, G. H., Brummelaar, T., Gies, D. R., Farrington, C. D., **Kloppenborg, B.**, Chesneau, O., Monnier, J. D., Ridgway, S. T., Scott, N., Tallon-Bosc, I., McAlister, H. A., Boyajian, T., Maestro, V., Mourard, D., Meilland, A., Nardetto, N., Stee, P., Sturmann, J., Vargas, N., Baron, F., Ireland, M., Baines, E. K., Che, X., Jones, J., Richardson, N. D., Roettenbacher, R. M., Sturmann, L., Turner, N. H., Tuthill, P., Belle, G., Braun, K., Zavala, R. T., Banerjee, D. P. K., Ashok, N. M., Joshi, V., Becker, J., Muirhead, P. S., "The expanding fireball of Nova Delphini 2013". In: *Nature* 515.7526 (Nov. 2014), pp. 234–236. ISSN: 1476-4687.

Kloppenborg, B. K., Pieri, R., Eggenstein, H.-B., Maravelias, G., Pearson, T., "A Demonstration of Accurate Wide-field V-band Photometry Using a Consumer-grade DSLR Camera". In: *Journal Of The American Association Of Variable Star Observers* 40 (Mar. 2013), pp. 815–833. ISSN: 0271-9053.

Kloppenborg, B. K., Hopkins, J. L., Stencel, R. E., "An Analysis of the Long-term Photometric Behavior of epsilon Aurigae". In: *The Journal of the American Association of Variable Star Observers* 40 (Mar. 2012), p. 647. ISSN: 0271-9053.

Price, A., Turner, R., Stencel, R. E., **Kloppenborg, B. K.**, Henden, A. A., "The origins and future of the citizen sky project". In: *Journal of the American Association of Variable Star Observers* 40 (2012), pp. 614–617.

Chadima, P., Harmanec, P., Bennett, P. D., **Kloppenborg, B.**, Stencel, R., Yang, S., Božić, H., Šlechta, M., Kotková, L., Wolf, M., Škoda, P., Votruba, V., Hopkins, J. L., Buil, C., Sudar, D., "Spectral and photometric analysis of the eclipsing binary epsilon Aurigae prior to and during the 2009–2011 eclipse". In: *Astronomy & Astrophysics* 530 (May 2011), A146. ISSN: 0004-6361.

Stencel, R. E., **Kloppenborg, B. K.**, Wall, R. E., Hopkins, J. L., Howell, S. B., Hoard, D. W., Rayner, J., Bus, S., Tokunaga, A., Sitko, M. L., Bradford, S., Russell, R. W., Lynch, D. K., Hammel, H., Whitney, B., Orton, G., Yanamandra-Fisher, P., Hora, J. L., Hinz, P., Hoffmann, W., Skemer, A., "Infrared studies of epsilon Aurigae in eclipse". In: *Astronomical Journal* 142.5 (Nov. 2011), p. 174. ISSN: 00046256.

Kloppenborg, B., Stencel, R., Monnier, J. D., Schaefer, G., Zhao, M., Baron, F., McAlister, H., Ten Brummelaar, T., Che, X., Farrington, C., Pedretti, E., Sallave-Goldfinger, P. J., Sturmann, J., Sturmann, L., Thureau, N., Turner, N., Carroll, S. M., "Infrared images of the transiting disk in the aurigae system". In: *Nature* 464.7290 (Apr. 2010), pp. 870–872. ISSN: 00280836.

Mais, D. E., **Kloppenborg, B.**, Stencel, R., "Adventures in Interferometry". In: *The Society for Astronomical Sciences 27th Annual Symposium on Telescope Science Held May 2022* 27 (2008), p. 77.

Stencel, R. E., Creech-Eakman, M., Hart, A., Hopkins, J. L., **Kloppenborg, B. K.**, Mais, D. E., "Interferometric Studies of the Extreme Binary epsilon Aurigae: Pre-Eclipse Observations". In: *The Astrophysical Journal* 689.2 (Oct. 2008), pp. L137–L140. ISSN: 0004-637X.

Technical Reports

Kloppenborg, B. *Software Development Pipelines*. Tech. rep. Colorado Springs, CO: Georgia Tech Research Institute, 2018, pp. 1–14.

Melonakos, J., **Kloppenborg, B.**, Aatish, K., Garigipati, P., *Online Threat in Social Networks Using Accelerators*. Tech. rep. Atlanta, GA: AccelerEyes, LLC DBA ArrayFire, Aug. 2015.

Books and Chapters

Kloppenborg, B., Belle, G., "Optical Interferometry of Giants and Supergiants". In: *Giants of Eclipse: The zeta Aurigae Stars and Other Binary Systems*. Vol. 408. 2015, pp. 157–168.

AAVSO Citizen Sky Team, ., Littlefield, C., Norris, P., Kinne, R., Templeton, M., Pieri, R., Jackson, R., Brewster, M., Templeton, M., Blackford, M., Eggenstein, H.-B., Connors, M., Doktor, I., Buchheim, R., Collins, D., Hager, T., Manske, B., Templeton, M., **Kloppenborg, B.**, Henden, A., Loughney, D., Simonsen, M., Brown, T., Valleli, P., *The AAVSO DSLR Observing Manual*. Ed. by Brian Kloppenborg. Version 1. Cambridge, MA: AAVSO, 2014, pp. 1–93.

Preprints

Parks, J. R., White, R. J., Baron, F., Monnier, J. D., **Kloppenborg, B.**, Henry, G., Scheafer, G., Che, X., Pedretti, E., Thureau, N., Zhao, M., Brummelaar, T., McAlister, H., Ridgway, S. T., Turner, N., Sturmann, J., Sturmann, L., "First Images of Cool Starspots on a Star Other than the Sun: Interferometric Imaging of lambda Andromedae". In: *eprint arXiv:1508.04755* (Aug. 2015), pp. 1–62.

Invited Talks

Kloppenborg, B. "Achieving innovation in the workplace: from solo inventor to government employee". In: *Artist Lecture Series*. Ed. by N/A. Vol. 1. 1. Hastings, NE: N/A, 2019, pp. 1–7.

Kloppenborg, B. K. "Interferometric results from the epsilon Aurigae eclipse: Its more than just images!" In: *AAS topical meetings: Giants of Eclipse*. Vol. 45. 2013.

Conference Proceedings

Kloppenborg, B., Churchill, L., Valenta, C., Gunter, B., Holzinger, M. J., "Optical Detection for Space Situational Awareness (ODESSA)". In: *AMOS Technical Conference*. Atlanta, GA: Georgia Tech Research Institute, 2018, pp. 1–12.

Kloppenborg, B. "Real-Time Visualization of CUDA Data using ArrayFire Forge". In: *GPU Technology Conference*. 2016.

Kloppenborg, B. "Interferometric Techniques for Binary Stars". In: *Resolving The Future Of Astronomy With Long-Baseline Interferometry Proceedings of a conference held 28-31 March 2011*. Vol. 487. 2014.

Monnier, J. D., Berger, J.-P., Le Bouquin, J.-B., Tuthill, P. G., Wittkowski, M., Grellmann, R., Müller, A., Renganswany, S., Hummel, C., Hofmann, K.-H., Schertl, D., Weigelt, G., Young, J., Buscher, D., Sanchez-Bermudez, J., Alberdi, A., Schoedel, R., Köhler, R., Soulez, F., Thiébaut, É., Kluska, J., Malbet, F., Duvert, G., Kraus, S., **Kloppenborg, B. K.**, Baron, F., Wit, W.-J., Rivinius, T., Merand, A., "The 2014 interferometric imaging beauty contest". In: *Optical and Infrared Interferometry IV*. Ed. by Jayadev K. Rajagopal, Michelle J. Creech-Eakman, and Fabien Malbet. Vol. 9146. International Society for Optics and Photonics, July 2014, 91461Q. ISBN: 9780819496140.

Antoniucci, S., Arkharov, A. A., Di Paola, A., Giannini, T., Kishimoto, M., **Kloppenborg, B.**, Larionov, V. M., Li Causi, G., Lorenzetti, D., Vitali, F., "EXORCISM: EXOR optiCal Infrared Systematic Monitoring". In: *Protostars and Planets VI*. 2013.

Kloppenborg, B., Baron, F., "Accelerating optical interferometric image reconstruction and modeling using graphical processing units (GPUs)". In: *Biomedical and Astronomical Signal Processing*. Villars-sur-Ollon, Switzerland, 2013, p. 42.

Baron, F., **Kloppenborg, B.**, Monnier, J., "Toward 5D image reconstruction for optical interferometry". In: *Optical and Infrared Interferometry III*. Ed. by Françoise Delplancke, Jayadev K. Rajagopal, and Fabien Malbet. Vol. 8445. Sept. 2012, p. 84451D. ISBN: 9780819491466.

Brummelaar, T. A., Sturmann, J., McAlister, H. A., Sturmann, L., Turner, N. H., Farrington, C. D., Schaefer, G., Goldfinger, P. J., **Kloppenborg, B.,** "Data analysis for the CHARA Array CLIMB beam combiner". In: *Optical and Infrared Interferometry III*. Ed. by Françoise Delplancke, Jayadev K. Rajagopal, and Fabien Malbet. Vol. 8445. Sept. 2012, p. 84453C. ISBN: 9780819491466.

Kloppenborg, B. K., K. B., "Summary and the Future of Studies of Epsilon Aurigae". In: 2011, p. 224.06.

Baron, F., **Kloppenborg, B.,** "GPU-accelerated image reconstruction for optical and infrared interferometry". In: *Optical and Infrared Interferometry II*. Ed. by William C. Danchi, Francoise Delplancke, and Jayadev K. Rajagopal. Vol. 7734. SPIE, July 2010, p. 77344D. ISBN: 9780819482242.

Baron, F., Monnier, J. D., **Kloppenborg, B.,** "A novel image reconstruction software for optical/infrared interferometry". In: *Optical and Infrared Interferometry II*. Vol. 7734. 1. International Society for Optics and Photonics, July 2010, p. 77342I. ISBN: 9780819482242.

Malbet, F., Cotton, W., Duvert, G., Lawson, P., Chiavassa, A., Young, J., Baron, F., Buscher, D., Rengaswamy, S., **Kloppenborg, B.**, Vannier, M., Mugnier, L., "The 2010 interferometric imaging beauty contest". In: *Optical and Infrared Interferometry II*. Ed. by Eli Atad-Ettedgui and Dietrich Lemke. Vol. 7734. International Society for Optics and Photonics, July 2010, 77342N. ISBN: 9780819482242.

Kloppenborg, B. K. "Design construction and implementation of a radio telescope to study neutral hydrogen". In: *Nebraska Academy of Sciences*. 2006.

Conference Posters

Levine, S., Henden, A., Terrell, D., Welch, D., **Kloppenborg, B.,** "Applications of the AAVSO Photometric All-Sky Survey (APASS) to observations of objects in our Solar System - NASA/ADS". In: *American Astronomical Society, DPS meeting Number 50*. 2019, pp. 1–1.

Henden, A. A., Levine, S., Terrell, D., Welch, D. L., Munari, U., **Kloppenborg, B. K.,** "APASS Data Release 10". In: *American Astronomical Society, AAS Meeting No. 232, id. 223.06*. Vol. 232. 2018.

Fischer, T. C., Crenshaw, D. M., Baron, F., **Kloppenborg, B. K.**, Pope, C. L., "Bayesian Model Selection in 'Big Data' Spectral Analysis". In: *American Astronomical Society*. 2015, pp. 1–1.

Parks, J., White, R. J., Plavchan, P., Monnier, J. D., Baron, F., Henry, G. W., **Kloppenborg, B. K.**, Che, X., Schaefer, G., Zhao, M., Jones, J., Pedretti, E., Thureau, N., Ten Brummelaar, T., Farrington, C. D., McAlister, H. A., Sturmann, J., Sturmann, L., Turner, N. H., Ridgway, S. T., "Stellar Rotation and Proto-Planetary Disks: What Interferometric Imaging and High Cadence Photometry Can Tell Us". In: *American Astronomical Society* 221 (2013).

Clover, J., Jackson, B. V., Buffington, A., Hick, P. P., **Kloppenborg, B.**, Stencel, R., "Analysis of Epsilon Aurigae light curve from the Solar Mass Ejection Imager". In: *American Astronomical Society*. Vol. 43. 2011.

Kloppenborg, B. K. "Spots, Eclipses, and Pulsation: The Interplay of Photometry and Optical Interferometric Imaging". In: *American Astronomical Society Meeting Abstracts #218*. Vol. 43. 2011, p. 114.03.

Kloppenborg, B. K., Hemenway, P., Jensen, E., Osborn, W., Stencel, R., "Towards A Full Orbital Solution For Epsilon Aurigae". In: *American Astronomical Society*. Vol. 43. 2011.

Kloppenborg, B. K., Price, A., Turner, R., Henden, A., Stencel, R., "Collaborative Research Efforts For Citizen Scientists". In: *American Astronomical Society*. Vol. 43. 2011.

Kloppenborg, B. K., Stencel, R. E., Price, A., Turner, R., Henden, A., "Development of DSLR Photometry as an Example of a Citizen Sky Team". In: *American Astronomical Society*. Vol. 43. 2011.

Price, A., Billings, G., Gary, B., **Kloppenborg, B.**, Henden, A., "High Speed UBV Photometry Of Epsilon Aurigae's 2009-2011 Eclipse". In: *American Astronomical Society*. Vol. 43. 2011.

Stencel, R. E., **Kloppenborg, B.**, Sitko, M., Rayner, J., Tokunaga, A., "Discovery Of Strong Helium 10830A Absorption In The Mid-eclipse Disk Of Epsilon Aurigae". In: *American Astronomical Society*. Vol. 43. 2011.

Turner, R., Price, A., Henden, A., Stencel, R., **Kloppenborg, B.,** "Citizen Sky, An Update on the AAVSO's New Citizen Science Project". In: *American Astronomical Society*. Vol. 43. 2011.

Kloppenborg, B. K., Stencel, R. E., Hopkins, J. L., "Epsilon Aurigae - Two-year Totality Transpiring". In: *American Astronomical Society*. Vol. 42. 2010, p. 282.

Turner, R., Price, A., **Kloppenborg, B.**, Henden, A., "Citizen Sky, Solving the Mystery of epsilon Aurigae". In: *American Astronomical Society* 42 (2010), p. 509.

Software Projects

Kloppenborg, B., Yalamanchili, P., Mohammed, Z., *ArrayFire Benchmark Suite*. Atlanta, GA, 2016.

Yalamanchili, P., Arshad, U., Mohammed, Z., Garigipati, P., Entschev, P., **Kloppenborg, B.**, Malcolm, J., Melonakos, J., *ArrayFire - A high performance software library for parallel computing with an easy-to-use API*. Atlanta, GA, 2015.

Kloppenborg, B., Baron, F., *LibOI: The OpenCL Interferometry Library*. Denver, CO, 2012.

Kloppenborg, B., Baron, F., *OIFITS-SIM: The OIFITS-SIMulator*. Denver, CO, 2012.

Kloppenborg, B., Baron, F., *SIMTOI: SImulation and Modeling Tool for Opitcal Interferometry*. Denver, CO, 2012.

Kloppenborg, B. *SSP4 Control Software*. Hastings, NE, 2011.

Kloppenborg, B. *Spectra Cyber Control Software*. Hastings, NE, 2006.

Popular Press Articles

Kloppenborg, B., Pearson, T., Eggenstein, H. B., "Photometry for all in the Digitial Age". In: *Sky & Telescope* (Apr. 2011), pp. 64–66.

Pearson, T., **Kloppenborg, B.**, Eggenstein, H. B., "Measuring Star Brightness with a Digital Camera". In: *The Classroom Astronomer* (2011), pp. 3–7.