

## WAQAS A. BHATTI

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### Education

<i>Undergraduate Institution</i>	<i>Major</i>	<i>Degree</i>
University of California, Los Angeles, CA (UCLA)	Physics	BS, 2005
<i>Graduate Institution</i>	<i>Major</i>	<i>Degree</i>
Johns Hopkins University Baltimore, MD (JHU)	Astrophysics	PhD, 2012

### Research Interests

Engineering of data extraction, analysis, and archiving infrastructure for large astronomical surveys; Stellar populations in the Galaxy; Time domain astronomy; Variable stars; Eclipsing binaries; Low mass stars

### Employment

- 2015 Sep–: Associate Research Scholar,  
*Dept. of Astrophysical Sciences, Princeton University*
  - ▷ Developing [astrobases](#), a Python package to analyze large light curve collections, filter and browse them interactively, and search for and characterize stellar variability
  - ▷ Developing the [HAT Data Server](#), a portal for all publicly released HAT light curve data; this will include browser-based interactive tools to search, filter and analyze these data, as well as comprehensive API access
  - ▷ Developing the [photometry pipeline](#), computing infrastructure, and testing prototype instrument components for the [HATPI](#) survey
  - ▷ Manage HAT data processing and computing infrastructure, including: hardware purchasing and maintenance, photometry pipeline maintenance, network improvements, monitoring, and backups for the [HATNet](#), [HATSouth](#), [HATPI](#), and [CHAT](#) projects
- 2012–2015 Aug: Postdoctoral Research Associate,  
*Dept. of Astrophysical Sciences, Princeton University*
  - ▷ Developed and maintain websites for the [HATNet](#) and [HATSouth](#) surveys, including curating discovery and follow-up data made publicly available for exoplanets found by these two surveys
  - ▷ Reductions to light curves for HATNet transiting exoplanet candidate follow-up photometry from the FLWO 1.2-m telescope and KeplerCam
  - ▷ Developed and maintain [HAT remotecontrol](#) — a real-time monitoring and control interface for HATNet and HATsouth telescopes

- 2006–2012: Graduate Research Assistant,  
*Dept. of Physics & Astronomy, Johns Hopkins University*
  - ▷ [As Part 2 of PhD thesis](#), led project to identify M dwarf eclipsing binaries in SDSS Stripe 82 and characterize their discrepancies with predictions from stellar models
  - ▷ [As Part 1 of PhD thesis](#), led project to improve upon SDSS Stripe 82 photometric precision, then detect and classify variables and periodic variables from these sparsely sample time-series data
- 2005–2006: Graduate Teaching Assistant,  
*Dept. of Physics & Astronomy, Johns Hopkins University*
  - ▷ Taught discussion sections for 171.101 (General Physics for Physical Science Majors I — Fall 2005) and 171.102 (General Physics for Physical Science Majors II — Spring 2006)
  - ▷ Led laboratory sessions for 173.111 (Lab for General Physics for Physical Science Majors I — Fall 2005) and 173.112 (Lab for General Physics for Physical Science Majors II — Spring 2006)
  - ▷ Tutored undergraduate students for General Physics courses 171.101 and 171.102 (for physical science majors), 171.103 and 171.104 (for biological science majors)

## Service

Peer reviewer for the AAS Astronomical Journal (2016–2017); Undergraduate research advisor (Princeton Planets and Life Certificate Program — Spring 2015); Developer and maintainer of the [Princeton Astro-coffee](#) website for arXiv article discussion with voting (2014–to date); NASA Kepler K2 Guest Observer Program Cycle 1 peer review panelist (2014); Exhibit presenter and volunteer, Princeton University Science and Engineering EXPO (2013); Exhibit presenter and volunteer, Johns Hopkins University Science Fair (2006–2010)

## Technical Skills

- **Astronomy** — IDL, IRAF, photometric and spectroscopic reduction pipelines
- **Programming (Python)** — scientific (NumPy, SciPy, Matplotlib, astropy, scikit-learn, Cython), web (Tornado, Django), and databases (psycopg2, cassandra-driver)
- **Programming (other)** — basic C and C++
- **Databases** — general SQL and schema design, SQLite3, PostgreSQL, MySQL/MariaDB (& Galera Cluster), Cassandra
- **Web** — HTML, Javascript, CSS, basic web design & frameworks (Foundation, Bootstrap)
- **Other** — shell scripting, Linux system administration (hardware, config management, networks)

See [Github](#) for public code and [my website](#) for everything else.

## Observing Experience

Apache Point Observatory 3.5-m telescope (SPICAM, NICFPS, DIS, ARCES — 40 half nights in 2007-2011); Kitt Peak National Observatory 2.1-m telescope (T2KB imager — 14 nights in 2009B and 2011B)

## Awards

Kerr Graduate Fellowship (JHU; 2005–2006); Undergraduate Research Program Scholarship (UCLA; 2004–2005)

## Graduate and Postdoctoral Advisors

Ford, H. C. (JHU, PhD advisor); Bakos, G. Á. (Princeton, Postdoctoral advisor)

## Selected Refereed Publications

- Hartman, J. D., Bakos, G. Á., **Bhatti, W.**, et al. 2016, “*HAT-P-65b and HAT-P-66b: Two Transiting Inflated Hot Jupiters and Observational Evidence for the Re-inflation of Close-in Giant Planets*”, *Astronomical Journal*, **accepted**, [arXiv:1607.02767](#)
- **Bhatti, W.**, Bakos, G. Á., Hartman, J. D., et al. 2016, “*HATS-19b, HATS-20b, HATS-21b: Three Transiting Hot-Saturns Discovered by the HATSouth Survey*”, *Astronomical Journal*, **submitted**, [arXiv:1607.00322](#)
- Huang, C. X., Penev, K., Hartman, J. D., Bakos, G. Á., **Bhatti, W.**, et al. 2015, “*High-precision photometry for K2 Campaign 1*”, *Monthly Notices of the Royal Astronomical Society*, **454**, 4159, [arXiv:1507.07578](#)
- Hartman, J. D., **Bhatti, W.**, Bakos, G. Á., et al. 2015, “*HAT-P-50b, HAT-P-51b, HAT-P-52b, and HAT-P-53b: Three Transiting Hot Jupiters and a Transiting Hot Saturn From the HATNet Survey*”, *Astronomical Journal*, **150**, 168, [arXiv:1503.04149](#)
- Bakos, G. Á., Hartman, J. D., **Bhatti, W.**, et al. 2015, “*HAT-P-54b: A Hot Jupiter Transiting a 0.6  $M_{\odot}$  Star in Field 0 of the K2 Mission*”, *Astronomical Journal*, **149**, 149, [arXiv:1404.4417](#)
- **Bhatti, W. A.**, Richmond, M. W., Ford, H. C., & Petro, L. D. 2010, “*Variable Point Sources in Sloan Digital Sky Survey Stripe 82. I. Project Description and Initial Catalog (0 hr  $\leq \alpha \leq 4$  hr)*”, *Astrophysical Journal Supplement Series*, **186**, 233, [arXiv:0912.0976](#)

## Selected Other Publications

- **Bhatti, W. A.**, Richmond, M. W., Ford, H. C., & Petro, L. D. 2011, “*Low Mass Eclipsing Binaries in SDSS Stripe 82*”, *16th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun*, **448**, 795
- Ford, H. C., **Bhatti, W.**, Hebb, L., Petro, L., Richmond, M., & Rogers, J. 2008, “*Detecting Transits in Sparsely Sampled Surveys*”, *American Institute of Physics Conference Series*, **1082**, 275, [arXiv:0903.1285](#)

**For all publications and citations:** see [NASA’s Astrophysical Data System \(ADS\)](#), the [arXiv](#), or the [list on my website](#).