Vishal Pramod Kasliwal

Department of Physics & Astronomy
University of Pennsylvania
209 S. 33rd St.
Philadelphia, PA 19104-6396
Nationality: Indian
Languages Spoken: English & Hindi

Phone: 267.206.9287
Email: vishal.kasliwal@gmail.com
Alt: vish@sas.upenn.edu

EMPLOYMENT

Postdoctoral Fellow in LSST Data Management & Galaxy Surveys (*Sept. 2015 - present*)

Univ. of Pennsylvania, Dept. of Physics & Astronomy
Princeton Univ., Dept. of Astrophysical Sciences
Supervisors: Dr. Robert Lupton, Dr. Bhuvnesh Jain, & Dr. Mike Jarvis

My postdoctoral duties are split between my responsibilities as an algorithms and software developer on the software stack for the Large Synoptic Survey Telescope (LSST) with the Princeton LSST Data Management group and my research on the analysis of stochastic light curves from accretion flows around binary supermassive black-holes at UPenn. At Princeton, I have made functionality and bug-fix contributions to the LSST software stack and have researched image-analysis problems including differential chromatic refraction & optimal image stacking. At UPenn, I have developed and implemented an algorithm to identify potential binary supermassive black hole candidates from their light-curves (i.e. brightness as a function of time). Details may be found in my software library - KĀLĪ.

EDUCATION

Drexel University *September 2015*
Ph.D. in Physics
Thesis: *Probing AGN Accretion Physics through AGN Variability: Insights from Kepler*
Advisors: Dr. Michael S. Vogeley & Dr. Gordon T. Richards

Virginia Commonwealth University *May 2007*
M.S. in Physics & Applied Physics
Thesis: *CAFM Studies of Epitaxial Lateral Overgrowth GaN Films*
Advisor: Dr. Alison A. Baski

University of Richmond *May 2005*
B.A. in Mathematics & Physics
Thesis: *The Bispectrum as a Quantifier of non-Gaussianity in the Cosmic Microwave Background*
Advisor: Dr. Emory F. Bunn

COMPUTING

- Proficient in C++, Python & Cython for
    1. scientific computing, statistics & statistical modeling, pattern recognition, data science, data analysis, data modeling, analytics, machine learning.

2. code optimization including parallel computing with OpenMP, Intel Cilk Plus, and the Python Multiprocessing module.
3. programming Intel Xeon Phi accelerator cards using Intel LEO extensions & OpenMp 4.0 in C++.
4. generating hardware random numbers using Intel Bull Mountain technology.
5. creating frameworks for scientific analysis using design patterns & object-oriented design principles.
6. algorithm development with Intel Math Kernel Library, Intel Data Analytics Library, scipy, numpy, & scikit-learn.
7. unit-testing with py.test and C++ Boost UTF.

- 1 year of experience developing LSST Stack software in a collaborative professional environment with regular usage of standard development tools and techniques for agile development, continuous integration, and version control. Tools used include Atlassian JIRA, Jenkins, and Git.
- Principle developer of C++, Python, & Cython library KĀLĪ for light-curve analysis using stochastic models including Continuous-time Autoregressive-Moving Average (C-ARMA) & modulated C-ARMA processes.
- 12+ years of experience with Linux, LaTeX, Mathematica, and MS Windows & 7 years of experience with Mac OS X for programming and development.
- Experience with IDL, bash, SQL, R, Intel CompilerXE toolchain, gcc toolchain, MATLAB, LONCAPA, Photoshop and Office Suites including MS Office, OpenOffice & LibreOffice.

PUBLICATIONS

- "Science-driven Optimization of the LSST Observing Strategy", GitHub Repository, 2016
- "Extracting Information from AGN Variability", *submitted to MNRAS*, 2016
- "The LSST Data Management System", Proceedings of ADASS XXV, 2015
- "Do the Kepler AGN light curves need reprocessing?", MNRAS, 453, 2075, 2015
- "Are the variability properties of the Kepler AGN light curves consistent with a damped random walk?", MNRAS, 451, 4328, 2015
- "Thirty Meter Telescope Detailed Science Case: 2015", http://arxiv.org/abs/1505.01195, 2015
- "AFM and CAFM studies of ELO GaN films", Proc. SPIE 6473, 647308, 2007
- "Local electronic and optical behaviors of a-plane GaN grown via epitaxial lateral overgrowrth", Appl. Phys. Lett., 90, 011913, 2007

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

- American Astronomical Society (AAS)
- Large Synoptic Survey Telescope (LSST) Data Management (DM)
- Thirty Meter Telescope (TMT) International Science Development Team (ISDT): Time Domain Science
- Thirty Meter Telescope (TMT) International Science Development Team (ISDT): Supermassive Black Holes
- LSST Galaxies Collaboration
- ΣΠΣ Drexel University, Philadelphia, PA.
- ΣΠΣ Virginia Commonwealth University, Richmond, VA.

CONFERENCE & MEETING PARTICIPATION

- Participated in the LSST 2016 Project & Community Workshop, August 2016, Tuscon, AZ
- Presented *Probing Accretion Processes through Variability* at the 2016 TMT Science Forum 'International Partnership for Global Astronomy', May 2016, Kyoto, Japan.
- Presented *AGN Variability: Insights from Kepler* in the Princeton HSC Science Discussion Series, March 2016, Princeton, NJ.
- Presented *AGN Variability on Short Timescales: What does Kepler tell us about AGN Variability?* at the 2015 TMT Science Forum 'Maximizing Transformative Science with TMT', June 2015, Washington, DC.
- Presented *What can Kepler tell us about AGN variability?* at the 225th Meeting of the American Astronomical Society, January 2015, Seattle, WA.
- Presented *Do Kepler AGN Light Curves Exhibit a Damped Random Walk?* at the 224th Meeting of the American Astronomical Society, June 2014, Boston, MA.
- Participated in the SciCoder Workshop, June 2010, New York, NY
- Attended the 215th Meeting of the American Astronomical Society, Jan. 2010, Washington, DC.
- Participated in the NSF-PIRE Summer School: Lensing of the CMB and High-z Galaxies, July. 2009, Philadelphia, PA.
- Presented *The Bispectrum of Galactic Dust: Implications for Microwave Background non-Gaussianity* at the 204th Meeting of the American Astronomical Society, May 2004, Denver, CO.

GRANTS, OBSERVING PROPOSALS & AWARDS

- K2 GO8052 & K2 GO10052 Observing Campaigns (with Dr. G. T. Richards as PI), University of Pennsylvania, 2016
- NASA grant NNX14AL56G (with Dr. M. S. Vogeley as PI), Drexel University, 2014 - 2017.
- Jackson J. Taylor Best Senior Seminar in Physics Award, University of Richmond, 2005.
- Marsh White Award for the Outstanding Undergraduate Paper at the Society of Physics Students Undergraduate Research Session, Southeastern Section of the American Physical Society, 2003.
- National level participant in the Mathematics Training and Talent Search Programme (I.I.T., Mumbai), 2002.
- National level participant in the 2nd Indian Astronomy Olympiad, I.S.R.O., 2000.

SERVICE & OUTREACH

- Regular reviewer for *The Astrophysical Journal*
- Started the *The Sky in the City* astronomy night program at the Dornsife Center (Drexel University). Responsiblities include running the program for the Drexel Physics Department and acquisition of telescopes to support the event.
  May 2015 - *present*
- Volunteer at the Drexel University Lynch Observatory for telescope open houses. Responsibilities include setting up, operating, and storage of the department's telescopes.
  Sept. 2008 - *present*
- Organized and co-taught the "Fun Physics" lectures at Drexel University Department of Physics. Topics included General Relativity, Advanced Mathematical Physics, & Spinor Physics.
  Fall 2008 - Fall 2009

PREVIOUS EMPLOYMENT

- Graduate Research Assistant (*April 2014 - Sept. 2015*)
- Graduate Teaching Assistant (*Sept. 2008 - March 2014*)
- Adjunct Instructor (*June 2007 - June 2008*)
- Graduate Teaching Assistant (*Aug. 2005 - May 2007*)
- Research Assistant (*May 2003 - May 2005*)
- Computing Lab Assistant (*Jan. 2002 - May 2005*)

REFERENCES

- Dr. Michael S. Vogeley
  Director of Graduate Studies; Professor

  Dept. of Physics
  Drexel Univ.
  3141 Chestnut Street
  Philadelphia, PA 19104

  Phone: (215)895-2710
  Email: vogeley@drexel.edu

- Dr. Gordon T. Richards
  Associate Professor

  Dept. of Physics
  Drexel Univ.
  3141 Chestnut Street
  Philadelphia, PA 19104

  Phone: (215)895-2713
  Email: gtr@physics.drexel.edu

- Dr. Stephen L.W. McMillan
  Interim Department Head; Professor

  Dept. of Physics
  Drexel Univ.
  3141 Chestnut Street
  Philadelphia, PA 19104

  Phone: (215)895-2709
  Email: steve@physics.drexel.edu