Shubham Kanodia

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https://github.com/shbhuk shbhuk@gmail.com

EDUCATION

Pennsylvania State University — **Pennsylvania, USA**
Doctor of Philosophy (Ph.D.) Astrophysics — Sept 2017 - Now

Brown University — **Rhode Island, USA**
Master of Science (Sc.M.) Physics — Sept 2015 - Dec 2016

St. Xavier's College — **Mumbai, India**
Bachelor of Science (B.Sc.) Physics — June 2012 - Apr 2015

FELLOWSHIPS

Zaccheus Daniel Fellowship — **Pennsylvania, USA**
2018, 2020

Homer F. Braddock / Nellie H. and Oscar L. Roberts Fellowship — **Pennsylvania, USA**
Sept 2017 - Aug 2018

J.N. Tata Endowment Fund for Higher Education — **Mumbai, India**
Aug 2015 - Dec 2016

INSPIRE Scholarship - Government of India — **Mumbai, India**
Mar 2013 - Mar 2015

SKILLS

- **Software** - Python, R, LaTeX, IDL, SolidWorks, Java, Zemax, VHDL and Adobe Photoshop
- **Outreach and Social Media** -
  - Volunteered for Astrofest - Penn State Department of Astronomy Annual outreach event (July 2017, 2018, 2019)
  - Volunteered with Brown Cubesat Educational Outreach Saturday STEM program at West Broadway Middle School to communicate Science and Physics to students. (Oct 2015 - Apr 2016)
  - Volunteered at Umang Foundation, Mumbai - teaching underprivileged children basic math and english. (Dec 2012 - Dec 2014)
  - Proficient in use of social networking for creating awareness. Created a group on Facebook post 26th November 2008 Terrorist Attacks in Mumbai, which garnered support from 100,000 members across 60 countries worldwide. We effectively used the membership to make the most accurate, publicly available list of the deceased in the attacks. I was invited by the US Government (Department of State) for a conference of non-profits using social networking to gather support, in 2009 (Alliance of Youth Movements).

PUBLICATIONS

FIRST AUTHOR

- Ghosts of NEID's Past *Proceedings of the SPIE, (2020)* **Shubham Kanodia**, J. P. Ninan, A. J. Monson, Suvrath Mahadevan, Colin Nitroy, Chris Schwab, Samuel Halverson, Chad Bender, ...

- TOI-1728b: The Habitable-zone Planet Finder confirms a warm super Neptune orbiting an M dwarf host
  Astrophysical Journal - Volume 899, Issue 1, article id. 29 (2020). **Shubham Kanodia**, Caleb I. Canas; Gudmundur Stefansson; Joe P. Ninan, ...

- Mass-Radius relationship for M dwarf exoplanets: Comparing nonparametric and parametric methods
  Astrophysical Journal - Volume 882, Issue 1, article id. 38, 14 pp. (2019). **Shubham Kanodia**, Angie Wolfgang, Gudmundur K. Stefansson, Bo Ning, Suvrath Mahadevan.

- Overview of the spectrometer optical fiber feed for the Habitable-zone Planet Finder *Proceedings of the SPIE, Volume 10702 107026Q (2018)* **Shubham Kanodia**, Suvrath Mahadevan, Lawrence. W. Ramsey, Gudmundur K. Stefansson, ...

- Python Leap Second Management and Implementation of Precise Barycentric Correction (barycorrpy)
  Research Notes of the AAS, Volume 2, Issue 1. (2018) **Shubham Kanodia** and Jason Wright

CO-AUTHOR

- A Mini-Neptune and a Venus-Zone Planet in the Radius Valley Orbiting the Nearby M2-dwarf TOI-1266: Validation with the Habitable-zone Planet Finder
  The Astrophysical Journal, Volume 160, Issue 6, id.259 (2020) Gudmundur Stefansson, Ravi Kopparapu, ..., **Shubham Kanodia (as coauthor)**..

- The Habitable-zone Planet Finder Reveals A High Mass and a Low Obliquity for the Young Neptune K2-25b
  The Astronomical Journal, Volume 160, Issue 4, id.192 (2020) Gudmundur Stefansson, Suvrath Mahadevan, Marissa Maney, ..., **Shubham Kanodia (as coauthor)**..

- Barycentric Corrections for Precise Radial Velocity Measurements of Sunlight
  The Planetary Science Journal, Volume 1, Issue 2, id.38 (2020) Jason Wright, and **Shubham Kanodia**

- A warm Jupiter transiting an M dwarf: A TESS single transit event confirmed with the Habitable-zone Planet Finder
  The Astronomical Journal, Volume 160, Issue 3, id.147 (2020) Caleb I. Cañas, Gudmundur Stefansson, **Shubham Kanodia**,...

- Persistent starspot signals on M dwarfs: multi-wavelength Doppler observations with the Habitable-zone Planet Finder and Keck/HIRES
  The Astrophysical Journal, Volume 897, Issue 2, id.125 (2020) Paul Robertson, Gudmundur K. Stefansson, ..., **Shubham Kanodia (as coauthor)**..

- Evidence for He I 10830 Å Absorption during the Transit of a Warm Neptune around the M-dwarf GJ 3470 with the Habitable-zone Planet Finder
  The Astrophysical Journal, Volume 894, Issue 2, id.97. (2020) J.P. Ninan, Gudmundur K. Stefansson, ..., **Shubham Kanodia (as coauthor)**..

- Solar Contamination in Extreme-precision Radial-velocity Measurements: Deleterious Effects and Prospects for Mitigation
  The Astronomical Journal, Volume 159, Issue 4, id.161. (2020) Arpita Roy, Sam Halverson, ..., **Shubham Kanodia (as coauthor)**..

- A Sub-Neptune-sized Planet Transiting the M2.5 Dwarf G 9-40: Validation with the Habitable-zone

Planet Finder
The Astronomical Journal, Volume 159, Issue 3, id.100. (2020) Gudmundur K. Stefansson, Caleb Canas, ..., **Shubham Kanodia (as coauthor)**..

- Ultra-Stable Environment Control for the NEID Spectrometer: Design and Performance Demonstration
Journal of Astronomical Telescopes, Instruments, and Systems - Volume 5, id. 015003. (2019) Robertson, Paul; Anderson, Tyler; Gudmundur Stefansson, ..., **Shubham Kanodia (as coauthor).**
- Stellar Spectroscopy in the Near-infrared with a Laser Frequency Comb
Optica Volume 6, Issue 2, pp. 233-239 (2019) Andrew J. Metcalf, Tyler Anderson, Chad F. Bender, ..., **Shubham Kanodia (as coauthor).**
- How Much SETI Has Been Done? Finding Needles in the n-dimensional Cosmic Haystack *The Astronomical Journal, Volume 156, Issue 6, article id. 260, 13 pp. (2018)* Jason Wright, **Shubham Kanodia** and Emily Lubar
- NASA and the Search for Technosignatures: A Report from the NASA Technosignatures Workshop
NASA Technosignatures Workshop Participants. Edited by Dawn Gelino and Jason Wright; Chapter Leads: Natalie Batalha, Svetlana Berdyugina, Emilio Enriquez, **Shubham Kanodia**, Andrew Siemion, Jason Wright, Shelley Wright.
- The Habitable-Zone Planet Finder: improved flux image generation algorithms for H2RG up-the-ramp data *Proceedings of the SPIE, Volume 10709 107092U (2018)* J. P. Ninan, Chad F. Bender, ..., **Shubham Kanodia (as coauthor)**
- Toward Space-like Photometric Precision from the Ground with Beam-shaping Diffusers *The Astrophysical Journal, Volume 848, Number 1. (2017)* Gudmundur Stefansson, Suvrath Mahadevan, ..., **Shubham Kanodia (as coauthor)**..

POSTER PRESENTATIONS

- **NEID Fiber feed and barycentric correction system** — **Grindelwald, Switzerland**
  Extreme Precision Radial Velocity IV — March 2019
- **Overview of the spectrometer optical fiber feed for HPF** — **Austin, USA**
  SPIE Astronomical Telescopes and Instrumentation 2018 — June 2018

PROFESSIONAL TALKS

Next-gen RV instrumentation and M-R relationships — **State College, USA**
Department Lunch Talk — February 2019

Placing Limits in Radio SETI: The Cosmic Haystack — **Houston, USA**
NASA Technosignatures Workshop, USRA — September 2018

Ultra-Stable Input Light for Ultra-Stable Spectrometers: Fiber-train for HPF and NEID — **USA**
Emerging Researchers in Exoplanet Science symposium (ERES IV), PSU — June 2018

Optical Design for EXoplanet Climate Infrared TElescope (EXCITE) — **State College, USA**
Department Lunch Talk — September 2017

PUBLIC TALKS

Digging through the Cosmic Haystack — **State College, USA**
Astronomy on Tap: State College — October 2019

Searching for other worlds, other life — **State College, USA**

Nerd Nite: Webster's Cafe — June 2019

Finding Earth 2.0 — **Mumbai, India**
Nehru Planetarium — Jan 2018

ACADEMIC SERVICE

Referee
International Journal of Astrobiology

Science Organizing Committee
Emerging Researchers in Exoplanet Sciences IV — June 2018

CO-CURRICULAR ACTIVITIES AND RESEARCH PROJECTS

HPF and NEID spectrograph design and instrument assembly — **Pennsylvania, USA**
Pennsylvania State University — Jan 2017 - Aug 2017
The Habitable Planet Finder (HPF) and NEID are high precision spectrographs for Radial Velocity measurements of exoplanets in NIR and optical respectively. My work involves optical design, simulation and analysis, along with assistance in the assembly and testing of the instrument.(Prof. Suvrath Mahadevan)

Optical design for exoplanet telescope (EXCITE) in Zemax — **Rhode Island, USA**
Brown University — April 2016 - Dec 2016
Master's Thesis - Optical Design and Simulation for EXoplanet Climate Infrared Telescope (EXCITE). Zemax designing includes non-sequential ray tracing to optimize positions, specifications and design of the various optical components of the setup. (Prof. Gregory Tucker)

Muon detection and rate measurement — **Mumbai, India**
St. Xavier's College — Jan 2015
(Undergraduate Semester Project) Performed using a plastic scintillator coupled to photomultiplier tubes, discriminator and then counted using coincidence logic. (Prof. Kajari Mazumdar and Mrs. Mandakini Patil, TIFR, India)

Optical Simulation of Quantum logic — **Mumbai, India**
St. Xavier's College — Sept 2014
(Undergraduate Semester Project) Polarizing photons using a sugar solution in order to simulate qubits and their superposition. (Prof. J.B. Mistry)

Diffuse UV background radiation — **Bangalore, India**
Indian Institute of Astrophysics (IIA) — Apr 2014 - May 2014
Worked on Galex spacecraft data to analyze diffuse background UV radiation scattering due to interstellar dust, particularly at high northern galactic latitudes. (Prof. Jayant Murthy)

FPGA programming — **Mumbai, India**
Tata Institute of Fundamental Research (TIFR) — Oct 2013 - Nov 2013
Worked on FPGA programming in a Altera FPGA board using VHDL for basic digital logic functions for use in detectors in High Energy Particle Physics. (Prof. Kajari Mazumdar and Mandakini Patil)

Alpha tagged Calibration for CZT-I in ASTROSAT — **Mumbai, India**
Tata Institute of Fundamental Research (TIFR) — May 2013 - June 2013
Analyzing timing parameters for efficient calibration of CZT-I hard X-ray detector using Alpha particle source for the space telescope ASTROSAT. (Prof. A.R.Rao)

Recreation of Millikan's oil drop experiment — **Mumbai, India**
St. Xavier's College — May 2013 - June 2013
Recreating Millikan's oil drop experiment and obtaining the charge on an electron using a hard bristle toothbrush for an atomizer. (Prof. J.B. Mistry)

Starting the Physics Circle — **Mumbai, India**
St. Xavier's College — Nov 2012 - Dec 2014

The Physics Circle was started as a forum for students to discuss concepts and new ideas. Students gave presentations, apart from which there were public lectures by distinguished speakers.

TEACHING

Teaching Assistant for Astronomy lab **Providence, USA**
Brown University Jan 2016 - Apr 2016
Lab assistant for basic astronomy labs, eg. measuring blue shift of Andromeda, CCD imaging etc. (Prof. Ian Dell'Antonio)

MENTORING

Helen Baran
Now a graduate student at Paris Observatory

Marissa Maney
Now a graduate student at Harvard University

Brody McElwain
Undergraduate student in Engineering Science at Pennsylvania State University

EXTRA - CURRICULAR ACTIVITIES

- Officer in Charge for Public Lectures, Paradigm 2015, St. Xavier's College Science Festival
- Design Head and Editor for 'Celeritas', St. Xavier's College Physics Magazine
- Part of Debsoc, St. Xavier's College Debating society