Isaac Shivvers

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I'm a data-driven scientist with a background in observational astrophysics, and I'm looking to apply my skills to a new set of challenges. Self-directed and deeply engaged, I have a proven track record in computationally-driven scientific research utilizing machine learning and statistical models, and I'm an experienced communicator of complex processes to non-technical audiences.

ishivvers.com
github.com/ishivvers
linkedin.com/in/ishivvers

Ph.D. UC Berkeley, Astrophysics, Spring 2017

- **Wrote 4 peer-reviewed articles as lead author** (2 more in progress) exploring the diversity of supernova explosions arising from the deaths of massive stars. Some of these projects investigated individual supernovae in depth and some analyzed the statistical properties of supernova populations.
- **Assisted as co-author on 15+ peer-reviewed articles**, and led or assisted with 40+ conference proceedings and minor publications (not peer-reviewed).
- **Presented my work at 5+ international astrophysics conferences** in the United States and abroad, and to audiences of astrophysicists at Berkeley numerous times. I've also presented to audiences of students, amateur enthusiasts, or potential donors at multiple events throughout the Bay Area.
- **Led or assisted with 10+ successful proposals** for the use of the Hubble Space Telescope, the 10m telescopes at Keck Observatory, and the 3m telescope at Lick Observatory, among others.
- **Conducted research** under the mentorship of Prof. Alex Filippenko, utilizing complex custom-built instruments to obtain data on distant supernovae. I managed archival datasets and I compared those archives (along with my new observations) to theory and to detailed computational models. I often handled data from its creation at the telescope throughout the data reduction and curation process all the way to archival data storage and interpretation of the results.
- **Managed and maintained group computational resources**, including two Linux servers that house several terabytes of data archives in multiple formats on RAID arrays and run both a suite of public-facing websites and a group wiki.
- **Managed a team of observers and data handlers** for long-term group projects. For 2 years I ran a group of staff researchers and students, orchestrating the myriad tasks required for data collection using the 3m telescope at Lick Observatory.
- **Mentored several students**, both undergraduates and younger graduate students, training them in the technical skills of the field and in the scientific endeavor.

M.A. UC Berkeley, Astrophysics, Spring 2013

- **Wrote a peer-reviewed article as lead author** presenting my master's project with Prof. Josh Bloom, analyzing a rare population of binary stars discovered via a supervised random forest classifier.
- **Led classes and laboratory sessions as a teaching assistant**:
  Python Computing for Data Scientists *(Prof. Josh Bloom; graduate course)*
  Intro to General Astronomy *(Prof. Marc Davis; undergraduate course)*
  Python Bootcamp *(Prof. Josh Bloom; 3-day bootcamp for all levels of researchers)*

B.A. Harvard, Astrophysics, Spring 2011

- **Graduated Cum Laude** with a minor in Earth & Planetary Sciences.
- **Wrote a peer-reviewed article as lead author** presenting my junior thesis with Prof. Edo Berger, a statistical analysis of a sample of gamma-ray bursts.
- **Built, deployed, and tested a robotic atmospheric monitor telescope** with Prof. Chris Stubbs, leading to co-authorship on a peer-reviewed article.
- **Led laboratory sessions as a teaching assistant** for 3 semesters:
  Laboratory Electronics for Physicists *(Prof. Paul Horowitz, undergraduate course)*

Work Examples

- **My published research articles** are available from my website and my LinkedIn (see above).
- **The Berkeley Supernova Database:** I built and then maintained the SNDB, which is used to explore data internally and to share public data releases. See it at `heracles.astro.berkeley.edu/sndb/`
- **Web-based public outreach**, sharing scientific progress with diverse audiences online. Viewable at `ishivvers.com/maps`
- **Code examples:** see my github page.

Skills

- **Machine Learning:** supervised and unsupervised clustering and classification, regression, feature reduction
- **Python:** scientific computing, data visualization, webapps, data management, scikit-learn, numpy
- **High-performance computing:** use of queue-scheduled clusters; parallelization across CPUs, GPUs, and FPGAs
- **Large datasets**: MySQL, PostgreSQL, MongoDB
- **UNIX/Linux:** use, administration, maintainance
- **Computing hardware:** my background includes everything from teaching a course in analog electronics to the design and use of custom-built robotic scientific instruments
- **Writing and presentation:** sharing results and discussing ideas about technical topics with both expert and lay audiences
- **Project management:** I've run several complex, long-term research projects involving international and cross-disciplinary collaborators, with published results
- **Self management:** as an independently-minded graduate student I defined and executed my own research programs
- **Teaching and mentoring:** 8 years of experience at Harvard and Berkeley as an instructor in technical fields

Honors, Awards & Fellowships

- Berkeley Graduate Division Conference Travel Awards, 2014 & 2016
- Americal Astronomical Society Int'l Travel Award, 2014
- Anselmo J. Macchi Fellowship Fund, 2013
- Nat'l Science Foundation Graduate Research Fellowship Honorable Mention, 2013
- Harvard University PRISE Fellow, 2010
- Harvard College Research Program Fellow, 2009
- National Merit Scholar, 2006-2010
- National AP Scholar, 2006