

# R. Ali Vanderveld

---

1450 North Wood Street, Chicago, IL 60622  
alivanderveld.com

626-421-9860  
ali.vanderveld@gmail.com

---

## SUMMARY

PhD astrophysicist turned data scientist with extensive experience in exploiting large and messy datasets to model complex systems and produce actionable insights. Strong background in problem solving, model building, mathematics, statistics and error analysis, programming, and communication.

## PROFESSIONAL EXPERIENCE

**Senior Data Scientist at Groupon** 2013 - present

- Built and deployed a novel Customer Lifetime Value reporting system that scores hundreds of millions of customers on a daily cadence, using SQL, R, and Hadoop
- Forecasting demand and prioritizing merchant acquisition by modeling user purchase patterns and interactions with the website, using SQL, R, and Python
- Developed a streaming A/B experiment status reporting system using Storm in Clojure
- Sales process analytics and monitoring in Tableau

**Postdoctoral Fellow at the University of Chicago** 2010 - 2013

- Led a study to quantify the effects of lossy data compression on observations of galaxy shapes using an IDL image simulation pipeline
- Used a Fortran Markov-Chain Monte Carlo parameter estimation code to predict future gravitational lensing observations from current state-of-the-art cosmological datasets
- Computed gravitational lensing observables in the context of alternative gravity theories
- Co-wrote a winning \$40M proposal to work on the European space telescope mission *Euclid*
- Chaired the committee that organizes the institute lunchtime seminar series
- Participated in the “Astronomy Conversations” program at the Adler Planetarium

**Postdoctoral Scholar at Caltech and NASA Jet Propulsion Laboratory** 2007 - 2010

- Co-developed and tested a realistic astronomical image simulation pipeline based on data from the *Hubble Space Telescope*
- Adapted this pipeline to simulate the balloon-borne High Altitude Lensing Observatory mission by modeling upper-atmosphere emission data
- Computed the effects of cosmic voids on cosmological distance measurements with a Monte-Carlo analysis in Mathematica
- Used data from the large-scale Millennium Simulation to perform mock supernova surveys to determine the uncertainty on cosmological distance measurements due to the Döppler Effect
- Supervised two student research assistants on projects related to weak gravitational lensing data analysis

**Research assistant at Cornell University** 2001 - 2007

- Wrote and utilized a simulation in C of the formation of black holes from self-annihilating dark matter particles
- Numerically calculated distance observables in inhomogeneous cosmological models

- Computed the perihelion precession of Mercury for general scalar-field dark energy models
- Co-organized the Tenth Eastern Gravity Meeting

**Mechanical design engineer at Pratt and Whitney Aircraft Engines** 2001

- Designed jet engine test facilities, including an instrument heat shield and probe adapters
- Worked in the hail ingestion testing lab

**Research assistant the University of Illinois at Urbana-Champaign** 1999 - 2001

- Used a simulation of ferromagnets to explore the effects of magnetization history on magnetic hysteresis “memory,” to improve hard drive efficiency

## EDUCATION

**Ph.D. Physics**, Cornell University, Ithaca, NY August 2007  
Thesis in theoretical cosmology

**M.S. Physics**, Cornell University, Ithaca, NY May 2005

**B.S. Physics**, University of Illinois Honors Program, Urbana-Champaign, IL May 2001

## RELEVANT TECHNICAL SKILLS

**Academic expertise:** Cosmology and astrophysics

**Programming experience:** Python, SQL, R, C, Mathematica, LaTeX, perl, IDL, Clojure, Fortran

**Scientific experience:** Machine learning, numerical mathematical methods, modeling of complex systems, data and error analysis, Bayesian methods, Monte-Carlo simulation, data visualization, image processing, scientific writing and communication

## PUBLICATIONS

Author of 16 publications, 10 of which are first- or sole-authored, in top peer-reviewed scientific journals including **Physical Review Letters**, **The Physical Review**, **The Astrophysical Journal**, **Astroparticle Physics**, and others.

## SELECTED AWARDS AND HONORS

Selected for Groupon’s Early Career Talent Program 2015

Kavli Institute for Cosmological Physics Postdoctoral Fellowship 2010

AAUW American Dissertation Fellowship 2006

Cornell NASA Space Grant Fellowships 2001, 2005

National Science Foundation Graduate Research Fellowship 2001-2004

GE Faculty of the Future Award 2001

UIUC Excellence in Teaching Awards 2000, 2001

Lorella Jones Fellowship: UIUC outstanding undergraduate research 2000

James Newton Matthews Scholarship 1998-2001