

# Vanessa Martina Böhm

Physicist and Cosmologist with 6 years of experience solving statistical, numerical and theoretical problems seeking to apply her skills to earthbound problems.

## SELECTED WORKS

### Probabilistic Auto-Encoder

This deep generative model produces state-of-the-art results in sample quality and outlier detection accuracy. [\[1\]](#)

### DEEPUQ- Deep Bayesian Uncertainty Quantification

This framework exploits neural network based generative models for solving Bayesian inverse problems in high dimensions [\[2\]](#) (Accepted for publication at the NeurIPS 2019 BDL Workshop)

## WORK EXPERIENCE

### Postdoctoral Fellow - Physics Department, UC Berkeley

Nov 2017 - PRESENT

- ❑ developed machine learning algorithms for statistical data analysis including outlier detection and high dimensional posterior analysis
- ❑ applied ML models in various data analysis projects
  - ❑ estimating COVID-19 fatality rates
  - ❑ uncovering COVID-related trends in applications for the CA food stamp program
- ❑ advanced differentiable simulation codes for cosmological data analysis
- ❑ derived theory for modeling systematics in cosmological data

### PhD Candidate - Max-Planck Institute for Astrophysics ([MPA](#))

Oct 2013 - Oct 2017

- ❑ solved Bayesian inverse problems in cosmology
- ❑ developed methods for extracting non-Gaussian information from cosmological observables

## EDUCATION AND DEGREES

### PhD - Ludwig-Maximilian University (LMU), Munich, Germany

graduated *summa cum laude*

### Master of Science (Physics)- Heidelberg University, Germany

Graduation with 1.0 (4.0 in the US system [\[3\]](#))

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## Computational Skills

- ❑ Python, C++, PyStan
- ❑ tensorflow, keras, scikit-learn
- ❑ pandas, dask, mpi4py
- ❑ git, anaconda, bash

## EXPERTISES

### (Deep) Learning

- ❑ generative models
- ❑ regression
- ❑ classification
- ❑ outlier detection
- ❑ clustering analysis

### Bayesian Statistics

- ❑ inverse problems
- ❑ optimization
- ❑ sampling algorithms

### N-body Simulations

- ❑ code development
- ❑ data analysis

## LANGUAGES

German - native

English - fluent

## FELLOWSHIPS

Scholar of the German Academic Exchange Service [\[DAAD\]](#), Aug 2012-May 2013

## OUTREACH & VOLUNTEERING

Judge for [Jugend Forscht] (2014-2017)

Student mentor in the [Heidelberg Life-Science Lab] (2008-2013)

