# Dr. Pushkar Kopparla

## Skills

- Scientific python (numpy, matplotlib, pandas), including geoscience librares (rasterio, xarray, geopandas, folium), GDAL, PostgreSQL/PostGIS, QGIS
- Git, Docker, Slurm, Amazon Web Services including CLI, Google Earth Engine
- Scientific writing and presentation, remote sensing data analysis, atmospheric science

## Education

- **PhD in Planetary Science**                                                                         **2013 – 2018**
  California Institute of Technology (Caltech)                                         Pasadena, USA
- **MSc in Atmospheric and Climate Science**                                       **2011 – 2013**
  Eidgenossische Technische Hochschule Zurich (ETH Zurich)        Zurich, Switzerland
- **BTech in Engineering Physics**                                                             **2007 – 2011**
  Indian Institute of Technology Delhi (IIT Delhi)                                  New Delhi, India
- **Certifications:** AWS Developer Associate (Aug 2021), Mastering GDAL Tools (July 2021), Google Earth Engine End-to-End (June 2021)

## Work Experience

**CSH Fellow (Independent Postdoctoral Researcher)**                    **Oct 2020 – Present**
University of Bern                                                                                       Bern, Switzerland

- created data pipelines to execute sequences of climate simulations on a university high performance computing cluster with a total dataset size of several terabytes.
- developed new measures for estimating model errors and published a paper uncovering a wide-ranging issue that affects most exoplanet climate simulation studies in the past decade.
- initiated a modeling effort to link lab-based measurements of light polarization by single leaves to observations of trees and forests from aerial and space-based imagery for eventual use in exoplanet biosignature detection.
- contributed code to open-source geospatial libraries like xarray.

**JSPS Fellow (Independent Postdoctoral Researcher)**                    **Sep 2018 – Sep 2020**
University of Tokyo                                                                                    Tokyo, Japan

- designed data pipelines to download, select, clean, impute and analyze hundreds of satellite images of Venus
- conceptualized an unsupervised machine learning analysis (PCA) to identify patterns in images of atmospheric variability and interpreted them in terms of known atmospheric large-scale circulation.
- proposed an innovative theoretical model that solves a 40-year old problem in the field.
- published 5 peer-reviewed journal papers and gave talks at 4 international conferences.
- led seminars to mentor masters and bachelors level students on scientific talks and paper writing.

**Graduate Research Assistant (PhD Candidate)**                            **Jul 2013 – June 2018**
California Institute of Technology                                                           Pasadena, USA

- developed a fast radiative transfer model that is 100x faster with errors of 0.01% compared to a standard radiative transfer model and was effective in rapid retrievals of greenhouse gases from satellite-based remote sensing.
- collaborated with a team of observational astronomers, including assisting in on-site overnight observing at the Gemini North 8-m telescope, leading to one of the very first successful attempts to estimate reflectivity of an exoplanet using polarized light.
- published research results in 8 peer-reviewed papers and gave talks at 10 international conferences.
- served as teaching assistant to four undergraduate courses, led tutorial sessions and geological field trips, and mentored four summer research students.