

# Jayanti Prasad. Ph.D

## Contact Address

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## ■ Current Interests:

Data Science, Machine Learning, Natural Language Processing, Software Engineering, High Performance Computing, Machine Learning, Teaching and training.

## ■ Research Interests:

Physics, Astrophysics (Cosmology, Radio Astronomy), Artificial Intelligence, Optimization, Modeling and simulation.

## ■ Employment

- **Data Scientist** [July 2018 - Present]  
- *Embold Technologies GmbH, Pune, INDIA*
- **Consultant System Administrator** [July 2016 - June 2018 ]  
- *Inter-University Centre for Astronomy & Astrophysics (IUCAA) Pune, INDIA*
- **DST-SERB Young Scientist** [2015-2016]  
- *Center for Modeling & Simulations (CMS), SPPU, Pune, INDIA*
- **Post-Doc (with Prof. Tarun Souradeep)** [2010 - 2015]  
- *Inter-University Center for Astronomy & Astrophysics (IUCAA), Pune, INDIA*
- **Post-Doc (with Prof. Jayaram Chengalur)** [2008 - 2010]  
- *National Center for Radio Astrophysics (NCRA-TIFR) Pune, INDIA*

## ■ Education

- **Ph.D (with Prof. J. S. Bagla)** [2002 - 2008] in Physics (Astrophysics)  
- *Harish-Chandra Research Institute, Allahabad (UP), INDIA*
- **Diploma In Education (B. Ed)** [1999-2000] (1st Div)  
- *H. N. Bahuguna Garhwal University, Srinagar Garhwal, Uttarakhand, INDIA*
- **M.Sc.** [1996 - 1998] in Physics (Electronics & Communication with, 72.5 %)  
- *H. N. Bahuguna Garhwal University, Srinagar Garhwal, Uttarakhand, INDIA*
- **B.Sc.** [1993 - 1996] (Physics, Mathematics & Chemistry, 62.5 %)  
- *H. N. Bahuguna Garhwal University, Srinagar Garhwal, Uttarakhand, INDIA*
- **Intermediate.** [1991-1993] (Physics, Chemistry & Mathematics, 69 %)  
- *U.P. Board Allahabad, Uttar Pradesh, INDIA*

## ■ Skills

### • Data Science & Machine Learning :-

- Machine learning on source code (with Github data)
- Encoder-Decoder model of Neural Machine Translation (NMT)
- Language Modeling and Natural Language Processing
- Word Embedding
- Deep Learning, LSTM, TreeLSTM, GRU

- ☐ Frameworks - Keras, Tensorflow, PyTorch, scikit-learn
- ☐ NLP Tools - SpaCy, NLTK, Stanford Core NLP
- ☐ Cloud services - amazon aws, Google colab

- **Software :-**

- ☐ Static Analysis
- ☐ Programming Languages & Abstract Syntax Tree
- ☐ Git Version Control System
- ☐ Jira Issue and Project Tracking
- ☐ Elasticsearch
- ☐ MongoDB
- ☐ Docker

- **Programming (1-10 year exp):-**

- ☐ FORTRAN, FORTRAN 90, C, C++, Python, Java
- ☐ Parallel programming with MPI, OpenMP and CUDA
- ☐ Web development with HTML, CSS, PHP, JavaScript, MySql
- ☐ Scientific Computing with MATLAB, MATHEMATICA
- ☐ Python - iPython, Jupyter, Scipy, Numpy, Pandas, regex
- ☐ Scripting with Bash, Sed, Awk, grep
- ☐ LAPACK, BLAS, CFITSIO, GSL, HDF
- ☐ Documentation & Presentation with LaTeX

- **Linux System Administration (2 year + exp):-**

- ☐ Setting up a 150 + nodes (4000 cores) Linux cluster
- ☐ Managing a Cray CX1 super computer (5 years + exp)
- ☐ Grid Computing with Globus Toolkit, GridFTP, CONDOR, PEGASUS
- ☐ Installation of Scientific Linux and managing software with yum
- ☐ Data storage management with NFS
- ☐ Cluster management and monitoring with tools iLo, CMU and ganglia
- ☐ Security and Identity management with IPTABLES, X.509, LDAP, Shibboleth

## ■ Awards and Recognition

- ☐ **Special Breakthrough Prize In Fundamental Physics 2016** (with the LIGO Scientific Collaboration) Awarded For Detection Of Gravitational Waves 100 Years After Albert Einstein Predicted their Existence [Received prize money of INR 126,000]
- ☐ **2016 Gruber Cosmology Prize** to Rainer Weiss, Kip Thorne, Ronald Drever, and the entire **LIGO team** for pursuing a vision to observe the universe in gravitational waves, leading to a first detection that emanated from the collision of two black holes.
- ☐ A **Fast Track Research** grant [INR 22,10,000] from the **Science & Engineering Research Board (SERB)**, Government of India, SR/FTP/PS-102/2012

- Indo-US Science and Technology Forum (IUSSTF) grant for a two month (September 15, 2012 to November 15, 2012) long visit of USA (Caltech)
- **CSIR-UGC NET (December 2000):** Cleared the **National Eligibility Test (NET)** for determining the eligibility for lectureship and for the award of Junior Research Fellowship (JRF) conducted by the University Grant Commission (UGC) and the Council of Scientific and Industrial Research (CSIR) of India
- **JEST (2001):** Obtained 97.3 percentile score in the **Joint Entrance Screening Test (JEST)** conducted by major research institutes in India for Ph.D a programs.

## ■ Public Media

- **Rudraprayag scientist does state proud**  
- *The Tribune, Dehradun, Feb 28, 2016.*
- **Jayanti Prasad to be honored by PAHAL**  
- *Daily Pioneer, Sunday, 28 February 2016* — PNS — Dehradun — in Dehradun
- **IUCAA researchers get Special Breakthrough Prize for detection of gravitational waves**  
- *Indian Express, Pune, December 5, 2016*
- **9 astronomers from city bag Breakthrough Prize**  
- *Sakal Times, Pune, Thursday, 5 May 2016*
- **LIGO detects gravitational waves for a third time**  
- *India Today, Jan 02, 2017*
- **IUCAA scientists contributed most to country's share**  
- *Times of India, Pune, Oct 17, 2017*

## ■ Teaching & Training

### • Students supervised:-

- Mr. Sudip Mahajan (2019), Pune Institute of Computer Technology, Pune (Master of Engineering thesis), *Learning semantically rich representation of code for clone detection.*
- Ms. Pranati Dalavi (2016), Fergusson College Pune (M.Sc. Physics final year thesis), *Optimization techniques and CMB data analysis.*
- Mr. Harsh Prajapati (2016), Institute of Engineering and Technology, Ahmedabad University, Navrangpura, Ahmedabad 380009, India (B. Tech final year project), *Reconstructing primordial power spectra with WMAP 9 and Planck data with Singular Value Decomposition.*

### • Courses :

- *Big Code*, Invited speaker for the **6th International Winter School on Big Data**, Ancona, Italy - January 13-17, 2020.
- *Cosmic Microwave Background (CMB) - 3 lectures*, Autumn School on Cosmology in BITS Pilani, Pilani, India (Nov 07-09, 2013).  
<https://www.youtube.com/watch?v=cWFa168OV0E>.
- *High Performance Computing (2011) - 4 Lectures*, Inter-University Centre for Astronomy & Astrophysics (IUCAA), Pune, India

■ Talks & Presentations:

- *Gravitational Waves and LIGO India*, OSG All Hands Meeting 2017 San Diego Supercomputer Center (SDSC) at UC San Diego ( March 06 - 09, 2017).
- Public Talk : *Discovering Gravitational Waves with LIGO*
  - Institute of Bioinformatics & Biotechnology, Savitribai Phule Pune University, Pune (Feb 28, 2016).
  - Centre for Modeling & Simulation (CMS), Savitribai Phule Pune University, Pune (March 04, 2016).
  - Maharashtra Institute of Technology, Pune (March 08, 2016).
  - DOR (A forum of NCL Pune Volunteers), Pagdandi - Books Chai Cafe., Pune.

● Important conference & workshop attended:

- School on Parallel Computing and Applications, Institute of Mathematical Sciences, Chennai, India (Jan 07-14, 2005).
- Summer School NOVICOSMO 2005, Novigrad, Croatia (Sept 05-17, 2005).
- Summer School in Cosmology and Astroparticle Physics, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy (July 10-28, 2006).
- Course on Linux Systems, Network and Advanced Administration, Conducted by Linux Learning Center Bangalore at HRI Allahabad (2007, May).
- Performance Enhancement on Emerging Parallel Processing Platforms (PEEP-2008), IUCAA, Pune, (Sept 2008).
- Heterogeneous Computing - Many Core/ Multi-GPU - Performance of Algorithms, Application Kernels, CMSD, University of Hyderabad, Hyderabad, India (October 17-21, 2011).
- IEEE International Conference on High Performance Computing (HiPC), Hotel Le Meridian, Pune, India (Dec 17-21, 2012)
- LSC-Virgo March 2017 Meeting, Pasadena, California, USA (March 12-17, 2017).
- OSG All Hands Meeting, San Diego Supercomputer Center, UCSD, California, USA (March 06-09, 2017)

## ■ Publications

### Representative Papers

1. **Jayanti Prasad** and Jayaram Chengalur,  
Exper. Astron (2012), **33**, 157  
[\[astro-ph.IM/1111.6415\]](#)  
*FLAGCAL: A flagging and calibration package for radio interferometric data*
2. item **Prasad Jayanti** and Souradeep Tarun,  
Phys. Rev. D (2012) **85**, 123008  
[\[astro-ph.CO/1108.5600\]](#)  
*Cosmological parameter estimation using Particle Swarm Optimization (PSO)*
3. Gaurav Goswami and **Jayanti Prasad**,  
Phys. Rev. D (2013) **88**, 023522  
[\[arXiv:1303.4747\]](#)  
*Maximum Entropy deconvolution of Primordial Power Spectrum*

### Ph.D Thesis Work

4. Bagla, J. S., **Prasad, Jayanti**, Ray, Suryadeep (2005)  
Monthly Notices of the Royal Astronomical Society **360**, 194  
[\[astro-ph/0408429\]](#)  
*Gravitational collapse in an expanding background and the role of substructure I: Planar collapse.*
5. Bagla, J. S. and **Prasad, Jayanti** (2009)  
Monthly Notices of the Royal Astronomical Society **393**, 607  
[\[astro-ph/0802.2796\]](#)  
*Gravitational collapse in an expanding background and the role of substructure II: Excess power at small scales and its effect of collapse of structures at larger scales.*
6. Bagla, J. S. and **Prasad, Jayanti** (2006)  
Monthly Notices of the Royal Astronomical Society **370**, 993  
[\[astro-ph/0601320\]](#)  
*Effects of the size of cosmological N-Body simulations on physical quantities – I: Mass Function.*
7. Prasad, Jayanti (2007)  
J. Astrophys. Astron. **28**, 117  
[\[astro-ph/0702557\]](#)  
*Effects of the size of cosmological N-Body simulations on physical quantities – II: Halo formation and destruction rate.*
8. J.S. Bagla, **Jayanti Prasad** and Nishikanta Khandai (2009)  
Monthly Notices of the Royal Astronomical Society (2009), **395**, 918  
[\[astro-ph/0804.1197\]](#)  
*Effects of the size of cosmological N-Body simulations on physical quantities - III: Skewness.*

### Post Doctoral Research work

9. Abhik Ghosh, **Jayanti Prasad**, Somnath Bharadwaj, Sk. Saiyad Ali, Jayaram N. Chengalur (2012)  
Monthly Notices of the Royal Astronomical Society **426**, 3295  
[\[arXiv:1208.1617v1\]](#)  
*Characterizing foreground for redshifted 21 cm radiation: 150 MHz Giant Metre-wave Radio Telescope observations.*
10. N. D. R. Bhat, J. N. Chengalur, P. J. Cox, Y. Gupta, **J. Prasad**, J. Roy, M. Bailes, S. Burke-Spolaor, S. S. Kudale, W. van Straten (2013)  
The Astrophysical Journal Supplement **206**, 2  
[\[arXiv:1302.3418\]](#)  
*Detection of fast transients with radio interferometric arrays.*
11. Suratna Das, Gaurav Goswami, **Jayanti Prasad**, Raghavan Rangarajan (2015)  
Journal of Cosmology and Astroparticle Physics **06**, 001  
[\[arXiv:1412.7093 \[astro-ph.CO\]\]](#)  
*Revisiting a pre-inflationary radiation era and its effect on the CMB power spectrum.*
12. Asif Iqbal, **Jayanti Prasad**, Tarun Souradeep, Manzoor A. Malik (2015)  
Journal of Cosmology and Astroparticle Physics **06**, 014  
[\[arXiv:1501.02647 \[astro-ph.CO\]\]](#)  
*Joint Planck and WMAP Assessment of Low CMB Multipoles.*
13. Suratna Das, Gaurav Goswami, **Jayanti Prasad**, Raghavan Rangarajan (2016)  
Phys. Rev. D **93**, 023516  
[\[arXiv:1506.04808 \[hep-ph\]\]](#)  
*Constraints on just enough inflation preceded by a thermal era.*
14. Mansi Dhuria, Gaurav Goswami, **Jayanti Prasad** (2017)  
Phys. Rev. D **96**, 083529  
[arXiv:1705.11071 \[hep-ph\]](#)  
*Extranatural Inflation Redux .*
15. Richa Arya, Arnab Dasgupta, Gaurav Goswami, **Jayanti Prasad**, Raghavan Rangarajan (2018)  
Journal of Cosmology and Astroparticle Physics **02** 043  
[arXiv:1710.11109 \[astro-ph.CO\]](#)  
*Revisiting CMB constraints on Warm Inflation.*

#### In conference proceedings

16. Jayanti Prasad (2005)  
Bulletin of the Astronomical Society of India (2005), Vol. 33, p. 396-396 (Proceedings ICGC 2004)  
*Gravitational collapse in an expanding background and the effects of small scales perturbations on large scales.*
17. Abhik Ghosh, **Jayanti Prasad**, Somnath Bhardwaj, Sk. Said Ali and Jayaram Chengalur (2014)  
Journal of Physics: Conference Series 484 (2014) 012032 (Proceedings of ICGC 2011, GOA), [winner poster], *Characterizing the diffuse foreground for red-shifted 21 cm HI signal : GMRT 150 MHz observations*
18. **Jayanti Prasad** and Tarun Souradeep (2014)  
Journal of Physics: Conference Series 484 (2014) 012047 (Proceedings of ICGC

2011, GOA), *Cosmological Parameter Estimation using Particle Swarm Optimization*.

**With The LIGO Scientific Collaboration (only key papers)**

19. The LIGO Scientific Collaboration and the Virgo Collaboration(2016)  
Phys. Rev. Lett. **116**, 061102  
[\[arXiv:1602.03837 \[gr-qc\]\]](#)  
*Observation of Gravitational Waves from a Binary Black Hole Merger*  
  
The first direct observation of gravitational waves on 14 September 2015 by the LIGO and Virgo collaborations. This discovery started a new frontier in Astronomy and was recognized with Nobel Prize in Physics (2017) to three lead members of the collaboration and the Special Breakthrough Prize in Fundamental Physics (2016) to the full collaboration.
  20. The LIGO Scientific Collaboration and the Virgo Collaboration(2016)  
Phys. Rev. Lett. **116**, 241103  
[\[arXiv:1606.04855 \[gr-qc\]\]](#)  
*GW151226: Observation of Gravitational Waves from a 22-Solar-Mass Binary Black Hole Coalescence*,
  21. The LIGO Scientific Collaboration and the Virgo Collaboration(2017)  
Phys. Rev. Lett. **118**, 221101  
[\[arXiv:1706.01812 \[gr-qc\]\]](#)  
*GW170104: Observation of a 50-Solar-Mass Binary Black Hole Coalescence at Redshift 0.2*.
  22. The LIGO Scientific Collaboration and the Virgo Collaboration(2017)  
Phys. Rev. Lett. **119**, 141101  
[\[arXiv:1709.09660 \[gr-qc\]\]](#)  
*GW170814: A Three-Detector Observation of Gravitational Waves from a Binary Black Hole Coalescence*.
  23. The LIGO Scientific Collaboration and the Virgo Collaboration(2017)  
Phys. Rev. Lett. **119**, 161101  
[\[arXiv:1710.05832 \[gr-qc\]\]](#)  
*GW170817: Observation of Gravitational Waves from a Binary Neutron Star Inspiral*  
  
First direct detection of gravitational waves together with electromagnetic radiation from the collision of two neutron stars.
  24. The LIGO Scientific Collaboration and the Virgo CollaborationFermi Gamma-Ray Burst Monitor, INTEGRAL (2017)  
Nature (2017), doi:10.1038/nature24471  
[\[arXiv:1710.05835 \[astro-ph.CO\]\]](#),  
*A gravitational-wave standard siren measurement of the Hubble constant*.
- 100 + Other publications with the LIGO Scientific Collaboration.**

■ **References :** Can be provided on request.

■ **Personal Data:**

- ☐ Date of Birth - June 30, 1977.
- ☐ Sex - Male
- ☐ Citizenship - Indian
- ☐ Marital Status - Married

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October 3, 2019