

# DEOVRAT PRASAD

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Postdoctoral Fellow

Physics and Astronomy

3248 Biomedical and Physical Sciences

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## RESEARCH INTERESTS

Feedback Processes in Galaxies, Groups and Clusters, Galaxy Formation and Evolution, Accretion onto Super Massive Black Holes, Numerical Methods

## EMPLOYMENT

**Postdoctoral Fellow**, July 2018 to present  
Michigan State University, East Lansing, US

## EDUCATION

**PhD, Astronomy and Astrophysics**, June 2018  
Indian Institute of Science, Bangalore, India  
Thesis:- *AGN Feedback In Galaxy Clusters - Controlling cooling flows in galaxy clusters by momentum-driven AGN jets*  
Advisor :- Prateek Sharma

**Integrated M.Sc. (B.Sc.+M.Sc.)**, Physics, 2012  
University of Mumbai, Mumbai, India

## FELLOWSHIPS

INSPIRE fellowship for 2007-12 by Dept. Of Science and Technology, Govt. Of India.

CSIR-UGC NET fellowship for 2012-2017 after achieving 24th All India Rank in National Eligibility Test (June-2012)

## COMPUTING GRANTS

NSF XSEDE (Comet) : *Precipitation-Regulated AGN Feedback in Halos From  $10^{12} - 10^{15} M_{\odot}$*  (**PI, 1.23 million CPU hours** equivalent to \$27,619) July 2019 - June 2020.

NSF XSEDE (Comet & Expanse) : *Precipitation-Regulated AGN Feedback in Halos From  $10^{12} - 10^{15} M_{\odot}$*  (**PI, 2.05 million CPU hours** equivalent to \$671,890) Jan 2021 - Dec 2021.

## TEACHING AND MENTORING EXPERIENCE

Teaching Assistant for 'Fluids and Plasma' course at Department of Physics, IISc, taught by Prof. Prateek Sharma  
(August - November, 2014)

Teaching Assistant for 'Electricity, Magnetism and Optics' course for undergraduates at IISc, taught by Prof. Tarun Deep Saini  
(January - April, 2015)

Mentored one student through ‘ACRES 2019’ summer program under department of Computational Mathematics Science and Engineering, Michigan State University (May-July 2019)

Currently mentoring one undergraduate student with Prof. Brian O’Shea in Physics and Astronomy department at Michigan State University (September 2021 onwards)

## **PROGRAMMING EXPERIENCE**

Fortran77/95, C, C++, Python, MPI

Simulations experience on XSEDE and MSU high performance computing facilities

Co-developer of Enzo code - mainly with implementing AGN feedback using “Active Particle” formulation

Co-developer of PLUTO code - mainly with developing AGN feedback and Runge-Kutta-Legendre super-time-stepping method for implementing anisotropic thermal conduction.

## **PRESENTATIONS**

### **Important conference presentations**

Environmental dependence of self-regulating black hole feedback in massive galaxies, HALO 2021, KITP, US, January-March 2021 (**SHORT VIDEO**)

AGN and Stellar Feedback in Galaxy Clusters, ASTRONUM-2019, Paris, France, July 2019 (**TALK**)

Role of BCG and AGN-driven Turbulence in Galaxy Cluster Evolution, SnowCluster - The Physics of Galaxy Clusters, Snowbird, Utah, US, March 2018 (**TALK**)

AGN Feedback in Galaxy Groups, The Physics of Groups and Galaxy Properties therein meeting, Institut d'Astrophysique de Paris (IAP) Paris, France, December 2016 (**TALK**)

AGN Feedback in Galaxy Groups, The Physics of Groups and Galaxy Properties therein meeting, Institut d'Astrophysique de Paris (IAP) Paris, France, December 2016 (**TALK**)

### **Other important presentations**

Environmental effects on Black Hole Feedback Valve in Massive Galaxies, Astro Group Meeting, Centre for Computational Astrophysics, Faltiron Institute, October 2020 (**TALK**)

Environmental effects on Black Hole Feedback Valve in Massive Galaxies, Journal Club, STSCI, August 2020 (**TALK**)

Cool-Core Cycles and Phoenix, Department of Physics,  
Indian Institute of Science, Bangalore, August, 2019 (**TALK**)

AGN feedback in Galaxy Clusters, Physics and Astronomy,  
Michigan State University, November 2018 (**TALK**)

## REFERENCES

### Mark Voit

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Physics and Astronomy  
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Michigan State University  
East Lansing, MI 48824 US  
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### Brian O'Shea

Professor  
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### Prateek Sharma

Associate Professor  
Astronomy and Astrophysics  
Department of Physics  
Indian Institute of Science  
Bangalore, India 560012  
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## PUBLICATIONS

### Lead Author Publications

*Atmospheric Circulation in Simulations of the AGN-CGM*

*Connection at Halo Masses  $\sim 10^{13.5} M_{\odot}$ ,*

Deovrat Prasad, Mark Voit and Brian O'Shea

( To be submitted for publication, October 2021 )

*Environmental Dependence of Self-Regulating Black-hole Feedback  
in Massive Galaxies*

Deovrat Prasad, Mark Voit, Brian O'Shea, and Forrest Glines, 2020,  
ApJ, 905, 50

*Cool-Core Cycles and Phoenix*

Deovrat Prasad, Prateek Sharma, Arif Babul, Mark Voit and Brian  
O'Shea, 2020, MNRAS, 495, 594

*Cool-Core Clusters : Role of BCG, Star Formation & AGN-Driven  
Turbulence*

Deovrat Prasad, Prateek Sharma, and Arif Babul 2018, ApJ, 863, 62

*AGN jets driven stochastic cold accretion in cluster cores*

Deovrat Prasad, Prateek Sharma, and Arif Babul, 2017, MNRAS,  
471, 1531

*Cool core cycles: Cold gas and AGN jet feedback in cluster cores*

Deovrat Prasad, Prateek Sharma, and Arif Babul, 2015, ApJ, 811, 108

### **Other Publications**

*A Black-Hole Feedback Valve in Massive Galaxies*

Voit, G. M. *et al.* (including **Prasad, D.** ) 2020, ApJ, 899, 70

*Figuring Out Gas & Galaxies In Enzo (FOGGIE). IV. The Stochasticity of Ram Pressure Stripping in Galactic Halos*

Simons, R. C. *et al.* ( including **Prasad, D.** ) 2020, arXiv:2004.14394

*Scalable explicit implementation of anisotropic diffusion with Runge-Kutta-Legendre super-time-stepping*

Vaidya, B., **Prasad, D.** *et al.* 2017, MNRAS , 472, 3147