

DEOVRAT PRASAD

Postdoctoral Fellow
Physics and Astronomy
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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, November 2022 onwards, Cardiff University, Cardiff, UK

Postdoctoral Fellow, July 2018 - June 2022, 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. (5 year program), 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**) 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**) Jan 2021 - June 2022.

NSF XSEDE (Stampede & Expanse) : Probing Galaxy Formation at Low and High Redshifts
(**Co-PI, 1.6 million CPU hours**) Jan 2022 - Dec 2022.

PROPOSAL REVIEW EXPERIENCE

2022, subject matter expert reviewer in a NASA peer review.

2019, subject matter expert reviewer for ACRES REU program by CMSE department at MSU.

TEACHING AND MENTORING EXPERIENCE

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

Teaching Assistant, **Electricity, Magnetism and Optics**, Undergraduate course, 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)

MAJOR COLLABORATIONS

Member of Figuring Out Gas & Galaxies in Enzo (FOGGIE) collaborations

PROGRAMMING EXPERIENCE

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

Simulations experience on XSEDE, NASA 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 effects on Black Hole Feedback Valve in Massive Galaxies, 6th ICM Theory and Computation Workshop, Neils Bohr Institute, Copenhagen, Denmark, August 2022. (TALK)

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**)

Other important presentations

Cool Core Cycles - AGN Feedback in Massive Galaxies, Groups and Clusters, Department of Physics, Indian Institute of Technology Kanpur, August 2022 (**TALK**)

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, Astronomy & Astrophysics Colloquium, Indian Institute of Science, Bangalore, India, August 2019 (**TALK**)

The Feedback Loop : Controlling cooling flows in galaxy clusters, Physics and Astronomy, Astronomy Colloquium, University of Notre-Dame, US, December 2018 (**TALK**)

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

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, 2022, ApJ, 932, 18

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, ApJ, 905, 167

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

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

REFERENCES

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