PRAKRITI PAL CHOUDHURY

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CURRENT POSITION

Graduate student(Integrated-PhD), Astrophysics
Indian Institute of Science, Bangalore, India
Advisor: Prof. Prateek Sharma (expected completion: Sept 2019)

EDUCATION

Master of Science in Physics (Integrated-PhD), 2012-2014
Indian Institute of Science (IISc), Bangalore, India

Bachelor of Science, 2009-2012
St. Xavier's College, Kolkata (Autonomous), University of Calcutta, India
Major: Physics (First class, Honours)
Minor: Mathematics and Computer Science

PUBLICATIONS

- **Prakriti Pal Choudhury**, Prateek Sharma
  "Cold gas in cluster cores: Global stability analysis and non-linear simulations of thermal instability in spherical and plane-parallel atmospheres"
  arXiv: 1512.01217 ; MNRAS, 457, 2554-2568 (2016)
- **Prakriti Pal Choudhury**, Guinevere Kauffmann, Prateek Sharma
  "A 1-dimensional hydrodynamic model of the cooling and heating of gas in dark matter haloes from $z = 6$ to $z = 0$"
  arXiv: 1808.05231; MNRAS, 485(3), 3430-3445 (2019)
- **Prakriti Pal Choudhury**, Prateek Sharma, Eliot Quataert
  "Multiphase gas in the circumgalactic medium: relative role of $t_{\rm cool}/t_{\rm ff}$ and density fluctuations"
  arXiv: 1901.02903 MNRAS (in press)

COMPUTATIONAL SKILLS

Languages & Softwares: Python, C, Fortran, Matlab
Experienced in using HPC: Cray xc40 (http://www.serc.iisc.ac.in/cray-xc40-named-as-sahasrat/)
Self-written codes

- Used **python to develop a pseudospectral code for 2D geometry** in order to calculate the eigenvalues and eigenfunctions of the global radial modes in a cluster due to the local thermal instability (links available in my website)
- Used **python and cython to develop a 1D Lagrangian hydrodynamic code** to study diffuse gas in the galaxy clusters and smaller haloes over a range of redshift, in the smooth cosmological accretion regime (links soon to be available)

RESEARCH EXPERIENCE

- Designed a "semi-cosmological" 1D/2D hydrodynamic model for gas evolution in dark matter halos of a wide range of masses (cluster+group+galaxy) and redshifts including radiative cooling and feedback. Using this model to study gas evolution in halos.
- Analysed the relative role of $t_{\rm cool}/t_{\rm ff}$ and density fluctuations, $\delta\rho/\rho$ and also generalized the threshold physical conditions for the condensation of gas in clusters.
- Studying the large scale structure of astrophysical jets with special interest in AGN jets: very high resolution simulations of jet-medium interaction; shocks, sound waves etc.
- Studied thermally unstable linear global g-modes in cluster cores; performed high-resolution simulations to understand the threshold condition for multiphase condensation better
- Accretion disk dynamics for Master's Project (April-July, 2014). Studied non-axisymmetric instability in hydrodynamic disks, MRI instability in Magnetohydrodynamic disks and effect of high magnetic fields in GRMHD disks.
- Indian Academy of Science fellow at Harish Chandra Research Institute, Allahabad, India, in May-July,2012. Tensor algebra, General Relativity and Black holes.

- Visiting student with Dr. Avinash Deshpande at Raman Research Institute, Bangalore, India in October, 2011. Data analysis of pulsating sources:technique for the estimation of rotation measure(RM).

FELLOWSHIPS

- Visiting PhD student fellowship at Max Planck Institute for Astrophysics, Garching, Germany, twice, from October, 2016 to March, 2017 and October, 2018 to March, 2019
- IISc Fellowship for the Integrated Master's (2012-2014) and PhD program
- Indian Academy of Sciences Summer Research Fellowship, May-July, 2012(Harish Chandra Research Institute, Allahabad, India)
- Visiting Student Fellowship(VSP) at Raman Research Institute, Bangalore, India, October, 2011
- INSPIRE-DST Fellowship for Undergraduate Studies, 2009-2012

TALKS AND POSTERS

- Thesis colloquium at Indian Institute of Science, Bangalore, India, titled "Cooling, heating and gas evolution in the circumgalactic medium", June 2019.
- **Invited talk** at "The Physics of the intracluster medium: theory and observations", March 2019, Budapest, Hungary.
- Lunch talk at Space Telescope Science Institute, Baltimore, January 2019.
- Astro lunch talk at Yale University, Connecticut, January 2019.
- CIERA lunch talk at Northwestern University, Evanston, January 2019.
- Astro lunch talk at CCA, Flatiron Institute, New York, January 2019.
- **Invited talk** at "ICM Physics and modeling, October, 2018 " titled "Multiphase gas in cluster cores and CGM", at Garching, Germany.
- Presented a poster on 'Multiphase gas in circumgalactic medium: role of $t_{\rm cool}/t_{\rm ff}$ and $\delta\rho/\rho$' in Snowcluster, 2018 at Salt Lake City, Utah, USA, in March, 2018.
- KIPAC tea talk on 'Multiphase gas in cluster cores', Stanford University, USA in March, 2018
- Talk in the group meeting of Prof. Eliot Quataert on 'Gas evolution in dark matter haloes: CGM & ICM' at UC Berkeley in March, 2018
- Talk for 'MPA-workshop on SAMs' at Garching, Germany in July, 2017. 'Hot gas in accreting dark matter halos: A simple 1D model'
- Talk for 'Institute Seminar' at Max Planck Institute for Astrophysics, Garching, Germany in February,2017. 'Cold gas formation in galaxy cluster cores'
- Poster on "Cold gas in cluster cores: Global stability analysis and non-linear simulations" at the In-house symposium, Indian Institute of Science, in November, 2015. Received **"Best poster award in theory"**.

SCHOOLS AND CONFERENCES

- Intracluster medium: theory and computation, March, 2019 at Budapest, Hungary
- ICM Physics and modeling, October, 2018 at Garching, Germany
- Bubbles big and small, June, 2018 at IISc Bangalore, India
- Snowcluster-2018, March, 2018 at Salt Lake City, Utah, USA
- MPA workshop on SAMs, July, 2017 at Garching, Germany
- Astronomical Society of India Meeting, February, 2015
  Poster: "Numerical global eigen mode analysis on thermal instability in the intercluster medium"
- Radio Astronomy Winter School (NCRA-TIFR & IUCAA), Pune, December, 2010
  Group poster: "High Redshift Universe" (**second prize**).

TEACHING ASSISTANTSHIP

Course: Classical Mechanics
August-December Semester, 2014
For a class of UG third years and Integrated-PhD first years