Samik Mitra

Prime Minister's Research Scholar
Department of Physics
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Experiences

Senior Research Fellow (SRF), IIT GUWAHATI **July, 2021 - ongoing**
Completed first 2 years of Ph.D. as a JRF and promoted as a senior fellow based on the performance.

Junior Research Fellow (JRF), IIT GUWAHATI **July, 2019 – June-2021**
Joined as a JRF in IIT Guwahati to pursue my research in Theoretical Astrophysics under the supervision of ***Dr. Santabrata Das***.

Education

Ph. D. in Astrophysics, IIT GUWAHATI **July, 2019 – ongoing**
Advisor: Prof. Santabrata Das

My research focuses on the generation and evolution of magnetic fields in the accretion disk with the help of state-of the-art numerical schemes mainly following the general-relativistic magneto-hydrodynamics (GRMHD) codes. With our model, we aim to explain the possible structure of magnetic fields in the black hole systems, which is extremely challenging task.

SEM	Course work	Grades	SPI	CPI
I	PH 705 – Quantum Field Theory & Standard Model	AA	9.43	9.69/10 HIGHEST
I	PH 707 – Computational Physics	AB		
II	PH 706 – Gravitation & Cosmology	AA	10	
II	PH 708 – Mini Project	AA		

M.Sc. in Astrophysics, University of Delhi (DU), Delhi **June, 2018 – July 2016**

- Completed the M.Sc. in Physics from Department of Physics & Astrophysics, DU, with an aggregate of 64.40%.
- Specialization in Theoretical Physics (Astrophysics, General Relativity, Cosmology, Plasma Physics) top 18/300.
- M.Sc. project titled "Astrophotography of a Cluster (Orion field) using CCD camera" under Prof. H.P.Singh, DU.

B.Sc.(H) in Astrophysics, University of Calcutta (CU) **June, 2016 – July 2013**

- Pursued my bachelors in Physics from Raja Peary Mohan College, CU, with an aggregate of 66.25%.
- Scored the highest marks in the laboratory courses.
- Ancillary subjects included Mathematics and Chemistry.

Secondary & Higher Secondary, Chandernagore Kanailal Vidyamandir, W.B **May, 2013 – July 2005**

- 2013: Completed Class-XII under W.B.C.H.S.E. with 81% (first class) in pure science stream (PHYS-CHEM-MATH-BIOS).
- Passed Class-X under W.B.B.S.E. with an aggregate of 87.5% (first class).

RESEARCH INTERESTS:

Topics: Accretion flows around compact objects (black holes, neutron stars, white dwarfs), relativistic jets/outflows, magnetohydrodynamics, general relativity, near horizon science, black hole spins, turbulence, instabilities, Quasi-periodic Oscillations (QPOs), thermal and non-thermal emissions in active galactic nuclei, and BH-X-ray binaries.

Methods: Global general relativistic magnetohydrodynamic (GRMHD) simulation codes, Athena ++, BHAC, H-ARM, etc., General relativistic ray-tracing codes (grPyHole, GRRT, etc.) for the post-processing of the simulation results to generate images of Black holes.

RESEARCH / WORKING EXPERIENCE:

Expertise in the GRMHD codes: Athena++, BHAC (learning phase).
Familiar with the Ray-tracing software: grPyHole (learning phase).
High performance Computation.
Languages: Fortran, C, C++, Python, Mathematica, Latex, Ms-office, VS-code

WORKSHOP/CONFERENCES:

- International workshop on **NUMERICAL ASTROPHYSICS**, organized by Ferdowsi University of Mashhad, Mashhad, Iran, July 27-31th, 2020.
- **North-East Meet of Astronomers (NEMA) - VI**, IIT Guwahati, Assam, India 10 - 13 November, 2020.
- Prof. **S. M. Chitre Memorial Symposium** on Frontiers in Astrophysics and Fluid Dynamics, Organized by UM-DAE Centre for Excellence in Basic Sciences, University of Mumbai, India, 6 - 8 May, 2021.
- Online Workshop on **HPC in Astrophysics and Astronomy**, September 20-23, 2021, NCRA-TIFR and IIT Kharagpur under the aegis of National Supercomputing Mission.
- International Online Conference **Black Holes Inside and Out (BHIO 2021)** from September 27th to October 1st 2021.
- Regular black holes in quantum gravity and beyond: from theory to shadow observations, 18-21 October.
- **PMRF talk at IITG**, on 15-16, November, 2021.
- Will participate on the "XII-Biennial National conference of **PANE: Physics Academy of North East**", from 15-17 December, 2021.

TEACHING EXPERIENCE:

1. Teaching assistantship in IIT Guwahati for several courses for past 4 semesters (PH-110, PH-403, PH-417 PH-101).
2. Teaching assistant at Department of Physics, North Gauhati College, Assam, for last 1 year for the honours courses (PHY-HC-1026, PHY-HC-4016, PHY-HC-3016) which is affiliated under Gauhati University.
3. Guiding (present/past) B.Tech. (Ashish Menon) and M.Sc. student (Alay Pal, Ayan Chakrabarty, Chinmay) in their master's and BTP thesis.

QUALIFYING EXAMS:

GRADUATE APTITUDE TEST IN ENGINEERING (GATE) 2019, with a percentile of 93.12.

AWARDS

Prime Minister's Research Fellowship **September, 2020 – Ph.D. tenure**
May 2020, Lateral Entry Channel

MHRD Fellowship, IIT Guwahati **July, 2019 – August 2020**

Other Achievements/Hobbies:

- Won several sketching competitions on district levels in West Bengal.
- Whistle singing and photography are one of my passions.

Declaration:

I hereby declare that all above mentioned information are tune to the best of my knowledge.

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