CV

Name: Farrukh Nauman
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RESEARCH INTERESTS

hydrodynamic and magnetohydrodynamic shear turbulence, accretion disks, Magnetorotational Instability (MRI), dynamo theory, astrophysical fluids and plasmas, nonlinear dynamics and chaos, computational fluid dynamics.

EDUCATION

Ph. D. Physics — Oct. 9th, 2015
University of Rochester
Advisor: Eric Blackman.
Thesis: *Turbulence in Rotating and Non-Rotating Magnetohydrodynamic Shear Flows.*

M. Phil. Physics — 2009
Quaid-i-Azam University, Islamabad, Pakistan.
Thesis: *Modified gravity as an explanation for cosmic acceleration.*

M. Sc. Physics — 2007
Quaid-i-Azam University, Islamabad, Pakistan.

B. Sc. Physics and Mathematics — 2005
University of the Punjab, Lahore, Pakistan.

EXPERIENCE

Origins Fellow — Sep. 15th 2018 -
Chalmers University of Technology, Gothenburg (Sweden)

PostDoctoral Researcher — Sep. 15th 2015 - Sep. 14th 2018
Niels Bohr International Academy, Niels Bohr Institute

Research Assistant — June 2010 - August 2015
Department of Physics and Astronomy, University of Rochester

Teaching Assistant — Fall 2009 - Spring 2010
Physics and Astronomy, University of Rochester.
Grader of PHY 113 (Fall 2009), led workshops for PHY 121 (Spring 2010).

Research Scientist — Feb-Aug 2009
National Centre for Physics, Islamabad, Pakistan.
Worked in the high energy phenomenology group.

HONORS, AWARDS, GRANTS

HPC-Europa3 travel+computing grant to visit U. Bremen/ZARM (Germany). — Mar 2019

HPC-Europa3 travel+computing grant to visit NORDITA (Stockholm). — Mar-Apr 2018

Horton fellowship from Laboratory for Laser Energetics. 2010-2015

Susumu Okubo Prize for the highest performance on the graduate physics written comprehensive exam and excellence in coursework. 2011

TALKS

"*Energy transfers in turbulent MHD shear flows*"
ZARM, University of Bremen, Germany. July 25th, 2018

"*Magnetized accretion disks*"
Chalmers, Sweden. May 23rd, 2018

"*Magnetic field evolution in accretion disks*"
ZARM, University of Bremen, Germany. Oct. 18th, 2017

"*Large scale magnetic fields and magnetic helicity*"
NTALK (Colloquium), **Niels Bohr International Academy**, Oct. 6th, 2017

"*Influence of rotation and domain size in MHD shear turbulence*"
European Turbulence Conference 16, Stockholm, Sweden. Aug. 21st-24th, 2017

"*Influence of rotation in unforced MHD shearing box turbulence*"
NCAR Workshop on Turbulence and Waves in Flows Dominated by Rotation. Aug. 15th-19th, 2016

"*Turbulence in shear MHD flows: Implications for accretion disks*"
Theory seminar at **Princeton Plasma Physics Lab**, Aug. 4th, 2016

"*Turbulence in Rotating and Non-Rotating Magnetohydrodynamics Shear Turbulence*"
CPH-Lund meeting, **Lund University**, Nov. 18th, 2015

"*Non-rotating MHD Plane Couette Flow*"
Turbulence Workshop, **University of Rochester**, August 5th, 2015

PUBLICATION LIST

1. **Farrukh Nauman**, Joonas Nättilä. 2019. *Exploring helical dynamos using machine learning*. (arxiv.org/abs/1905.08193)
2. **Farrukh Nauman**, Martin E. Pessah. 2018. *Transport properties of Keplerian flows in extended domains with no imposed field*. MNRAS, 480, 204.
3. **Farrukh Nauman**, Eric G. Blackman. 2017. *Shearing box simulations in the Rayleigh unstable regime*. MNRAS, 467, 1652, (arxiv.org/abs/1507.04711)
4. **Farrukh Nauman**, Eric G. Blackman. 2017. *Sustained turbulence and magnetic energy in non-rotating shear flows*. Phys. Rev. E, 95, 033202, (arxiv.org/abs/1701.03531)
5. **Farrukh Nauman**, Martin E. Pessah. 2016. *Sustained turbulence in differentially rotating magnetized fluids at low magnetic Prandtl number*. ApJ 833, 187, (arxiv.org/abs/1609.08543)
6. Eric G. Blackman, **Farrukh Nauman**. 2015. *Some challenges and directions for next generation accretion disc theory*. JPP, 81, 395810505, (arxiv.org/abs/1501.00291)
7. **Farrukh Nauman**, Eric G. Blackman. 2015. *Sensitivity of the Magnetorotational Instability to the shear parameter in stratified simulations*. MNRAS, 446, 2102 (arxiv.org/abs/1409.2442)

8. **Farrukh Nauman**, Eric G. Blackman. 2014. *On characterizing nonlocality and anisotropy for the magnetorotational instability*. MNRAS, 441, 1855 (arxiv.org/abs/1403.4288)

9. Eric G. Blackman, **Farrukh Nauman**, Richard G. Edgar. 2010. *Quantifying the imprecision of accretion theory and implications for multi-epoch observations of protoplanetary discs*. (arxiv.org/abs/1010.1478)

SKILLS

Machine learning:
Algorithms: Random forests, Generalized Linear Models, Convolutional Neural Networks.
Libraries: sci-kit learn (python), keras/tensorflow (python)

Computational Fluid Dynamics:
Grid based codes: athena (C), pencil (F90), pluto (C), nirvana (C).
Spectral codes: snoopy (C), shenfun (python).

Programming languages: Python (intermediate), C (intermediate), Fortran 90 (basic), MATLAB (basic), julia (basic).

PROFESSIONAL REFEREEING SERVICE

Monthly Notices of Royal Astronomical Society, Journal of Cosmology and Astrophysics, Astrophysical Journal, European Physical Journal Plus.