PiyaliChatterjee

Indian Institute of Astrophysics

about

Indian Institute of Astrophysics
II Block Koramangala
Bengaluru-560034
India
piyali.chatterjee@iiap.res.in
http://www.piyalichatterjee.net

computational skills

Developer for Pencil Code &
SURYA code
User of MFE code
Analysis & Visualization: IDL
Paraview, Matlab

HPC experience

Yellowstone (NCAR/Wyoming)
Pleaides (NASA)
Akka (Umeá University/Sweden)
Ferlin (PDC/KTH/Sweden)

personal

Married,
Daughter (b Oct 2011)

research interests

Space weather, Coronal Mass Ejections & Flares, Computational Magneto-hydrodynamics, Helioseismology, Solar dynamo

academic background

2015–now	**Indian Institute of Astrophysics** Reader	Bangalore, India
2014–2015	**Institute for theoretical Astrophysics, Univ of Oslo** Post Doctoral Fellow	Oslo, Norway
2012–2014	**High Altitude Observatory** Post Doctoral Fellow	Boulder, CO
2009–2011	**NORDITA** Post Doctoral Fellow	Stockholm, Sweden
2008–2009	**T.I.F.R** Visiting Fellow	Mumbai, India
2007–2008	**Dept of Physics, IISc** IISc research associate	Bangalore, India
2003–2007	**Dept of Physics, IISc** *PhD thesis*: Understanding Solar Magnetic Fields: their Generation, Evolution and Variability	Bangalore, India
2000–2003	**Dept of Physics & Center for Atmospheric and Oceanic Sciences, IISc** Bangalore, India *Master of Science Thesis*: Structure, genesis and scale selection of the tropical quasi-biweekly mode	

highlights

2016	**New twist to simulating solar flares** Simulations show for the first time how the magnetic fields that produce solar flares can extend out of the Sun by acquiring a twist. "Editors' suggestion" in Phys. Rev. Lett. and featured in "Physics" by a VIEWPOINT by Prof. Axel Brandenburg.	Phys. Rev. Lett. 116, 101101
2013	**Fast cannibal CMEs** For the first time we model cannibalistic homologous CMEs in a 3D MHD simulation of emerging coronal flux ropes.	Astrophysical J. Letters 778, L8

2011 **Parity Breaking in a hydromagnetic system** Phys. Rev. E, 84, 025403(R)
Observe symmetry breaking and non-zero helicity in a hydromagnetic simulation of magnetic buoyancy instability without rotation.

2009 **Solar torsional oscillations** Phys. Rev. Letters 103, 099902
We provide an explanation for solar torsional oscillations preceding the sunspot cycle using a flux transport solar dynamo model which accounts for Alfven waves.

2007 **Solar cycle prediction** Phys. Rev. Letters 98, 131103
Predict a weak solar cycle 24 using a flux transport dynamo model. Our research about the solar magnetic cycle has been described in the national daily, The Telegraph and the science magazine, Physics World. Was selected as "Editors' suggestion" in Phys. Rev. Lett.

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publications: 23, CITATIONS: 977, H-INDEX: 13

peer reviewed

Modeling Repeatedly Flaring delta Sunspots
P. Chatterjee, V. Hansteen, M. Carlsson
Phys. Rev. Lett **116** *101101, (2016)*

Simulation of Homologous and Cannibalistic Coronal Mass Ejections produced by the Emergence of a Twisted Flux Rope into the Solar Corona
P. Chatterjee, Y. Fan
ApJ **778***, L8 L8, (2013)*

Alpha effect due to buoyancy instability of a magnetic layer
P. Chatterjee, D. Mitra, M. Rheinhardt, A. Brandenburg
Astron.Astrophys. **534***, A46 A46, (2011)*

Spontaneous chiral symmetry breaking by hydromagnetic buoyancy
P. Chatterjee, D. Mitra, A. Brandenburg, M. Rheinhardt
84*, 025403 025403, (2011)*

Reynolds stress and heat flux in spherical shell convection
P. J. Käpylä, M. J. Mantere, G. Guerrero, A. Brandenburg, P. Chatterjee
Astron.Astrophys. **531***, A162 A162, (2011)*

What do global p-modes tell us about banana cells?
P. Chatterjee
Journal of Physics Conference Series **271***, 012066 012066, (2011)*

Magnetic helicity fluxes in interface and flux transport dynamos
P. Chatterjee, G. Guerrero, A. Brandenburg
Astron.Astrophys. **525***, A5 A5, (2011)*

Turbulent transport in hydromagnetic flows
A. Brandenburg, P. Chatterjee, F. Del Sordo, A. Hubbard, P. J. Käpylä, M. Rheinhardt
Physica Scripta Volume T **142***, 014028 014028, (2010)*

Shear-driven and diffusive helicity fluxes in dynamos
G. Guerrero, P. Chatterjee, A. Brandenburg
MNRAS **409** *1619–1630, (2010)*

Can catastrophic quenching be alleviated by separating shear and effect?
P. Chatterjee, A. Brandenburg, G. Guerrero
Geophysical and Astrophysical Fluid Dynamics **104** *591–599, (2010)*

Equatorial magnetic helicity flux in simulations with different gauges
D. Mitra, S. Candelaresi, P. Chatterjee, R. Tavakol, A. Brandenburg
Astronomische Nachrichten **331** *130, (2010)*

Solar Flows and Their Effect on Frequencies of Acoustic Modes

P. Chatterjee, H. M. Antia
ApJ **707** *208–217, (2009)*

Small-scale magnetic helicity losses from a mean-field dynamo
A. Brandenburg, S. Candelaresi, P. Chatterjee
MNRAS **398** *1414–1422, (2009)*

Why Does the Sun's Torsional Oscillation Begin before the Sunspot Cycle?
S. Chakraborty, A. R. Choudhuri, P. Chatterjee
Physical Review Letters **102**, *041102 041102, (2009)*

How Do f-Mode Frequencies Change with Solar Radius?
P. Chatterjee, H. M. Antia
ApJ **688**, *L123 L123, (2008)*

Solar activity forecast with a dynamo model
J. Jiang, P. Chatterjee, A. R. Choudhuri
MNRAS **381** *1527–1542, (2007)*

Predicting Solar Cycle 24 With a Solar Dynamo Model
A. R. Choudhuri, P. Chatterjee, J. Jiang
Physical Review Letters **98**, *131103 131103, (2007)*

On Magnetic Coupling Between the Two Hemispheres in Solar Dynamo Models
P. Chatterjee, A. R. Choudhuri
Sol.Phys. **239** *29–39, (2006)*

Development of twist in an emerging magnetic flux tube by poloidal field accretion
P. Chatterjee, A. R. Choudhuri, K. Petrovay
Astron.Astrophys. **449** *781–789, (2006)*

Reply to the Comments of Dikpati et al.
A. R. Choudhuri, D. Nandy, P. Chatterjee
Astron.Astrophys. **437** *703–704, (2005)*

Full-sphere simulations of a circulation-dominated solar dynamo: Exploring the parity issue
P. Chatterjee, D. Nandy, A. R. Choudhuri
Astron.Astrophys. **427** *1019–1030, (2004)*

Helicity of Solar Active Regions from a Dynamo Model
A. R. Choudhuri, P. Chatterjee, D. Nandy
ApJ **615** *L57–L60, (2004)*

Structure, genesis and scale selection of the tropical quasi-biweekly mode
Piyali Chatterjee, B. N. Goswami
Quarterly Journal of the Royal Meteorological Society **130** *1171–1194, John Wiley Sons, Ltd., (2004)*

invited talks

"A new twist to numerical simulations of solar flares", EWASS 2016, 4-8 July, 2016, Athens, Greece

"Modeling of Repeatedly flaring delta sunspots", Solar waves and dynamics meeting IBUKS 2016, 13-17 June, 2016, KU Leuven, Belgium

"Modeling of the solar torsional oscillations and how well they compare with observations", ISSI workshop on solar cycle, Bern, 10-15 Nov, 2013

"Models of Solar torsional oscillations", IAU symposium 286, Comparative Magnetic Minima, Mendoza, Argentina, 3-7 Oct 2011

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Akka (Umeá University/Sweden)
Ferlin (PDC/KTH/Sweden)

achievements

2004–2007 **Shyama Prasad Mukherjee Scholarship** Council for Scientific and Industrial Research, India
Best Physics Candidate among 3000 Junior Research Fellows.

2002–2003 **Kumari L. A. Meera award** Dept of Physics, IISc, Bangalore
Adjudged the best Integrated PhD Student in Physical Sciences at Indian Institute of Science.

2000 **Gold Medal** Mumbai University
Highest marks in Physics in Bachelor of Science

2000 **Joint Entrance Screening Test** Topped the JEST

1999-2000 **Gold Medal** Indian Association of Physics Teachers
Topped the National Graduate Physics Examination (N.G.P.E.) for consecutive years