

**NAME** : DR. CHETANA JAIN  
**DESIGNATION** : ASSOCIATE PROFESSOR  
**ADDRESS** : DEPARTMENT OF PHYSICS  
HANSRAJ COLLEGE  
UNIVERSITY OF DELHI, DELHI 110007  
**CONTACT NO.** : +91-11-27667458  
**EMAIL ADDRESS** : chetanajain11@hrc.du.ac.in



## EDUCATIONAL QUALIFICATION

- **Ph. D. (2010)**
  - Thesis Title: Study of X-ray Pulsars using Satellite Data
  - Department of Physics and Astrophysics, University of Delhi
- **M. Sc. Physics (2005)**
  - Hansraj College, University of Delhi
- **B. Sc. (H) Physics (2003)**
  - Hansraj College, University of Delhi

## RESEARCH EXPERIENCE

### SPECIALIZATION/RESEARCH INTEREST

Electronics and Astrophysics

My research interests include,

- Orbital Evolution of X-ray Binaries
- Pulse profile evolution
- Broad band X-ray Spectroscopy

### MEDIA COVERAGE:

Here are the links to my recent discovery of an extra solar planet

[Discovery of Extra Solar Planet](#)

[NASA Exoplanet Archive](#)

## PUBLICATIONS STATISTICS

- In refereed journals = 17 (13 international + 4 national)
- In conference proceedings = 2
- Astronomer's telegram = 2
- h-index = 8

### PUBLICATIONS/ARTICLES IN REFEREED JOURNALS

- 1) Broad-band spectral analysis of LMXB XTE J1710-281 with Suzaku  
Sharma, P., Sharma, R., **Jain, C.\***, & Dutta, A., 2020, MNRAS, 496, 197  
(Online ISSN: 1365-2966) (Impact Factor: 5.356)

- 2) Study of the reflection spectra of SAX J1748.9-2021  
Sharma, R., **Jain, C.**, & Dutta, A., 2019, MNRAS, 482, 1634  
(Online ISSN: 1365-2966) (Impact Factor: 5.356)
- 3) Spectral properties of MXB 1658-298 in the low/hard and high/soft state  
Sharma, R., Jaleel, A., **Jain, C.**, Pandey, J. C., Paul, B., & Dutta, A., 2018, MNRAS, 481, 5560  
(Online ISSN: 1365-2966) (Impact Factor: 5.356)
- 4) Thermonuclear X-ray burst of MXB 1658-298 with *NuSTAR*  
Sharma, R., Jaleel, A., **Jain, C.**, Paul, B., & Dutta, A., 2018, JAA, 39, 16  
(Online ISSN: 0973-7758) (Impact Factor: 1.273)
- 5) Indication of a massive circumbinary planet orbiting the Low Mass X-ray Binary MXB 1658-298  
**Jain, C.\***, Paul, B., Sharma, R., Jaleel, A., & Dutta, A., 2017, MNRAS -- Letters, 468, L118  
(Online ISSN: 1365-2966) (Impact Factor: 5.356)
- 6) Torque reversals and pulse profile of the pulsar 4U 1626-67  
Beri, A., **Jain, C.**, Paul, B., & Raichur, H., 2014, MNRAS, 439, 1940  
(Online ISSN: 1365-2966) (Impact Factor: 5.356)
- 7) Pulse profile stability of the Crab pulsar  
**Jain, C. \*** & Paul, B., 2011, RAA, 11, 1134  
(Online ISSN: 2397-6209) (Impact Factor: 1.512)
- 8) Search for pulsations in the LMXB EXO 0748-676.  
**Jain, C.\*** & Paul, B., 2011, RAA, 11, 577  
(Online ISSN: 2397-6209) (Impact Factor: 1.512)
- 9) Eclipse Timings of the LMXB XTE J1710-281: Orbital Period Glitches.  
**Jain, C.\*** & Paul, B., 2011, MNRAS, 413, 2  
(Online ISSN: 1365-2966) (Impact Factor: 5.356)
- 10) New measurement of orbital and spin period evolution of the Accretion Disk Corona source 4U 1822-37.  
**Jain, C.\***, Paul, B., & Dutta, A., 2010, MNRAS, 409, 755  
(Online ISSN: 1365-2966) (Impact Factor: 5.356)
- 11) An X-ray Bright Nucleus in the Low Surface Brightness Galaxy UGC 6614.  
Naik, S., Das, M., **Jain, C.** & Paul, B., 2010, MNRAS, 404, 2056  
(Online ISSN: 1365-2966) (Impact Factor: 5.356)
- 12) Spectral and temporal changes associated with flux enhancement in 4U 1626-67.  
**Jain, C.\***, Paul, B., & Dutta, A., 2010, MNRAS, 403, 920  
(Online ISSN: 1365-2966) (Impact Factor: 5.356)
- 13) Orbital X-ray modulation study of three supergiant HMXBs.  
**Jain, C.\***, Paul, B., & Dutta, A., 2009, RAA, 9, 1303  
(Online ISSN: 2397-6209) (Impact Factor: 1.512)
- 14) Discovery of short orbital period in Supergiant Fast X-ray Transient IGR J16479-4514.  
**Jain, C.\***, Paul, B., & Dutta, A., 2009, MNRAS -- Letters, 397, 11  
(Online ISSN: 1745-3933) (Impact Factor: 5.356)

- 15)** Orbital evolution measurement of the accreting millisecond X-ray pulsar SAX J1808.4-3658.  
**Jain, C.\***, Dutta, A., & Paul, B., 2007, JAA, 28, 197  
(Online ISSN: 0973-7758) (Impact Factor: 1.273)
- 16)** Pulse phase dependence of the magnetar bursts.  
**Jain, C.\***, Dutta, A., & Paul, B., 2007, JAA, 28, 185  
(Online ISSN: 0973-7758) (Impact Factor: 1.273)
- 17)** Search for orbital motion of the pulsar 4U 1626-67: Candidate for a neutron star with a supernova fallback accretion disk.  
**Jain, C.\***, Paul, B., Joshi, K., Dutta, A., & Raichur, H., 2007, JAA, 28, 175  
(Online ISSN: 0973-7758) (Impact Factor: 1.273)

#### **PUBLICATIONS/ARTICLES IN CONFERENCE PROCEEDINGS**

- 1)** Orbital evolution of the Low Mass X-ray Binaries 4U 1822-37, XTE J1710-281 and MXB 1658-298  
Paul, B., & **Jain, C.** 2010, The First Year of MAXI: Monitoring Variable X-ray Sources, 26
- 2)** Orbital evolution of X-ray binaries and quasi-periodic oscillations in X-ray pulsars.  
Paul B., Raichur H., **Jain C.**, James M., Devasia J., & Naik S., 2011, ASI Conference Proceedings, 3, 29

#### **ASTRONOMER'S TELEGRAM**

- 1)** A torque reversal to spin-up in 4U 1626-67. **Jain, C.** & Paul, B., 2009, ATel 2095
- 2)** Detection of periodic X-ray modulation of SFXT IGR J16207-5129 in the Swift-BAT light curve. **Jain, C.**, Paul, B. & Maitra, C., 2011, ATel 3785

#### **CONFERENCE/SYMPOSIUM PAPER/ POSTER PRESENTATION**

- Paper at the ASTROSAT Workshop on "Study of Emission from Hot Diffuse Gas with ASTROSAT", held in December 2006
- Poster at the Conference on "Wideband X-ray Astronomy: Frontiers in Timing and Spectroscopy", held in January, 2011
- Paper at 35th Astronomical Society of India, held in March 2017
- Paper at "National Conference on Recent Trends in the Study of Compact Objects: Theory and Observation (RETCO - III)" held in June 2017
- Poster at the National Science Day celebration organized by Indian National Science Academy on 28th February 2018

#### **PUBLICATIONS (Other than research article)**

##### **1) Book**

*'Principles of Electromagnetic Theory'*, Narosa Publishing House, ISBN: 978-81-8487-600-0

##### **2) E-lessons for Virtual Learning Environment, Institute of Life Long Learning, University of Delhi ISSN 2349-154X**

- Magnetic Force
- Magnetic parameters in matter, magnetization, magnetic field, susceptibility, permeability

- B-H Curve , hysteresis
- Basic Theory of Ballistic Galvanometer
- Basic parameters associated with the Ballistic Galvanometer
- Conservation of energy, momentum and angular momentum of electromagnetic fields
- For 'Quantum Mechanics and Nuclear Physics' (B. Sc. (H) Physics II year (Paper XII))

**3) Reviewer for Virtual Learning Environment, Institute of Life Long Learning, University of Delhi ISSN 2349-154X**

- MCQ on Mechanics (B. Sc. (H) Physics I year, Old 3-year Course)
- MCQ on Complex variables and Applications (B. Sc. (H) Physics II year, Old 3-year Course)

---

**RESEARCH GUIDANCE**

**Ph. D. SUPERVISION**

One student is pursuing his Ph. D. under my supervision at the Department of Physics and Astrophysics, University of Delhi

**SUPERVISION OF UNDER-GRADUATE PROJECTS**

**Academic Year, 2017 - 2018**

- DBT Sponsored Interdisciplinary Project on 'Estimation of Sugar Content'
- DBT Sponsored Project on 'Magnetic Hysteresis'

**Academic Year, 2016 – 2017**

- DBT Sponsored Interdisciplinary Project on 'Finding dielectric constant of glass'
- DBT Sponsored Project on 'Study of RC network response'
- DBT Sponsored Project on 'Construction of basic function generator'

**Academic Year, 2015 – 2016**

- DBT Sponsored Project on 'Theory of Errors'

**Academic Year, 2013 – 2015**

- PI of Innovation Project on 'Understanding the physical and geometrical behaviour of differential equations and its applicability to the real world'. Sponsored by Delhi University.

---

**TEACHING EXPERIENCE**

---

**SUBJECTS TAUGHT (at under-graduate level)**

- Applied Quantum Mechanics
- Astronomy and Astrophysics
- Electricity and Magnetism
- Electromagnetic Theory
- Mathematical Physics
- Nuclear and Particle Physics
- Thermal Physics
- Waves and Optics
- Wave Propagation and Antenna

**ADMINISTRATIVE ASSIGNMENTS (at Hansraj College and University of Delhi)**

---

**Academic Year, 2020 - 2021**

- Secretary: Hansraj College Alumni Association
- Convener: Under-graduate admissions of B.Sc. (H) Geology
- Convener: Lumen - Physics and Electronics Society for student's activities
- Deputy Coordinator: Community College, Hansraj College Centre, UGC
- Department Coordinator: Star College Scheme of the Department of Biotechnology
- Member: Department Infrastructure Committee
- Member: Women Development Cell
- Member: Environment Awareness Committee

**Academic Year, 2019 - 2020**

- Secretary: Hansraj College Alumni Association
- Convener: Portal and ICT Enabling Committee of the College
- Convener: Workload Committee (Science) of the College
- Department Coordinator: Star College Scheme of the Department of Biotechnology
- Member: Department Infrastructure Committee
- Member: Steering Committee of Department of Physics and Astrophysics for the LOCF based Under-graduate Course Revision
- Member: Sub-committee of Committee of Courses, Department of Physics and Astrophysics, University of Delhi

**Academic Year, 2018 - 2019**

- Secretary: Hansraj College Alumni Association
- Convener (Science) for Mentorship Program of the College
- Convener: Department Infrastructure Committee
- Department Coordinator: Star College Scheme of the Department of Biotechnology
- Member: Canteen Committee
- Member: Garden Committee
- Member: Portal and ICT Enabling Committee
- Member: Department Timetable Committee
- Member: Steering Committee of Department of Physics and Astrophysics for the Under-graduate Course Revision
- Member: Sub-committee of Committee of Courses, Department of Physics and Astrophysics, University of Delhi

**Academic Year, 2017 - 2018**

- Convener: Timetable Committee (Science)
- Convener (Science) for Mentorship Program of the College
- Convener: Department Library Committee
- Department Coordinator: Star College Scheme of the Department of Biotechnology
- Member: Portal and ICT Enabling Committee
- Member: Department Infrastructure Committee
- Member: Department Purchase Committee
- Member: Sub-committee of Committee of Courses, Department of Physics and Astrophysics, University of Delhi

**Academic Year, 2016 - 2017**

- Convener: Timetable Committee (Science)
- Convener: Department Admission Committee

- Department Coordinator: Star College Scheme of the Department of Biotechnology
- Member: Environment Awareness Committee
- Member: Department Infrastructure Committee
- Member: Sub-committee of Committee of Courses, Department of Physics and Astrophysics, University of Delhi

**Academic Year, 2015 - 2016**

- Deputy Coordinator, Central Evaluation Centre for November-December 2015 Theory Examination
- Department Coordinator: Star College Scheme of the Department of Biotechnology
- Secretary: Staff Association
- Member: Student's Welfare and Discipline Committee
- Member: Garden Committee
- Member: Department Purchase Committee
- Member: Department Infrastructure Committee
- Member: Sub-committee of Committee of Courses, Department of Physics and Astrophysics, University of Delhi

**Academic Year, 2014 - 2015**

- Convener: Canteen Committee
- Superintendent of University Practical Examination (November – December 2014)
- Deputy Superintendent University Theory Examinations (May - June 2015)
- Department Coordinator: Star College Scheme of the Department of Biotechnology
- Member: Academic Affairs and Seminar Committee
- Member: Department Timetable Committee
- Member: Department Infrastructure Committee

**Academic Year, 2013 - 2014**

- Convener: Lumen - The Physics and Electronics Society for student's activities
- Convener: Under-graduate Admissions in B.Sc. (H) Physics
- Department Coordinator: Star College Scheme of the Department of Biotechnology
- Member: Student's Welfare Committee

**Academic Year, 2012 - 2013**

- Convener: Under-graduate Admissions in B.Sc. (H) Physics
- Member: Student's Welfare Committee
- Member: Environment Awareness Committee
- Member: Department Infrastructure Committee
- Member: Department Purchase Committee

**Academic Year, 2011 - 2012**

- Convener: Department Infrastructure Committee
- Convener: Lumen - The Physics and Electronics Society for student's activities
- Member: Department Timetable Committee (even semester)

**Academic Year, 2010 - 2011**

- Convener: Lumen - The Physics and Electronics Society for student's activities

---

**OUTREACH ACTIVITY AS RESOURCE PERSON**

- DBT sponsored workshop on 'Applications of Lasers in Biotechnology' held in Hansraj College from 16-12-2013 to 17-12-2013

- DBT sponsored workshop on 'Functional analysis and troubleshooting of Electronic Devices for Biotechnology and Biomedical applications' held in Hansraj College from 12-03-2014 to 14-03-2014
- Physics workshop on 'Experiments – The Challenges and Opportunities', organized by Kulachi Hansraj Model School, Delhi on 27-09-2014.
- DBT sponsored workshop on 'Workshop on Integrating ICT in Teaching and Learning' held in Hansraj College from 11-12-2015 to 18-12-2015.
- TGT Teachers Training at BBPS Training Centre, Bal Bharati Public School, Pitampura, Delhi on May 25, 2017.
- DU Pre-Entrance Summer School, for students from backward and economically weaker sections (EWS) organized by ILLU, University of Delhi from 07-06-2017 to 22-06-2017
- DU-Pre Entrance Summer School, for students from backward and economically weaker sections (EWS) organized by ILLU, University of Delhi from 01-06-2018 to 16-06-2018
- PEP Physics Workshop for PGT Teachers of Class XI and XII, Kulachi Hansraj Model School, Delhi on 07-07-2018
- Workshop on 'Development of Video Guide on the use of Upper primary Science Kit in Division of Educational Kits', NCERT, Delhi from 14-01-2019 to 18-01-2019.
- Workshop on 'Development of Video Guide on the use of Upper primary Science Kit in Division of Educational Kits', NCERT, Delhi from 11-02-2019 to 15-02-2019.
- Workshop on 'Revision of Specification of Kit items (Science and Mathematics)', NCERT, Delhi from 02-09-2019 to 06-09-2019.
- Workshop on 'Revision of Specification of Kit items (Science and Mathematics)', NCERT, Delhi from 16-09-2019 to 20-09-2019.
- Workshop on 'Development of Manuscript of Video Guide on the use of Secondary Science Kit', NCERT, Delhi from 17-02-2020 to 28-02-2020.
- National Webinar on 'Cosmological Ladder', organized by Rajapalayam Rajus' College on 23-06-2020
- Academic Counsellor at IGNOU since September 2020
- National Webinar on 'Frontiers in Astrophysics', organized by Bishop Heber College on 12-11-2020
- National Webinar on 'A glimpse of X-ray data analysis', organized by Nehru Planetarium, Delhi in National Science Day 28th February 2021. It can be accessed through the link.  
[X-ray Data Analysis](#) (1:15:58 onwards)

#### **ORGANIZATION OF VARIOUS PROGRAMMES (at Hansraj College and University of Delhi)**

##### **WORKSHOP**

- 'Applications of Lasers in Biotechnology' during 16<sup>th</sup> – 17<sup>th</sup> December 2013
- 'Functional analysis and troubleshooting of Electronic Devices for Biotechnology and Biomedical applications' during 12<sup>th</sup> – 14<sup>th</sup> March, 2014
- 'Fluorescence Studies of Organic Structures' during 26<sup>th</sup> – 27<sup>th</sup> September 2014
- 'Integrating ICT in Teaching and Learning' during 11<sup>th</sup> – 18<sup>th</sup> December 2015
- 'Embedded systems' during 15<sup>th</sup> – 16<sup>th</sup> January 2016
- 'Basic Blood and Biochemical Parameters of Human Health' on 07<sup>th</sup> September 2017
- 'Introduction to SciLab' during 22<sup>nd</sup> – 23<sup>rd</sup> September 2017
- 'Physics Unplugged' on 13<sup>th</sup> February 2021



- 'Social Networking : The Gen Z Power Recruitment Tool' on 27<sup>th</sup> – 28<sup>th</sup> February 2021, under the Mahatma Hansraj Faculty Development Centre of Hansraj College

### **SUMMER SCHOOL**

- Deputy Coordinator for the "DU Pre-Entrance Summer School" for students from backward and economically weaker sections (EWS) organized by ILL, University of Delhi during 07<sup>th</sup> – 22<sup>nd</sup> June 2017

### **Faculty Development/Induction Programmes**

- 'Embedded systems and synthesis of nano-materials' during 06<sup>th</sup> – 07<sup>th</sup> January 2017
- 'Digital Literacy: An Introduction to ICT Skills' during 15<sup>th</sup> – 17<sup>th</sup> September 2017
- One Week in 'Faculty Induction Program' during 17<sup>th</sup> June to 16<sup>th</sup> July 2019

### **SEMINAR**

- 'Chandershekhar: His quest for beauty and Truth in Astrophysics', by Prof Patrick Das Gupta on 22<sup>nd</sup> February 2011
- 'Application of semiconductors as sensor/sensing devices in medical sciences' by Prof. Vinay Gupta on 12<sup>th</sup> February 2013
- 'Renewable energy sources and importance of solar photo and voltaic' by Dr P. K. Singh from National Physical Laboratory, Delhi on 05<sup>th</sup> September 2013
- 'DNA biosensor for diagnosis of diseases' by Dr Ashok Kumar of IGIB CSIR on 25<sup>th</sup> January 2014
- 'Physics of Stars' by Prof T. R. Seshadri on 01<sup>st</sup> April 2016
- 'Management Skills in Office Administration – Practices and Advances' on 22<sup>nd</sup>–23<sup>rd</sup> November 2016
- 'Radiation Hazards and Monitoring: Techniques and Materials' by Prof. P. D. Sahare on 10<sup>th</sup> April 2017

### **WEBINAR**

- 'Observing the wonder world using fluorescence spectroscopy and microscopy' by Dr Sobhan Sen on 11<sup>th</sup> May 2020
- 'Challenges, Opportunities and the Way forward for Entrepreneurs & Startups in the Present Times' by Sh. Rajiv Chawla on 19<sup>th</sup> July 2020
- 'Women Entrepreneurship' by Ms. Richa Pandey Mishra on 23<sup>rd</sup> August 2020
- 'Aerial Robotics and Unmanned Systems' by Lt. Cdr. John Livingstone on 10<sup>th</sup> October 2020
- 'Research and Innovation at Undergraduate Level' by Prof. Pankaj Tyagi on 25<sup>th</sup> February 2021

### **ONLINE COMPETITION**

- 'Covid-19: Awareness Program' during 13<sup>th</sup> – 18<sup>th</sup> May 2020

### **ONLINE COURSE**

- 'Introduction to Machine Learning for Physics and Electronics' during 01<sup>st</sup> – 15<sup>th</sup> August 2020

### **MEMBER OF ORGANIZING COMMITTEE**

- 'National Conference on Advanced materials: Theory and Applications', organized by Hansraj College, University of Delhi during 26-28 September 2019.



### **EDUCATIONAL VISIT**

- Students' educational visit to National Physical Laboratory (NPL) on 27th September 2013

### **COMPUTATIONAL SKILLS**

- Operating systems: UNIX/LINUX, WINDOWS
- Proficient in programming with modern fortran, basic fortran, C++
- Scientific computation and data analysis in Matlab and Python
- Expertise in Shell scripting, latex, MS Office

**Dr. Chetana Jain**  
**Department of Physics**  
**Hansraj College, University of Delhi**