

Curriculum Vitae

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Professional Experience

01/09/2023 – present: Post doctoral researcher; Instituto de Astrofísica de Canarias (Spain); member of [“Whole Sun” project under ERC synergy grant in Astrophysics](#)

25/09/2021 – 15/08/2023: Post doctoral researcher; KU Leuven (Belgium).

29/09/2020 – 15/09/2021: Research Associate; Aryabhata Research Institute of Observational Sciences (India).

Academic Education

07/2014 – 08/2020: Ph.D. in Astrophysics; Indian Institute of Astrophysics (Affiliated by Pondicherry University), India; Thesis Title: “Twisted magnetic Flux tubes in the Sun”; Supervisor: Prof. A. Mangalam.

07/2012 – 07/2014: Masters in Science (in Physics), Indian Institute of Technology (Madras), India.

07/2009 – 07/2012: Bachelors in Science (Specialization in Physics, with Mathematics and Chemistry as minors), University of Calcutta, India.

Publications

Summary: Total number of publications: **10**.

In refereed peer-review journals – **8**, with **6** as **first author** (3 featured in press and media release), **2** as a co-author (second in the author list for both the publications).

Conference proceedings as **first author** – **2**.

List of Publications

Peer-reviewed Journal

- De Jonghe, J. and **Sen, Samrat** (2025): “The coupled tearing-thermal instability in coronal current sheets from the linear to the non-linear stage”, [MNRAS, 336, 3308](#)
- Nayak, S., **Sen, Samrat**, Shrivastav, A., Bhattacharyya, R., Athiray, P.S. (2024): “Exploring the magnetic and thermal evolution of a coronal jet”, [ApJ, 975, 143](#)
- **Sen, Samrat**; Prasad, A.; Liakh, V.; Keppens, R. (2024): “From eruptions to post-flare rain: a 2.5D MHD model”, [A&A 688, 64](#).
- **Sen, Samrat**; Jenkins, J.; Keppens, R. (2023): “3D coupled tearing-thermal instability in solar current sheet”, [A&A, 678, 132](#).
- **Sen, Samrat**; Keppens, R., (2022): “Thermally enhanced tearing in solar current sheets: Explosive reconnection with plasmoid-trapped condensations”, [A&A 666, A28](#).
- **Sen, Samrat & Pant, V.** (2021): “How Does transverse MHD wave-driven turbulence influences the

density filling factor in the solar corona? [ApJ, 923:178.](#)

• **Sen, Samrat & Mangalam, A.** (2019): Open and Closed Magnetic Configurations of Twisted Flux Tubes; [ApJ, 877, 127.](#)

• **Sen, Samrat & Mangalam, A.** (2018): Model of a flux tube with twisted magnetic field in a stratified solar atmosphere; [AdSpR, 61, 617.](#)

Conference proceedings

• **Sen, Samrat & Mangalam, A.** (2018): Flux tube model in solar atmosphere; [IAUS 340, 55.](#)

• **Sen, Samrat, Mangalam, A., Ramesh, R.** (2018): Energy distribution of solar flare events; [IAUS 340, 53.](#)

Submitted in peer-review journals

• **Sen, Samrat, Moreno-Insertis, F.** (2025): “Magnetic and thermodynamic evolution of merging plasmoids in coronal current sheet”, under review in *A&A*.

Press release and popular science articles:

• Scientists develop a new model for inferring density inhomogeneity in the solar corona; [Press release](#)

• Unveiling the multi-thermal nature in solar current sheet; [Press release](#)

• When Hot Meets Cold: Multi-Thermal Aspect in a 3D Coupled Tearing Thermal Evolution in a Solar Current Sheet; [News letter release \(page 9\)](#)

• The curious case of the hot solar corona: A150 year old mystery; [Popular science article](#)

• The Mathematics of Music; [Popular science article \(page 40\)](#)

Awards and achievements:

International:

2024: Foreign travel grant for collaborative work visit, offering Institute – University of Sheffield.

2024: Foreign travel grant for collaborative work visit, offering Institute – University of Northumbria.

2020: Foreign travel grant from Royal Society International Exchange, offering Institute – University of Sheffield (*The visit got cancelled due to Covid-19*).

National:

2014: Qualification in National Eligibility Test (NET) for lectureship by “Council of Scientific and industrial research (CSIR)”, **All India rank – 85** (Number of appeared candidates around 23000).

2014: Qualification in Graduate Aptitude Test in Engineering (GATE) in Physics by “Science and Engineering Research Board”, **All India rank – 172** (Number of appeared candidates 6132).

2014: Qualification in Joint Entrance Screening Test (JEST), **All India rank – 472** (Number of appeared candidates around 6000).

2009: Best mathematics student award for securing **100% marks** in mathematics in the inter-state higher secondary board, West Bengal, India.

Invited presentations

03/2023: Tearing Influenced Thermal modes in Solar Current Sheets; The Whole Sun Meeting 2023; Orsay, France.

02/2023: Thermal effect on the Tearing Instability in Solar Current Sheets; Max Planck Institute of

Solar System Research, Gottingen, Germany.

10/2022: Thermally enhanced tearing in solar current sheets: Explosive reconnection with plasmoid-trapped condensations (6th Asia Pacific Conference on Plasma Physics), South Korea (Online).

09/2022: Thermally enhanced tearing in solar current sheets: Explosive reconnection with plasmoid-trapped condensations; Warwick, United Kingdom (Online).

Contributed Oral presentations

06/2024: 11th Coronal loop Workshop – Hot meets Cold: From eruptions to post-flare rain; Tenerife, Spain.

05/2024: Coronal Cooling Conference – Hot meets Cold: From eruptions to post-flare rain; Leuven, Belgium.

03/2024: The Whole Sun meeting 2024 – Hot meets Cold: From eruptions to post-flare rain; Orsay, France.

07/2022: COSPAR 2022 meeting – Exploring the effect of Thermal Instability on tearing mode in the Solar corona; Athens, Greece.

07/2022: Neighborhood Astronomy Meeting (NAM) – Exploring the effect of Thermal Instability on tearing mode in the Solar corona; Warwick, United Kingdom.

09/2021: 16th European Solar Physics Meeting – How Does MHD wave Driven Turbulence influence the Density filling factor in the Solar Corona; Virtual.

04/2018: Neighbourhood Astronomy Meeting (NAM) – Magnetohydrostatic Equilibria of Twisted Flux tubes; Bangalore, India.

02/2018: Dynamic Sun II – Magnetohydrostatic Equilibria of Twisted Flux Tubes; Angkor Wat, Cambodia.

Contributed Poster presentations

02/2023: RoCMI conference – Tearing Influenced Thermal modes in Solar Current Sheets; Svalbard, Norway.

02/2018: IAU Symposium 340 – (i) Magnetohydrostatic Equilibria of Flux tubes, (ii) Energy distribution of solar flare events; Jaipur, India.

05/2016: Astronomical Society of India – Model of a flux tube with twisted magnetic field; Kashmir, India.

02/2016: Dynamic Sun I – Model of a flux tube with twisted magnetic field; Varanasi, India.

Organisation of Scientific Meetings/Workshops

10/2024: [The Whole Sun Meeting, 2024](#) (Local Organising Committee).

11/2020: Organising workshop to demonstrate the application of *Mathematica* for scientific research at Aryabhata Research Institute of Observational Sciences (Nainital, India).

Referee

- Frontiers of Astronomy and Space Science (FrASS) journal.
- The Astrophysical Journal (ApJ).

Public Outreach

2015-2020: Science outreach program at Indian Institute of Astrophysics, (Bangalore, India).

2020-2021: Science outreach program at Aryabhata Research Institute of Observational Sciences (Nainital, India).

Role in the outreach activity: Science outreach program – demonstrating elementary science experiments, organising science quiz for school students, and increasing the public awareness about eclipse related superstitions in India.