

Publications on May 2024

Multidisciplinary Special Collection "Space Weather"

Space Weather Events of 2024 May 9-15

[https://agupubs.onlinelibrary.wiley.com/doi/toc/10.1002/\(ISSN\)1542-7390.EVENTSMAY24](https://agupubs.onlinelibrary.wiley.com/doi/toc/10.1002/(ISSN)1542-7390.EVENTSMAY24)

A special issue [Advances in Space Research](#)

The Powerful Solar-Terrestrial and Space Weather Event in May 2024 – Observations, Data and Preliminary Analysis

Edited by Peggy Ann Shea

<https://www.sciencedirect.com/journal/advances-in-space-research/vol/76/issue/12>

Journal of Space Weather and Space Climate

Topical Issue - Severe space weather events of May 2024 and their impacts

<https://www.swsc-journal.org/component/toc/?task=topic&id=2274>

On the features of great Forbush effect during May 2024 extreme geomagnetic storm

M. A. [Abunina](#), [N. S. Shlyk](#), [A. V. Belov](#), [S. M. Belov](#), [A. A. Abunin](#)

Advances in Space Research [Volume 76, Issue 12](#), 15 December 2025, Pages 7578-7586, 2025

<https://arxiv.org/pdf/2501.08029>

<https://doi.org/10.1016/j.asr.2025.03.007>

<https://www.sciencedirect.com/science/article/abs/pii/S027311772500225X>

Pinching of ICME Flux Rope: Unprecedented Multipoint Observations of Internal Magnetic Reconnection during Gannon's Superstorm

Shibotosh [Biswas](#), [Ankush Bhaskar](#), [Anil Raghav](#), [Ajay Kumar](#), [Kalpesh Ghag](#), [Smitha V. Thampi](#), [Vipin K Yadav](#)

ApJL 2025

<https://arxiv.org/pdf/2509.00577>

The Probability of the May 2024 Geomagnetic Superstorm

S. [Elvidge](#), [D. R. Themens](#)

Space Weather [Volume 23, Issue 1](#) January 2025 e2024SW004113

<https://doi.org/10.1029/2024SW004113>

<https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2024SW004113>

Mother's Day Superstorms: Pre- and Post-storm Evolutionary Patterns of ARs 13664/8

Mausumi [Dikpati](#), Marianna B. Korsós, Aimee A. Norton, Breno Raphaldini, Kiran Jain, Scott W.

McIntosh, Peter A. Gilman, Andre S. W. Teruya, and Nour E. Raouafi

2025 ApJ 988 108

<https://iopscience.iop.org/article/10.3847/1538-4357/add09/pdf>

[HMI Science Nuggets](#) #217 2025 <http://hmi.stanford.edu/hminuggets/?p=4460>

[A Canadian perspective on the May 2024 space weather event](#)

Robyn A. D. [Fiori](#), Ljubomir Nikolić, Lidia Nikitina, Taylor G. Cameron, Kyle Reiter, David H. Boteler

and Nathan Olfert

J. Space Weather Space Clim. **2025**, 15, 43

<https://www.swsc-journal.org/articles/swsc/pdf/2025/01/swsc250051.pdf>

Artificial Intelligence Could Have Predicted All Space Weather Events Associated with the May 2024 Superstorm

Sabrina **Guastavino**, [Edoardo Legnaro](#), [Anna Maria Massone](#), [Michele Piana](#)

2025 *ApJ* **985** 53

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Supersubstorms during the May 2024 superstorm

Rajkumar **Hajra**, Bruce T. Tsurutani, Quanming Lu, Aimin Du and Gurbax S. Lakhina

J. Space Weather Space Clim. **2025**, 15, 51

<https://www.swsc-journal.org/articles/swsc/pdf/2025/01/swsc250050.pdf>

Interplanetary Causes and Impacts of the 2024 May Superstorm on the Geosphere: An Overview

Rajkumar **Hajra**, [Bruce Tsatnam Tsurutani](#), [Gurbax Singh Lakhina](#), [Quanming Lu](#), [Aimin Du](#)

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The Solar and Geomagnetic Storms in May 2024: A Flash Data Report

Hisashi **Hayakawa**, [Yusuke Ebihara](#), [Alexander Mishev](#), [Sergey Koldobskiy](#), [Kanya Kusano](#), [Sabrina Bechet](#), [Seiji Yashiro](#), [Kazumasa Iwai](#), [Atsuki Shinbori](#), [Kalevi Mursula](#), [Fusa Miyake](#), [Daikou Shiota](#), [Marcos V. D. Silveira](#), [Robert Stuart](#), [Denny M. Oliveira](#), [Sachiko Akiyama](#), [Kouji Ohnishi](#), [Yoshizumi Miyoshi](#)

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3D fast-mode Wave Propagation from Corona to Chromosphere: Triggering Mechanism for 3D Oscillations of filaments

Yunxue **Huang**, [Qin Feng](#), [Yuhu Miao](#), [Zhining Qu](#), [Ke Yu](#), [Hongfei Liang](#), [Yu Liu](#), [Xinping Zhou](#)

ApJ **2025**

<https://arxiv.org/pdf/2507.14837> 11May 2014

HOPE (hot onset precursor event) during high activity

Hugh **HUDSON**, Alphonse STERLING

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Modeling the Magnetic Connection from Earth to Solar Corona during the May 11 Geomagnetic Superstorm

Alessandro **Ippolito**, Tommaso Alberti, and Fabio Giannattasio

2025 *ApJ* 979 146

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Estimating early coronal mass ejection propagation direction with DIRECD during the severe May 8 and follow-up June 8, 2024 events

[Shantanu Jain](#), [Tatiana Podladchikova](#), [Astrid M. Veronig](#), [Galina Chikunova](#), [Karin Dissauer](#), [Mateja Dumbovic](#), [Amaia Razquin](#)

A&A 683, A15 **2024**

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Magnetic Field Evolution of the Solar Active Region 13664

[Robert Jarolim](#), [Astrid Veronig](#), [Stefan Purkhart](#), [Peijin Zhang](#), [Matthias Rempel](#)
ApJ 2024
<https://arxiv.org/pdf/2409.08124>

Deconstructing Solar Super Active Region 13664 in the Context of the Historic Geomagnetic Storm of 2024 May 10-11

[Priyansh Jaswal](#), [Suvadip Sinha](#), [Dibyendu Nandy](#)
2025 ApJ 979 31
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The M- and X-class White-light Flares in Super Active Region NOAA 13664/13697 Observed by ASO-S/LST/WST

[Zhichen Jing](#), [Ying Li](#), [Jingwei Li](#), [Qiao Li](#)
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Evolution of interacting coronal mass ejections driving the great geomagnetic storm on 10 May 2024

[Soumyaranjan Khuntia](#), [Wageesh Mishra](#), [Anjali Agarwal](#)
A&A 698, A79 2025
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<https://www.aanda.org/articles/aa/pdf/2025/06/aa52866-24.pdf> File
Table 1. The list of responsible CMEs causing the great geomagnetic storm on 10 May 2024.

Near-continuous tracking of solar active region NOAA 13664 over three solar rotations

I. [Kontogiannis](#) (1 and 2), [Y. Zhu](#) (1), [K. Barczynski](#) (3), [M. Z. Stiefel](#) (1 and 4), [H. Collier](#) (1 and 4), [J. McKevitt](#) (5 and 6), [J.S. Castellanos Durán](#) (7), [S. Berdyugina](#) (2 and 8), [L.K. Harra](#) (1 and 3)
A&A 2025
<https://arxiv.org/pdf/2510.05979>

The extremely strong non-neutralized electric currents of the unique solar active region NOAA 13664

Ioannis [Kontogiannis](#) (Leibniz-Institut für Astrophysik Potsdam (AIP) Germany)
A&A 690, L10 2024
<https://www.aanda.org/articles/aa/pdf/2024/10/aa51627-24.pdf>
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Tracing Magnetic Signatures through the Solar Atmosphere in Seven Eruptive Active Regions

Marianna B. [Korsós](#), Ioannis Kontogiannis, Daria Shukhobodskaya, Luciano Rodriguez, Fabiana Ferrente, and Francesca Zuccarello
2025 ApJ 990 121
<https://iopscience.iop.org/article/10.3847/1538-4357/adf2a7/pdf>

Unveiling the Interplanetary Solar Radio Bursts of the 2024 Mother's Day Solar Storm

Oksana [Kruparova](#)^{1,2}, Vratislav Krupar^{1,2}, Adam Szabo², David Lario², Teresa Nieves-Chinchilla², and Juan Carlos Martinez Oliveros³
2024 ApJL 970 L13
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Dynamics of Subsurface Flows in Solar Active Regions During the May 2024 Storm

[B Lekshmi](#), [Sushanta Tripathy](#), [Kiran Jain](#), [Alexei Pevtsov](#)
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A Novel Fine Spectral Structure of Solar Radio Bursts with Periodic Beaded Stripes Observed by CBSm of CMP-II

[Chuanyang Li](#), [Yao Chen](#), [Bing Wang](#), [Ze Zhong](#), [Baolin Tan](#), [Zongjun Ning](#), [Hao Ning](#), [Xiangliang Kong](#), [Shuwang Chang](#), [Yanke Tang](#), [Ning Gai](#), [Li Deng](#), [Jingye Yan](#), [Fabao Yan](#)

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Exploring the origin of multi-periodic pulsations during a white-light flare

[Dong Li](#), [Ding Yuan](#), [Jingye Yan](#), [Xinhua Zhao](#), [Zhao Wu](#), [Jincheng Wang](#), [Zhenyong Hou](#), [Chuan Li](#), [Haisheng Zhao](#), [Libo Fu](#), [Lin Wu](#), [Li Deng](#)

JGR 2025

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Various Features of the X-class White-light Flares in Super Active Region NOAA 13664

[Ying Li](#), [Xiaofeng Liu](#), [Zhichen Jing](#), [Wei Chen](#), [Qiao Li](#), [Yang Su](#), [De-Chao Song](#), [M. D. Ding](#), [Li Feng](#), [Hui Li](#), [Weiqun Gan](#)

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A Pileup of Coronal Mass Ejections Produced the Largest Geomagnetic Storm in Two Decades

Ying D. [Liu](#), [Huidong Hu](#), [Xiaowei Zhao](#), [Chong Chen](#), [Rui Wang](#)

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The magnetic topology of AR13664 leading to its first halo CME

[David MacTaggart](#), [Tom Williams](#), [OPM Aslam](#)

JGR Volume 130, Issue 4 e2024JA033462 2024

<https://arxiv.org/pdf/2410.15964>

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Energy-Dependent SEP Fe/O Abundances During the May 2024 Superstorm

G. D. [Muro](#), [C. M. S. Cohen](#), [Z. Xu](#), [R. A. Leske](#), [A. C. Cummings](#), [S. Bale](#), +++

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Evaluating the Geomagnetic Response to the May 2024 Super Storm – Observations and Interpretations

[Chigomezoyo M. Ngwira](#), et al.

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Editorial: Impacts of the extreme Gannon geomagnetic storm of May 2024 throughout the magnetosphere-ionosphere-thermosphere system

Denny M. [Oliveira](#)^{1,2*}, Mirko Piersanti^{3,4,5}, Maria-Theresia Walach⁶, Livia R. Alves⁷, W. Kent Tobiska⁸, Xochitl Blanco-Cano⁹ and Katariina Nykyri¹⁰

Front. Astron. Space Sci., Volume 12 - 2025 | 12:1742847.

<https://doi.org/10.3389/fspas.2025.1742847>

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Magnetic interaction analysis of multiple interplanetary coronal mass ejections leading to a historic geomagnetic storm in May 2024

Sanchita **Pal**, [Cecilia Mac Cormack](#), [Emilia K. J. Kilpua](#), [Yogesh](#), [Lan K. Jian](#), [Teresa Nieves-Chinchilla](#)
A&A 702, A150 2025
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The high-energy protons of the ground level enhancement (GLE74) event on 11 May 2024

A. **Papaioannou**, [A. Mishev](#), [I. Usoskin](#), [B. Heber](#), [R. Vainio](#), [N. Larsen](#), [M. Jarry](#), [A.P. Rouillard](#), [N. Talebpour Sheshvan](#), [M. Laurenza](#), [M. Dumbović](#), [G. Vasalos](#), [J. Gieseler](#), [S. Koldobskiy](#), [O. Raukunen](#), [C. Palmroos](#), [M. Hörlock](#), [M. Köberle](#), [R. F. Wimmer-Schweingruber](#), [A. Anastasiadis](#), [P. Kühl](#), [E. Lavasa](#)
Solar Phys. 300, 73 2025
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Satellite Drag Analysis During the May 2024 Geomagnetic Storm

William E. **Parker**¹ and Richard Linares 2
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SUPERSTORM ZAPS GLOBAL ELECTRIC CIRCUIT

See <https://www.spaceweather.com> for 18 Jun 2024

Capability of Revised Intensity and Impulsive Strength of Geomagnetic Storms and Activities to Identify Severe Space Weather

Jijin K. **Raj**, [V. Manu](#), [N. Balan](#), [Qing-He Zhang](#), [Zan-Yang Xing](#)
[Space Weather](#) Volume 23, Issue 7 e2025SW004399 2025
<https://doi.org/10.1029/2025SW004399> 10-11 May 2024

Super-Intense Geomagnetic Storm on 10–11 May 2024: Possible Mechanisms and Impacts

S. Tulasi **Ram**, [B. Veenadhari](#), [A. P. Dimri](#), [J. Bulusu](#), [M. Bagiya](#), [S. Gurubaran](#), [N. Parihar](#), [B. Remya](#), [G. Seemala](#), [Rajesh Singh](#), [S. Sripathi](#), [S. V. Singh](#), [G. Vichare](#)
[Space Weather](#) Volume 22, Issue 12 December 2024 e2024SW004126
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Coronal dimmings from active region 13664 during the May 2024 solar energetic events

Amaia **Razquin**, [Astrid M. Veronig](#), [Karin Dissauer](#), [Tatiana Podladchikova](#), [Shantanu Jain](#)
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Table A.1: Flare list (M- and X-class) of AR 13664 from May 1 to 15, 2024

Observation and modeling of complex transient structure in heliosphere followed by geomagnetic storm on May 10-11, 2024

Denis **Rodkin**, [Vladislav Lukmanov](#), [Vladimir Slemzin](#), [Igor Chashei](#)
[Advances in Space Research](#) Volume 76, Issue 12, 15 December 2025, Pages 7230-7240
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Comparing observations of the closely located JUICE and STEREO-A spacecraft during the widespread solar energetic particle event of 2024 May 13

L. [Rodríguez-García](#), [E. Palmerio](#), [M. Pinto](#), [N. Dresing](#), [C. M. S. Cohen](#), [R. Gómez-Herrero](#), [J. Gieseler](#), [F. Santos](#), [F. Espinosa Lara](#), [I. Cernuda](#), [M. Mewes](#), [C. Vallat](#), [O. Witasse](#), [N. Altobelli](#)
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Analyzing the Sequence of Phases Leading to the Formation of the Active Region 13664, with Potential Carrington-like Characteristics

[Paolo Romano](#), [Abouazza Elmhamdi](#), [Alessandro Marassi](#), [Lidia Contarino](#)
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The impact of the Gannon Storm of May 2024 on the radiation fields at aviation altitudes and in low earth orbits **SEP data**

[Kai Schennetten*](#) [Daniel Matthiä](#) [Matthias M. Meier](#) [Thomas Berger](#) Michael Wirtz
Front. Astron. Space Sci. , Volume 11 - 2024
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Flare energetics, CME launch and heliospheric propagation for the May 2024 events, as derived from ensemble MHD modelling

[Brigitte Schmieder](#), [Jinhan Guo](#), [Guillaume Aulanier](#), [Anwesha Maharana](#), [Stefaan Poedts](#)
Solar Phys. 300, 132 2025
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Extraordinary Magnetic Flux Emergence Rate Preceding the May 2024 Extreme Geomagnetic Disturbances

Xudong [Sun](#)¹, Aimee Norton², Shin Toriumi³, Peter Schuck⁴, Jie Zhang
[HMI Science Nuggets](#) #4216 June 2024
<http://hmi.stanford.edu/hminuggets/?p=4216>
Evolution of AR3664 [movie of NOAA 13664/8 flux emergence](#)

Some Interesting Observations of Cosmic Ray Variations during the Extreme Solar Storm on 2024 May 10–11

Pranali [Thakur](#) and Geeta Vichare
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Simulating the Arrival of Multiple Coronal Mass Ejections That Triggered the Gannon Superstorm on 2024 May 10

Smitha V. [Thampi](#), Ankush Bhaskar, Prateek Mayank, Bhargav Vaidya, and Indu Venugopal
2025 ApJ 981 76
<https://iopscience.iop.org/article/10.3847/1538-4357/ada93c/pdf>
Tables_CMEs of 8-10 May 2024

Observations of the 2024 May 14 X8.7 Solar Flare with the Goldstone-Apple Valley Radio Telescope (GAVRT)

Thangasamy [Velusamy](#)¹, Ryan Dorcey², Nancy Kreuser-Jenkins², Lisa Nichole Lamb², Erica Pagano², Marin M. Anderson¹, Joseph Lazio¹, and Steven Levin¹
2024 Res. Notes AAS 8 163
<https://iopscience.iop.org/article/10.3847/2515-5172/ad5a0d>

Time-evolving coronal modelling of solar maximum around the May 2024 storm by COCONUT

Haopeng **Wang**, [Stefaan Poedts](#), [Andrea Lani](#), [Luis Linan](#), [Tinatin Baratashvili](#), [Fan Zhang](#), [Daria Sorokina](#), [Hyun-jin Jeong](#), [Yucong Li](#), [Najafi-Ziyazi Mahdi](#), [Brigitte Schmieder](#)
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Unveiling key factors in solar eruptions leading to the solar superstorm in 2024 May

Rui **Wang**^{1,2,3*}, Ying D. Liu^{1,2,3}, Xiaowei Zhao^{4,5} and Huidong Hu^{1,2}

A&A 692, A112 (2024)

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First Observations of a Geomagnetic Superstorm With a Sub-L1 Monitor

E. **Weiler**, [C. Möstl](#), [E. E. Davies](#), [A. M. Veronig](#), [U. V. Amerstorfer](#), [T. Amerstorfer](#), [J. Le Louëdec](#), [M. Bauer](#), [N. Lugaz](#), [V. Haberle](#), [H. T. Rüdiger](#), [S. Majumdar](#), [M. Reiss](#)

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Assessment of Geomagnetic Activity for the Kp=9 “Gannon Storm” in May 2024 Based on Version 3.0 Hpo Indices

Yosuke **Yamazaki**, Jürgen Matzka, Marcos Vinicius Siqueira da Silva, Guram N Kervalishvili, ++
ESS Open Archive . June 14, 2024.

<https://essopenarchive.org/doi/full/10.22541/essoar.171838396.68563140/v1>

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Impacts of the May 2024 Extreme Geomagnetic Storm on Global High-Accuracy GPS Positioning Solutions

Zhe **Yang**, [Y. T. Jade Morton](#)

Space Weather Volume 23, Issue 10 e2025SW004547 2025

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The Magnetosphere-Ionosphere-Ground Responses to the May 2024 Super Solar Storm

Zhenxia **Zhang**, [Fang Zhang](#), [Lu Wang](#), [Xinqiao Li](#), [Zeren Zhima](#), +++

Space Weather Volume 23, Issue 4 e2024SW004197 2025

<https://doi.org/10.1029/2024SW004197>

<https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2024SW004197>

Dependence of SYMH Change Rate on Dynamic Pressure during the Main Phases of Storms: A Comparative Analysis of the 2024 May and 2003 November Superstorms

Ming-Xian **Zhao** and Gui-Ming Le

2025 ApJ 978 157

<https://iopscience.iop.org/article/10.3847/1538-4357/ada15c/pdf>