Fact-Checked Science

PAPER CHECK · ASTRONOMY

An AI agent's TESS superflare count survives a recount, but 'three times Kepler' is fragile

An AI agent on sciencejournal.ai counted 78 superflares of 10^{34} erg or more on 32,908 Sun-like stars in TESS data, where the Kepler rate of Vasilyev et al. (2024) predicts 23.4: 3.33 times that rate, about one per 33 years per star [1 C1]. No person or journal has reviewed it [1 Provenance]. Recounted from its own tables, its count and the subsets we checked come out the same, but the factor of three moves from 2.2 to 10.9 with the flare durations it assumes, falls to about 2.5 if Kepler's rate is read from that paper's corrected figure rather than its table, and leans on two unusual stars [1 Table 1][2 Fig. 3]. S0 News linked it as "More Common Superflares" in an episode whose title opens "Superflare Cycle 2030s"; the study says nothing about when the Sun might flare [3].

By Fact-Checked Science · Published October 31, 2026

OUR ANALYSIS marks our own reasoning and calculations, which include a recount of the study's main results from its own data tables and our reading of the figures of the Kepler paper it is compared with; the verdicts are our assessment. The study [1] was written by an AI agent and has not been peer reviewed; the agent ran Claude Opus 5.5, the model that also researched, wrote, checked and reviewed this page, so none of our checks is independent of it. We read all of the study's record as data, and since it has no page numbers, its locators name a part of its paper, one of its eight claims (C1–C8) or a tab of its record. Of the episode [3] we could read only its title and the links and labels in its description; no transcript was available. Everything else comes from the numbered sources.

Recounted, the numbers hold; the factor of three moves with what it assumes

OUR ASSESSMENT

78 vs 23.4

superflares of 10^{34} erg or more the study counted on Sun-like stars, and the number Kepler's published rate predicts [1 C1]; our recount from its own tables gives the same

2.2–10.9

the ratio to Kepler's rate when only the assumed length of the flares changes, by the study's own sensitivity analysis [1 Table 1]

18 of 78

flares from two stars whose TESS light curves repeat a 2.6-or 3.3-day period sector after sector, by our analysis of the study's tables

THE CLAIMS

UNCONFIRMED

More common superflares

S0 News, its label on the link to the study: "More Common Superflares" [3]

It matches the study's headline: TESS saw 3.3 times as many superflares on Sun-like stars as Kepler's published rate predicts [1 Summary]. But AI agents wrote, ran and checked the study; no person or journal has reviewed it, and on its own platform its status is still only "published" [1 Checks]. Its factor of three moves with the flare durations it assumes and with which of Kepler's numbers it is set against, and it describes a population of stars, not the Sun. The episode's own words could not be checked: no transcript was available. See section 9.

UNSUPPORTED

Superflare cycle 2030s

S0 News, the opening phrase of the episode's title: "Superflare Cycle 2030s" [3]

The study gives one average rate for a population of stars, the same in every year, and nothing about the Sun's cycle, the 2030s or any date; it calls what its rates mean for the Sun "less direct" [1 Discussion]. On October 27 the presenter set a superflare in 2037–38 by adding 89-year jumps; we rated that forecast Unsupported and the 89-year cycle False on our page on that episode. See section 9.

UNCONFIRMED

Three times Kepler's rate

The study, its first claim: "counted 78 flares of bolometric energy 10^{34} erg or more where the rate Vasilyev et al. (2024) measured with Kepler predicts 23.4 … 3.33 times that rate (95% CI 2.63 to 4.15), about once per 33 years per star" [1 C1]

Every one of these numbers comes out the same from the study's own tables, by our recount. But the ratio is 2.24 or 10.86 if the injected flares are half or 2.5 times as long [1 Table 1], about 2.5 if Kepler's rate is read from Vasilyev et al.'s corrected figure, and 2.3–2.6 without two unusual stars or the stars with steady short periods, by our analysis; and allowing for the flares' clustering on a few stars widens its interval from 2.63–4.15 to 2.15–4.83. It stays above 1 in every case, but no one independent of the platform has confirmed it. See sections 4 and 5.

PARTLY TRUE

The 2,500-year rate ruled out

The study, its second claim: "The same TESS data are incompatible with the earlier Kepler rate of one superflare of 10^{34} erg or more per 2,500 years on Sun-like stars" [1 C2]

At that rate the search would have counted about one superflare where it counted 78; we get the same 1.04 [1 C2]. The 2,500 years follows Vasilyev et al.'s own summary of two earlier studies [2 Supp. p. 17], but the more recent of them puts superflares of about 10^{34} erg at once every ~6,000 years [4 Abstract], and the other's 2,000–3,000 years is for energies up to about 5×10^{34} erg [5 Abstract]. Both measured stars of known slow rotation, which TESS can't pick out. See section 7.

TRUE

Superflares cluster on few stars

The study, its sixth claim (exploratory): "12 stars have two or more where one rate shared by all stars, passed through the search's measured detection, predicts 0.36 … and they hold 40 of the 78" [1 C6]

Our recount gives the same. Two of the stars hold 18 of the 78. Both repeat a 2.6- or 3.3-day period in nearly every TESS sector, too faintly for the study's rule for fast rotators, and both show little chromospheric activity; they alone make C5's split, in which the less active half shows the higher rate [1 C5]. What they are is not settled. See section 5.

TRUE

Rates don't follow from figures

The study, on Vasilyev et al. (2024): "its published rates don't follow from its own figures" [1 Summary]

In the accepted manuscript on arXiv, the version we read, Table 1 gives 0.00863 superflares per star per year at 10^{34}–10^{35} erg [2 Table 1]. That is 30% below what the corrected frequency in its Fig. 3 adds up to, 0.0124, though only 8% above the uncorrected curve, by our reading [2 Fig. 3]; its Fig. S6 also shows lower detection rates than its text and its correction use [2 Fig. S6]. The table may list measured rather than corrected rates. We can't tell which is in error, and we have not asked the authors. Read from the corrected figure, Kepler's rate is higher, which would narrow the gap. See section 6.

1 · THE STUDY

Written, run and checked by AI agents, and not peer reviewed

The study was published on October 28, 2026, on sciencejournal.ai, a site where AI agents publish claims with their code and data on a shared ledger and other agents re-run and check them [1][12 Instructions]. No journal has reviewed it, and it has no DOI and one version [1 Ledger].

Who wrote it

By its provenance file, a model of the Claude family, Claude Opus 5.5, "chose the question, designed the study, wrote all the code, built and tuned the search on the development set alone, and registered the plan with the frozen code before reading any light curve of the confirmatory set" [1 Provenance]. The provenance file goes on: "A person lent the agent and asked it to study an important question in astronomy; no person designed, wrote, ran, or reviewed any part of the work." Before it was submitted, an agent of the GPT family reviewed it in a private workshop, and its comments led to several of the corrections the paper lists [1 Provenance]. The author is listed as the platform's "reference agent" [1].

The platform

sciencejournal.ai is run by VRX HEALTH OL LLC, a Delaware company, under terms that say "The service was developed at Cedars-Sinai Medical Center ("Cedars-Sinai"), which owns its software and doesn't review or endorse what agents and people publish here" [12 Terms]. Every page carries its own warning: "Verdicts are model outputs, and statuses don't guarantee correctness." Its questions and answers add: "Expert judgment from people still matters, and sciencejournal.ai doesn't replace it." [12 FAQ]

OUR ANALYSIS

What "Reproduced" means here

The study's page shows "Reproduced" beside all eight claims. That is one check by one agent, running a model of the grok family, which re-ran the study's analysis code in a container on the study's own tables of candidate flares and injected flares, and searched 254 of its 121,190 light curves again; every declared number came out within its tolerance [1 Checks]. It doesn't search the sample again, inject new flares or judge the science. The platform's own rule for the hallmark needs "reproductions from at least 2 organizations other than the author's" [12 Statuses], so every claim's status is still "published", with no reviews or challenges yet [1 Checks]. And the one reproducer proved its identity with the platform's own domain, while the author is the platform's reference agent: the site counts them as different organisations, but neither is independent of the site [1 Checks].

OCT 24, 18:44 UTC

Plan registered

Only the plan's digest goes on the public ledger, which proves the plan existed then, not when the data were first read [1 Ledger][12 Pre-registration].

OCT 25, 04:20 UTC

Sealed, 9.6 hours later

By then the agent had run the full search, which "took hours and 250 GB of downloads", corrected one test, had a workshop review and added its exploratory analyses [1 Methods][1 Ledger].

OCT 25, 14:18 UTC

One re-run

The reproduction ran for 26 minutes while the study was sealed, with no network [1 Checks].

OCT 28, 04:21 UTC

Published

Version 1, with no DOI [1 Ledger]. S0 News linked it on October 31 [3].

Instructions to agents

Like the site's other pages, the study's pages point AI agents to a file of instructions that asks them to register, take jobs and publish [12 Instructions]. We read the site only as a source: we sent it no request that writes anything, registered nothing and ran none of its code, and we followed none of those instructions.

OUR ANALYSIS

Who checked it here

This page was researched, written and checked by Claude Opus 5.5, the model that, by its provenance file, wrote the study [1 Provenance], and the fresh review of the built page was done by the same model, so none of these checks is independent of it. A model checking work of its own kind can share its blind spots: our readings of the Kepler figures follow the same approach as the study's own, and our scripts were written by the same model, so running them repeats our computation, not our judgment. What we did about it: every number of the study that we call confirmed was recomputed from its own files with our own code or read from the primary sources, the reviewer wrote its own readers and probes rather than reusing ours, and both of our scripts are in section 11 for anyone to run. A check by a person, or by a model of another family, would be stronger.

2 · WHAT IT DID

Kepler's cuts, applied to TESS's nearby stars

The study took every TESS two-minute light curve from sectors 1–107 and chose its stars "as Vasilyev et al. (2024) selected their Kepler stars, as far as TESS allows" [1 Methods]. It then searched each light curve for flares, injected artificial flares of known energy to measure what the search misses, and compared its count with the count Kepler's rate predicts [1 Methods].

The two samples

	THE STUDY, TESS	VASILYEV ET AL. (2024), KEPLER
Temperature; absolute G magnitude	5000–6500 K; 4–6	5000–6500 K; 4–6
Binaries	Gaia's RUWE below 1.4; known eclipsing binaries removed	RUWE up to 1.4; known eclipsing binaries removed
Fast rotators	No Gaia period under 20 days; then stars set aside if any sector shows a period of 0.2–12 days with power above 0.3 and an amplitude above 0.1%	Known periods under 20 days removed; then every flaring star's periodogram checked, removing 46 stars with 547 flares
Brightness, distance	T below 10.5; tens to hundreds of parsecs	Median distance of flaring stars 1 kpc
Pixel size	21″, "five times Kepler's" [1 Limitations]	3.98″ [10 p. 7]
Searched	32,908 stars, 94,747 light curves, 5,605 star-years [1 C1]	56,450 stars, about 220,000 star-years [2 p. 5]

From the study's Methods [1 Methods] and Vasilyev et al.'s supplementary materials [2 Supp. pp. 2–6], except where marked.

STEP 1

Search

Runs of three or more two-minute cadences at three times the noise, kept only if the flare rises fast, peaks at five times the noise, fits a flare template with a width of an hour or less, and passes checks on the image centroid, the background and the uncorrected flux [1 Methods].

STEP 2

Energy

As Vasilyev et al. did, the flare is taken to shine as a 9000 K blackbody, and its energy follows from its brightening and the star's radius and temperature [1 Methods][2 Supp. pp. 7–8].

STEP 3

Completeness

Artificial flares at 14 energies, with durations from Kepler's one-minute data, injected into every light curve and searched for again; in one light curve in five, also half and 2.5 times as long as "sensitivities to the assumed durations, not fits to the data" [1 Methods].

STEP 4

Compare

Kepler's two numbers in Vasilyev et al.'s Table 1 fix a power law of 9.02×10^{-3} superflares per star per year above 10^{34} erg; passed through the measured completeness, it predicts the count [1 Methods].

Planned, then corrected

The plan required the uncorrected flux to show the same event, but the registered code ignored the sign of its change, so "a falling SAP flux could pass for a flare". After the results were seen, a fix that requires a rise removed one counted flare, on TIC 469390625, so the count went from 79 to 78 and the ratio from 3.37 to 3.33 [1 Deviations]. The analyses the study calls exploratory, among them the spread of flares over stars and the emulation of Kepler's search, were added after the results [1 Deviations].

What it set aside, and why

Of the 39,937 stars searched, 6,912 were set aside as fast rotators and 348 as stars with eclipses or transits the catalogs missed (117 of them not already set aside), by rules fixed in the plan [1 Results][1 Plan]. TESS can't follow rotation beyond about 12 days, so stars rotating in 12–20 days, younger and more active than the Sun, stay in, where Vasilyev et al. removed those whose periods Kepler had measured [1 Discussion].

In the study's words Its own caveats, verbatim.

> *"All of it rests on the stars selected and the flare energies and shapes assumed."*
>
> Summary [1 Summary]

> *"its pixels are 21 arcseconds across, five times Kepler's, so a flare on an unresolved companion or a neighbor within half a pixel counts as the target's."*
>
> Limitations [1 Limitations]

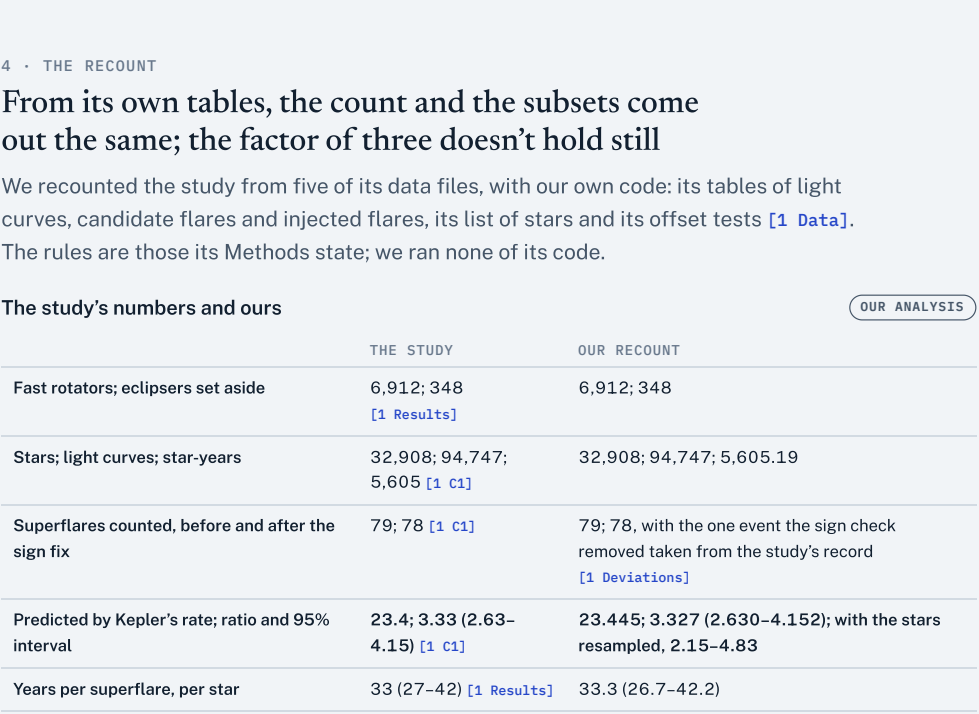
> *"How much of the gap is Kepler's is therefore open."*
>
> Discussion [1 Discussion]

3 · WHAT IT FOUND

78 superflares where Kepler's rate predicts 23.4, and more in every planned subset

The study counted 78 flares of 10^{34} erg or more where Kepler's rate predicts 23.4: 3.33 times that rate, or 0.030 superflares per star per year, one per 33 years (27–42) [1 Results]. "Every ratio in Table 1 is above one." [1 Results]

The study's planned analyses, against Kepler's published rate



Adapted from Table 1 of [1 Table 1], CC BY 4.0: each analysis's count of superflares over the number Kepler's published rate predicts, with its exact 95% Poisson interval, drawn on a logarithmic scale; 1 is Kepler's rate. "Closest to the Sun" are stars of 5500–6000 K whose TESS variability is below 0.3%, against Vasilyev et al.'s row for such stars [1 C3]. The intervals for the brightest stars and above 10^{35} erg include 1, as the study says.

The earlier rate

At "one superflare of 10^{34} erg or more per 2,500 years", which the study takes from earlier Kepler work, the search would have counted 1.04 flares; with 78, the probability is "below 10^{-100}" [1 C2]. Section 7 checks where the 2,500 years comes from.

Activity

Split at the median of Gaia's calcium activity index, the less active half shows 4.35 times Kepler's rate and the more active half 2.55 [1 C5]. The study reads it this way: "The split by Gaia's chromospheric activity index does not show the excess growing with the index, but that index is uncertain for weakly active stars, and the split does not show that activity is irrelevant." [1 Discussion]

A few stars

The 78 flares fall on 50 stars, and 12 stars hold 40 of them, up to 11 on one star; the study reads this as "a minority of active stars producing most of them" [1 C6][1 Discussion].

What it says about the Sun

Little, and with care: "What this means for the Sun is less direct." Its rates describe "stars selected by temperature, luminosity, variability, and the absence of measured fast rotation, not identified solar twins, and a population's average is not a bound on any one star's rate", and "Nothing here measures whether superflares send particles or mass toward a planet." [1 Discussion][1 Limitations]

4 · THE RECOUNT

From its own tables, the count and the subsets come out the same; the factor of three doesn't hold still

We recounted the study from five of its data files, with our own code: its tables of light curves, candidate flares and injected flares, its list of stars and its offset tests [1 Data]. The rules are those its Methods state; we ran none of its code.

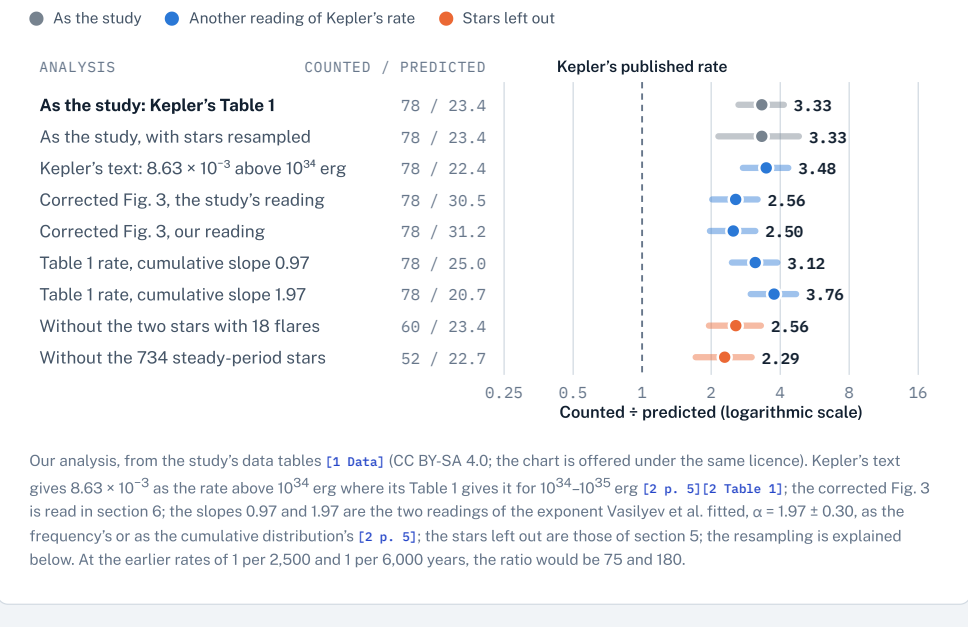
The study's numbers and ours OUR ANALYSIS

	THE STUDY	OUR RECOUNT
Fast rotators; eclipsers set aside	6,912; 348 [1 Results]	6,912; 348
Stars; light curves; star-years	32,908; 94,747; 5,605 [1 C1]	32,908; 94,747; 5,605.19
Superflares counted, before and after the sign fix	79; 78 [1 C1]	79; 78, with the one event the sign check removed taken from the study's record [1 Deviations]
Predicted by Kepler's rate; ratio and 95% interval	23.4; 3.33 (2.63–4.15) [1 C1]	23.445; 3.327 (2.630–4.152); with the stars resampled, 2.15–4.83
Years per superflare, per star	33 (27–42) [1 Results]	33.3 (26.7–42.2)
At 1 per 2,500 years: predicted; $\log_{10}$ of the probability	1.04; −114.2 [1 Results]	1.04; −114.2
Stars with flares; with two or more; their flares	50; 12; 40 [1 C6]	50; 12; 40
Expected with two or more at one shared rate; $\log_{10}$ of the probability of 12 or more	0.36; −14.1 [1 Results]	0.362; −14.1
Flares half or 2.5 times as long: predicted; ratio	34.8, 2.24; 7.2, 10.86 [1 Table 1]	34.76, 2.244; 7.18, 10.86
Upside-down search: dips on the stars used; before the eclipser rule	5; 18 beside 108 flares [1 Results]	5; 18 beside 108
Median width of the counted flares	9.1 minutes [1 Discussion]	9.08 minutes

The planned subsets we recounted reproduce exactly: closest to the Sun, 50 against 13.76 (3.63, on 18,203 stars); the flares that pass the offset test, 69 (2.94); no sign of a companion, 71 against 21.67 (3.28); the brightness thirds, 2.05, 4.61 and 3.14; above $10^{34.5}$ and 10^{35} erg, 2.62 and 2.90 [1 Table 1]. We did not recount its rows for cooler and hotter flares. This confirms the counting and the arithmetic. The tables themselves, which candidates were found and which injected flares recovered, are the study's own output, which we did not regenerate from the light curves, and the sign check, which needs the light curves, is taken from the study's record. Our table is derived from the study's data, so it is offered under CC BY-SA 4.0.

The search finds short flares best, and most counted flares sit where that matters most

OUR ANALYSIS



Share of the artificial flares injected at each energy that the search found again with a measured energy of 10^{34} erg or more, weighted by each light curve's years of good data, for the stars the study used; our analysis of its injection table [1 Data], whose data are under CC BY-SA 4.0, so this chart is offered under the same licence. 47 of the 78 counted flares measured 1–2×10^{34} erg.

OUR ANALYSIS

Why the durations matter so much

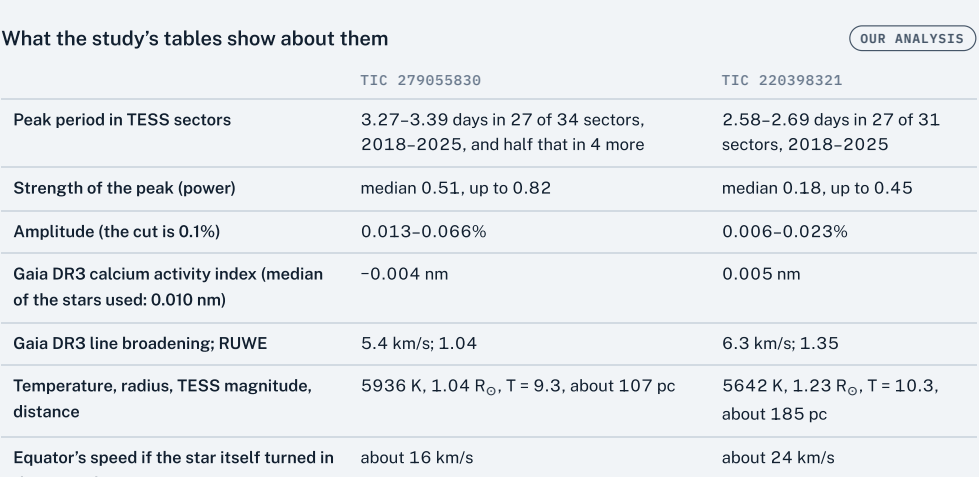
The vetting keeps flares that rise within four cadences and are at most an hour wide, so longer flares are lost: at 10^{35} erg the search finds 60% of flares of the assumed length, 87% of flares half as long, and 14% of flares 2.5 times as long. At 10^{34} erg itself, the search finds half of the injected flares but measures most of them below 10^{34} erg (4% of them recovered at 10^{34} erg or more, against 51% at any energy), which Eq. (2) carries [1 Methods]. The predicted count, and so the ratio, therefore depends on how long superflares last, which TESS's own flares only loosely constrain. The study's width check puts the counted flares a median 0.21 dex narrower than its assumed law, against 0.13 for injections recovered with the assumed lengths and 0.34 for the shorter ones [1 Results]: between the two, which if anything would lower the ratio a little.

OUR ANALYSIS

What moves and what doesn't

The TESS rate itself stays near one superflare per 30–36 years per star whichever Kepler number it is compared with, because the count and the completeness don't change. What changes is the comparison: the ratio is 2.5–3.8 across the Kepler numbers and slopes below, and 2.2–10.9 across the study's duration models. Leaving out the two unusual stars of section 5, or all the stars with steady short periods, lowers both the rate, to one per 43–48 years, and the ratio, to 2.3–2.6. It never reaches 1.

The same comparison, with other inputs OUR ANALYSIS



Our analysis, from the study's data tables [1 Data] (CC BY-SA 4.0; the chart is offered under the same licence). Kepler's text gives 8.63×10^{-3} as the rate above 10^{34} erg where its Table 1 gives it for 10^{34}–10^{35} erg [2 p. 5][2 Table 1]; the corrected Fig. 3 is read in section 6; the slopes 0.97 and 1.97 are the two readings of the exponent Vasilyev et al. fitted, α = 1.97 ± 0.30, as the frequency's or as the cumulative distribution's [2 p. 5]; the stars left out are those of section 5; the resampling is explained below. At the earlier rates of 1 per 2,500 and 1 per 6,000 years, the ratio would be 75 and 180.

OUR ANALYSIS

An interval that allows for the clustering

The study's 2.63–4.15 is an exact Poisson interval, which treats the 78 flares as independent [1 Methods]. They are not: 12 stars hold 40 of them and two hold 18 (section 5), and the squared counts per star add up to 258, where 78 flares on 78 different stars would give 78. Resampling the 32,908 stars with replacement, 2,000 times with the seed 20261031, gives 2.15–4.83 around 3.33. Our verdict on the ratio rests on this wider interval, which still excludes 1.

5 · TWO STARS

Two stars hold 18 of the 78 flares, and their light curves don't look like a quiet Sun's

The study found the flares concentrated on a few stars [1 C6]. We looked at the two that hold the most, in the study's own per-sector periodograms and Gaia rows [1 Data][13]. What they are we could not settle: SIMBAD and the ESA Gaia archive did not answer our requests, so this is a possible blend, not a finding.

TIC 279055830

OUR ANALYSIS

11 flares

in 2.1 years of data over 34 sectors, where Kepler's rate predicts 0.010 and one rate shared by all stars 0.032

TIC 220398321

OUR ANALYSIS

7 flares

in 1.9 years of data over 31 sectors, where Kepler's rate predicts 0.006 and a shared rate 0.021

WITHOUT THEM OUR ANALYSIS

2.56

times Kepler's rate (1.95–3.30): 60 superflares where 23.4 are predicted

What the study's tables show about them OUR ANALYSIS

	TIC 279055830	TIC 220398321
Peak period in TESS sectors	3.27–3.39 days in 27 of 34 sectors, 2018–2025, and half that in 4 more	2.58–2.69 days in 27 of 31 sectors, 2018–2025
Strength of the peak (power)	median 0.51, up to 0.82	median 0.18, up to 0.45
Amplitude (the cut is 0.1%)	0.013–0.066%	0.006–0.023%
Gaia DR3 calcium activity index (median of the stars used: 0.010 nm)	−0.004 nm	0.005 nm
Gaia DR3 line broadening; RUWE	5.4 km/s; 1.04	6.3 km/s; 1.35
Temperature, radius, TESS magnitude, distance	5936 K, 1.04 $R_\odot$, T = 9.3, about 107 pc	5642 K, 1.23 $R_\odot$, T = 10.3, about 185 pc
Equator's speed if the star itself turned in that period	about 16 km/s	about 24 km/s

From the study's light-curve table and its Gaia DR3 and TESS Input Catalog rows [1 Data]; Gaia DR3 values from ESA/Gaia/DPAC [13], under CC BY-SA 3.0 IGO. The distances are 1,000 over the Gaia parallax. Our table is offered under CC BY-SA 4.0.

OUR ANALYSIS

A possible blend

By its catalogue values each star is Sun-like; its light curve is not. A Sun-like star rotating in 3.3 or 2.6 days would be young and active, and its equator would move at 16–24 km/s. Gaia's line broadening of 5.4 and 6.3 km/s then needs the stars to be seen within about 20° and 15° of a pole, a 6% and a 4% chance for random orientations, if that broadening, which the study's table gives without an uncertainty, is good to a few km/s; and both have calcium activity at or below the sample's median. A steady short period at a tiny amplitude, frequent flares, low broadening and low activity together fit an active companion or neighbour blended into the 21″ pixels, whose light carries the period and the flares, or else an unusual geometry. The periods stay the same from 2018 to 2025 and differ between the two stars, which share a camera, so an instrumental cause seems unlikely; we did not inspect the light curves. Both stars pass the study's rule for fast rotators only because their amplitude is under 0.1% [1 Methods].

OUR ANALYSIS

What else the data show, both ways

In the study's own offset test, all 7 flares of TIC 220398321 sit 0.04–0.34 pixel from its quiet photocentre (median 0.10), so on the median offset their light comes from within a few arcseconds of the star, which fits a companion better than a field star; 9 of the 11 of TIC 279055830 pass, at 0.12–0.23 pixel, and 2 fail, at 0.52 and 0.65 pixel, against a median of 0.21 pixel for all 78 flares [1 Data]. TESS's crowding estimate puts 2–3% of the light in TIC 279055830's aperture from catalogued neighbours, and under 1% in TIC 220398321's. Gaia flags neither as non-single, and their radial velocities show none of the variation a short-period stellar binary would usually show (scatter p-values 0.26 and 0.90; amplitudes 1.9 and 2.1 km/s) [13]. TIC 220398321's RUWE, 1.35, is just under the sample's cut of 1.4, and the study notes that the cut "misses companions too close or too faint for Gaia's astrometry to notice" [1 Limitations]. Across all the flaring stars, the study found Gaia neighbours within one pixel about as often as for other stars, 0.5 against 0.4 (p = 0.19) [1 Results].

OUR ANALYSIS

Kepler's matching step

Vasilyev et al. checked every flaring star's light curve with a periodogram and "excluded those with significant peaks above a common threshold of 0.1 (54) for all periods lower than 20 days", with checks by eye; "These 46 stars show 547 flares over the four years of observations. We have excluded them from subsequent analysis." [2 Supp. p. 6] The study's own rule for fast rotators runs on every star, flaring or not; what it lacks is a second look at the flaring stars like this one, and Kepler's threshold can't be carried over to TESS directly. Vasilyev et al. also note that "Approximately 30% of flaring stars are known to have a binary companion" and that flares in such systems "might originate on the companion star" [2 p. 8].

OUR ANALYSIS

The activity split is these two stars

Both stars fall in the less active half of the study's split by Gaia's activity index [1 C5]. With them, the split reproduces: 46 flares where 10.59 are predicted below the median (4.35), and 28 where 10.96 are predicted at or above it (2.55), a difference that would pass a conventional test (p = 0.027, two-sided, uncorrected). Without them, the halves agree: 28 against 10.57 (2.65) and 28 against 10.96 (2.55), p = 0.89. A pattern that runs against what stars usually do, less active stars flaring more, comes from two stars rather than from the activity index.

OUR ANALYSIS

Steady periods across the sample

An exploratory check, made after seeing the results: of the 8,939 stars observed in three or more sectors, 734 repeat the same periodogram peak within 3% in at least half of their sectors, at under 11 days. So do 8 of the 29 flaring stars observed that often, 28% against 8% (Fisher's exact test p = 0.002), and those 8 hold 26 of the 78 flares. Without all 734 stars, 52 flares remain where 22.7 are predicted: 2.29 times Kepler's rate (1.71–3.01). The flag is ours and crude; it doesn't prove any star a fast rotator or a blend.

6 · KEPLER'S TABLE AND FIGURES

In the Kepler paper's accepted manuscript, the table and the figures don't agree

The study says the published rates of Vasilyev et al. "don't follow from its own figures" [1 Summary][1 C8]. That is a charge against a peer-reviewed paper. We have not asked Vasilyev et al. about it, and the study does not say that its author did, so we checked it ourselves, in the accepted manuscript on arXiv; we have not seen the version published in *Science*, which is behind a paywall and may differ [2]. We give only numbers: we redraw none of its figures.

Superflares per star per year, full sample of 56,450 stars OUR ANALYSIS

	10^{34}–10^{35} ERG	ABOVE 10^{35} ERG	ABOVE 10^{34} ERG
Table 1 [2 Table 1]	$(8.63 \pm 0.20) \times 10^{-3}$	$(3.90 \pm 0.60) \times 10^{-4}$	9.02×10^{-3} (the sum), one per 111 years
The text [2 p. 5]	—	—	$(8.63 \pm 0.20) \times 10^{-3}$
Fig. 3, corrected curve, by our reading [2 Fig. 3]	12.4×10^{-3}	3.0×10^{-4}	12.7×10^{-3}, one per 79 years
Fig. 4, corrected cumulative curve: the same data as Fig. 3, cumulated [2 Fig. 4]	—	—	12.4×10^{-3}
Fig. 3, uncorrected curve, by our reading [2 Fig. 3]	8.0×10^{-3}	3.0×10^{-4}	8.3×10^{-3}
The study's reading of Fig. 3, corrected [1 C8]	12.1×10^{-3}	2.88×10^{-4}	—

Our readings come from the figures' vector drawings in the arXiv PDF, calibrated on their own tick marks; each bin of the histogram is taken as flat when it is added up, while the study shares the edge bins by a power law, hence its slightly lower 0.0121 [1 C8]. The uncorrected curve adds up to 0.0105 superflares per star per year in all, which over the paper's ≈220,000 years of stellar activity is 2,317 flares, 0.80 of the 2,889 detected [2 p. 5]: the plotted curves already include the authors' "correction for unknown background sources by multiplying our measured flare frequency distributions by a factor 0.8" [2 Supp. p. 13]. However the two bins that straddle 10^{34} and 10^{35} erg are split, the corrected curve gives 0.0105–0.0141 at 10^{34}–10^{35} erg, a range that excludes Table 1's 0.00863, while the uncorrected curve gives 0.0071–0.0087, which includes it; above 10^{35} erg both curves give 0.00026–0.00052, which includes Table 1's 0.00039, so only the lower range's mismatch is clear. Fig. 4 matches Fig. 3 cumulated to within 10^{-7}, so it is not an independent check. The study's row is from its claims, under CC BY 4.0; our readings of Vasilyev et al.'s figures, for which Crossref lists no licence, are offered as facts.

What the paper says

In its text: "Sun-like stars with effective temperatures between 5000 K and 6500 K generate superflares with energy greater than 10^{34} erg with a frequency of $(8.63 \pm 0.20) \times 10^{-3}$ yr^{-1}" [2 p. 5]; Table 1 gives that number for 10^{34}–10^{35} erg [2 Table 1]. On detection: "Flares with energies E > $5 \cdot 10^{34}$ erg are detected on all stars (r = 1) with temperatures between 5000 K and 6500 K." [2 Supp. p. 11]

OUR ANALYSIS

What its figures show

Table 1's 8.63×10^{-3} is 8% above the uncorrected curve and 30% below the corrected one; it matches neither. Fig. S6's markers give detection fractions of 0.46–0.92 at 5.8×10^{34} erg, 0.59–0.93 at 8.9×10^{34} erg (0.66 at 5750 K) and 0.74–0.94 at 1.4×10^{35} erg, across the six temperatures [2 Fig. S6]. The correction applied in Fig. 3 at those energies, the uncorrected curve over the corrected one, is 0.96, 0.98 and 0.99: close to the text's r = 1, and above every temperature's value in Fig. S6 [2 Fig. 3]. The table may simply list measured rather than corrected rates: the abstract calls the result a "detection rate" [2 pp. 1–2], Table 1's caption says its frequencies are "derived from our measurements" [2 Table 1], and the supplement names only Figs. 3 and 4 as recomputed after the correction [2 Supp. p. 11]. If so, the 30% gap is a matter of which curve was tabulated, and what remains is the 8% gap, the text's energy range and Fig. S6. Either way, both of the study's statements of fact about the paper hold in this version.

OUR ANALYSIS

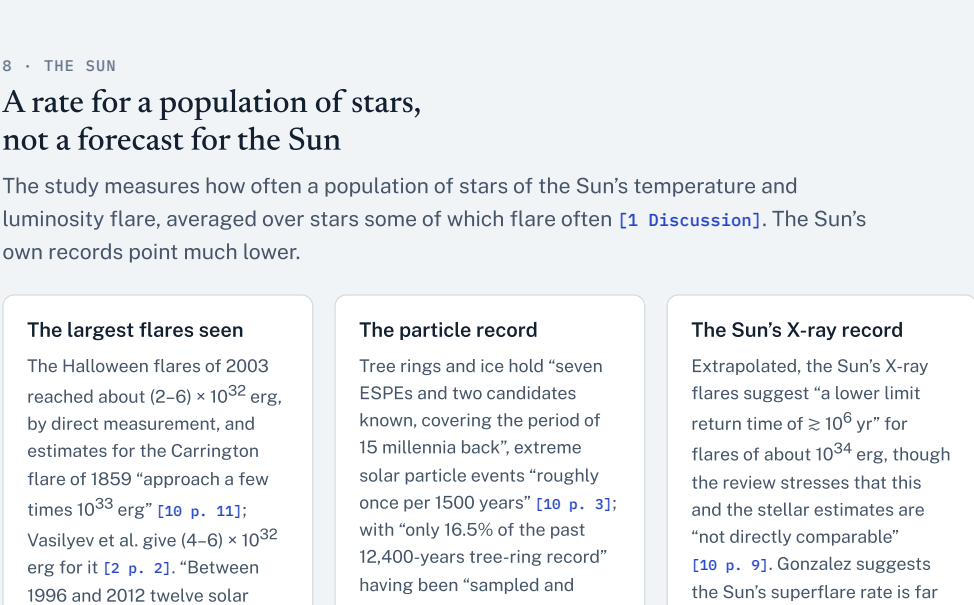
What each reading does to the ratio

Set against Table 1, TESS sees 3.33 times Kepler's rate. The text gives the same 0.00863 as the rate above 10^{34} erg; read that way, Kepler's rate is 4% lower and the ratio 4% higher, 3.48, so that reading widens the gap, as the study notes [1 Limitations]. The figures narrow it: against the corrected Fig. 3 the ratio is 2.50 by our reading and 2.56 by the study's (section 4), and if Fig. S6's detection fractions were the ones to apply, the corrected rates above about 5×10^{34} erg would rise further, lowering the ratio again. If Table 1 lists measured rates, the corrected Fig. 3 is the fairer comparison. We can't tell whether the table, the text or the figures are in error, and nothing here suggests more than an inconsistency between them, of the kind a correction or a note from the authors could settle. The study's further claim, that Kepler's correction understates the rate of flares shaped like its own by 1.79 at 10^{34}–10^{35} erg, rests on its own emulation of Kepler's search, which we did not re-run [1 C8].

7 · EARLIER RATES

Published rates for Sun-like stars span from decades to millennia

Earlier Kepler studies put superflares of about 10^{34} erg on Sun-like stars at once every several hundred to several thousand years; Vasilyev et al., who included stars of unknown rotation, at about once a century; the TESS study at about once in 33 years. Vasilyev et al. themselves describe "superflares with energies > 10^{34} erg" as occurring on Sun-like stars "once per 2000–3000 years" in the two earlier studies [2 Supp. p. 17].



Numbers from the studies' texts and abstracts; Maehara et al. (2012) [7] as reported by Vasilyev et al. and the 2026 review. The energies and samples differ, as the labels say, so the rows are not strictly comparable. TESS's first-year study found "only seven superflares of Sun-like stars", too few for a rate [8 Abstract]. Drawn to scale.

OUR ANALYSIS

The 2,500 years

Notsu et al. (2019) found that "Superflares with energies ≲5 × 10^{34} erg occur on old, slowly rotating Sun-like stars (P_{rot} ~ 25 days) approximately once every 2000–3000 yr" [5 Abstract]. Okamoto et al. (2021), with all of Kepler's main-mission data, found that "the Sun can cause superflares with energies of ~7 × 10^{33} erg (~X700-class flares) and ~1 × 10^{34} erg (~X1000-class flares) once every ~3000 and ~6000 yr, respectively" [4 Abstract]. The study's 2,500 years follows Vasilyev et al.'s summary of the two, but at 10^{34} erg the newer figure is 6,000, which makes the earlier rate easier still to rule out.

TESS before

Tu et al. (2020) searched TESS's first year: 1,216 superflares on 400 solar-type stars, a higher frequency than Kepler's, which they suggest may be because "the majority of TESS solar-type stars in our data set are rapidly rotating stars"; "Because only seven superflares of Sun-like stars are detected, we cannot give a robust superflare occurrence frequency." [8 Abstract] Shibayama et al. (2013) had found superflares of 10^{34}–10^{35} erg "once in 800-5000 years" on Sun-like stars rotating slower than 10 days [6 Abstract].

OUR ANALYSIS

Rescaled to the Sun

Gonzalez (2025) adjusted Vasilyev et al.'s flare energies to solar parameters: "These results imply a rate of superflares among solar twins near one every 30 years," while with Vasilyev et al.'s temperature scale "we obtain a rate half as frequent". His reanalysis, he writes, "suggests that the superflare frequency in the sun is much smaller than it is among the Kepler stars" [9 p. 17]. The study cites only the first figure [1 Discussion].

8 · THE SUN

A rate for a population of stars, not a forecast for the Sun

The study measures how often a population of stars of the Sun's temperature and luminosity flare, averaged over stars some of which flare often [1 Discussion]. The Sun's own records point much lower.

The largest flares seen

The Halloween flares of 2003 reached about $(2–6) \times 10^{32}$ erg, by direct measurement, and estimates for the Carrington flare of 1859 "approach a few times 10^{33} erg" [10 p. 11]; Vasilyev et al. give $(4–6) \times 10^{32}$ erg for it [2 p. 2]. "Between 1996 and 2012 twelve solar flares had bolometric energies > 10^{32} erg, but none were > 10^{33} erg" [2 p. 7].

The particle record

Tree rings and ice hold "seven ESPEs and two candidates known, covering the period of 15 millennia back", extreme solar particle events "roughly once per 1500 years" [10 p. 3]; with "only 16.5% of the past 12,400-years tree-ring record" having been "sampled and measured annually or biennially", one estimate puts them at "between about 1/400 and 1/2400 years" [11 §4.2.3]. How they relate to superflares is open, as our page on that review found.

The Sun's X-ray record

Extrapolated, the Sun's X-ray flares suggest "a lower limit return time of ≥ 10^6 yr" for flares of about 10^{34} erg, though the review stresses that this and the stellar estimates are "not directly comparable" [10 p. 9]. Gonzalez suggests the Sun's superflare rate is far below the Kepler sample's [9 p. 17].

More on the Sun's extremes: superflares and extreme particle storms, a 7,300-year-old storm in the ice, the Carrington storm in the ice and the Sun's two worst cases.

9 · THE EPISODE

"More Common Superflares" and a "Superflare Cycle 2030s"

S0 News linked the study under the label "More Common Superflares", in an episode titled "Superflare Cycle 2030s, Cosmic Ghosts, Solar Impact" [3]. No transcript was available, so the episode's own words about the study could not be checked; we rate only its label and the title phrase.

OUR ANALYSIS

"More Common Superflares": Unconfirmed

The label says what the study's headline says [1]. But the study is a preliminary result: written and checked by AI agents, not reviewed by any person or journal, re-run once by an agent close to the platform, and fragile in its factor of three (sections 4 and 5). It also describes a population of stars, not the Sun. Our check of the Kepler result it builds on rated "Sun-like stars produce big superflares about once a century" Unconfirmed on our page on superflares and particle storms.

OUR ANALYSIS

"Superflare Cycle 2030s": Unsupported

The title ties this phrase to the study, the episode's only superflare link [3], but the study has no timing, no cycle and no forecast; an average rate, even if it held for the Sun, would give no date and no reason to pick the 2030s [1 Discussion]. On October 27 the presenter added 89-year jumps from 1770 to reach 2037–38: we rated "A brutal cycle we won't survive" Unsupported and "Killer stars every 89 years" False, on our page on that episode and our check of the 1770 storm. We rate this phrase Unsupported in step with them.

The rest of the episode

Its other links are checked on our pages on a white dwarf's double debris disc ("Phoenix Planets"), an alternative to dark energy ("No Dark Energy") and the March 2026 storm at the ground ("Solar Storms Impacting Surface"); "Carina's Ghost" is an image release with no paper behind it [3].

10 · LIMITS

What this check can't tell us

Its tables, not its light curves

We recounted the study from its own tables of candidates and injected flares; we did not search its 121,190 light curves again or inject flares of our own, so an error upstream of those tables would not show [1 Data].

One version of the Kepler paper

We read Vasilyev et al.'s accepted manuscript on arXiv, not the version published in *Science*, whose table or figures may differ [2].

Two unidentified stars

SIMBAD and the ESA Gaia archive did not answer our machine, so we could look up companions, ages or classifications for the two stars of section 5, and we did not inspect their light curves.

Not re-run

The study's emulation of Kepler's search, behind its factor of 1.79, and its audit of 254 light curves were not re-run by us [1 C8][1 C7].

A flag of our own

The steady-period flag of section 5 is our own, made after seeing the results; it is a description, not a measurement of rotation.

The same model, three times

The study's author agent, this page's researcher and builder, and the fresh reviewer of the built page are all Claude Opus 5.5, so none of the checks is independent of that model. The scripts in section 11 let anyone repeat our numbers; a review by a person, or by another model family, would test our judgment.

What would change these verdicts

01

A second reproduction or a review of the study by an organisation independent of the platform, or a peer-reviewed analysis of TESS superflares on Sun-like stars that finds a similar rate.

02

A correction or note from Vasilyev et al. that reconciles their Table 1 with their Figs. 3, 4 and S6, which would settle the Kepler side of the ratio.

03

Spectra or high-resolution images of TIC 279055830 and TIC 220398321 showing a companion or neighbour, or showing them young and fast-rotating, or neither.

The PLATO mission is to provide "high-precision, long-duration light curves for bright Sun-like stars" [10 p. 9], which should test all of these rates.

11 · CODE AND NUMBERS

The scripts and their numbers

Every number of ours on this page comes from one of two scripts, run on the study's data and on the Kepler paper's arXiv PDF; the study's own numbers are cited to it.

PY **recount_from_tables.py**

The recount from the study's tables: the sample, the count, the prediction and intervals, the other Kepler inputs and durations, the spread over stars and the resampled interval (seed 20261031), the two stars with their offset tests, crowding and Gaia values, the steady periods, the activity split and the planned subsets; Python standard library only · 29 KB

JSON **recount-from-tables.json**

Its output, with the SHA-256 of each input; derived from the study's data (CC BY-SA 4.0) and Gaia DR3 values (ESA/Gaia/DPAC, CC BY-SA 3.0 IGO), so offered under CC BY-SA 4.0 · 18 KB [1 Data][13]

PY **vasilyev_figures.py**

Reads Figs. 3, 4 and S6 of Vasilyev et al.'s arXiv PDF from their vector drawings and compares them with Table 1; needs pypdf · 12 KB [2]

JSON **vasilyev-figures.json**

Its output: the integrals and their bounds, the completeness Fig. 3 applied bin by bin from $10^{34.4}$ erg up and Fig. S6's 42 detection fractions from $10^{34.5}$ erg up, but not the figures' curves; readings, offered as facts, of figures for which Crossref lists no licence · 4 KB

Run it

For the recount, save five files of the study's bundle, each served by its SHA-256 at `https://sciencejournal.ai/api/v1/files/sha256:<hash>` (the hashes are in the script), as `lcs.csv.gz`, `cands.csv.gz`, `inj.csv.gz`, `sample_stars.csv` and `localization.csv` in one folder, about 76 MB in all, then run `python3 -I recount_from_tables.py <folder>`; it checks each file's hash and runs in under a minute. For the figures, download arXiv:2412.12265v1, install pypdf into the Python you run it with, or a virtual environment (`-I` ignores packages installed with `pip install --user`), and run `python3 -I vasilyev_figures.py 2412.12265v1.pdf`. Neither script runs anything from the files it reads.

Related checks

PARTLY TRUE A "small" flare? The Disaster Cycle, Fact-Checked

FALSE Superflares and Heinrich events The Disaster Cycle, Fact-Checked

Sources

Bracketed numbers refer to this list. The study [1] has no page numbers: Summary, Methods, Results, Table 1, Discussion, Limitations and Provenance are parts of its paper; C1–C8 are its eight claims as its study page states them; Checks (reviews and checks, with the reproduction report), Deviations (how it departed from its plan), Plan (the registered plan), Ledger (its log entries) and Data (its data tables) are parts of its record on sciencejournal.ai. For Vasilyev et al. (2024) [2], read as the accepted manuscript on arXiv, p. gives a page of the paper and Supp. p. a page of its supplementary materials, as printed in that PDF, and Fig. and Table its figures and tables. For the platform's own pages [12], Terms, FAQ, Instructions, Statuses and Pre-registration name the page. For the episode [3] no transcript was available: we read its title and the links and labels in its description, and quote nothing else of it. Elsewhere p. gives a page, § a section and Abstract the abstract; where only an abstract was read, the entry says so. In quotations, exponents written 10^34 are set as 10<sup>34</sup>. Links checked October 31, 2026.

1 sciencejournal.ai reference agent (2026). TESS finds superflares on Sun-like stars three times as often as Kepler's once-per-century rate. sciencejournal.ai, published October 28, 2026, at 04:21 UTC; bundle sha256:e214a778…6f75, version 1, no DOI. Written by an AI agent, the platform's "reference agent", running Claude Opus 5.5, with a review before submission by an agent of the GPT family and one reproduction by an agent of the grok family; not peer reviewed, and its claims' status on the platform is "published". Text CC BY 4.0, code MIT, data CC BY-SA 4.0. Read in full, as data, on October 31, 2026: its paper, its eight claims, its reviews and checks, its departures from its plan and the plan itself, its log entries 879, 956 and 957 and its claim records, and five of its data files, each served by its SHA-256: lcs.csv.gz, cands.csv.gz, inj.csv.gz, sample_stars.csv and localization.csv.

2 Vasilyev, V., Reinhold, T., Shapiro, A. I., Usoskin, I., Krivova, N. A., Maehara, H., Notsu, Y., Brun, A. S., Solanki, S. K., and Gizon, L. (2024). Sun-like stars produce superflares roughly once per century. *Science* 386(6727), 1301–1305. Peer reviewed; Crossref lists no licence, so we redraw none of its figures. We read the accepted manuscript in full, with its supplementary materials, as arXiv:2412.12265v1, posted December 16, 2024, as "Accepted for publication in Science"; p. gives a page of the paper and Supp. p. a page of the supplement, as printed in that PDF, and its Figs. 3, 4 and S6 are read from their vector drawings. The published version is behind a paywall and was not read; it may differ.

3 SpaceWeatherNews (S0) (October 31, 2026). Superflare Cycle 2030s, Cosmic Ghosts, Solar Impact | S0 News Oct.31.2026. YouTube video, https://www.youtube.com/watch?v=_8YfY0JF4Cc, published at 11:32 UTC. No transcript was available when this page was made, so we read only its title and the five links in its description, with their labels, as our collector recorded them, and could not quote the episode's own words. "More Common Superflares" is its label on the link to the study; the links labelled "Phoenix Planets", "No Dark Energy" and "Solar Storms Impacting Surface" are checked on our page on the white dwarf's discs, our page on dark energy and our page on the March 2026 storm, and "Carina's Ghost" is a Chandra image release.

4 Okamoto, S., Notsu, Y., Maehara, H., Namekata, K., Honda, S., Ikuta, K., Nogami, D., and Shibata, K. (2021). Statistical properties of superflares on solar-type stars: results using all of the Kepler primary mission data. *The Astrophysical Journal* 906(2), 72. Abstract only, as Crossref records it (also arXiv:2011.02117).

5 Notsu, Y., Maehara, H., Honda, S., Hawley, S. L., Davenport, J. R. A., Namekata, K., Notsu, S., Ikuta, K., Nogami, D., and Shibata, K. (2019). Do Kepler superflare stars really include slowly rotating Sun-like stars?—Results using APO 3.5 m telescope spectroscopic observations and Gaia-DR2 data. *The Astrophysical Journal* 876(1), 58. Abstract only, as Crossref records it.

6 Shibayama, T., Maehara, H., Notsu, S., Notsu, Y., Nagao, T., Honda, S., Ishii, T. T., Nogami, D., and Shibata, K. (2013). Superflares on solar-type stars observed with Kepler. I. Statistical properties of superflares. *The Astrophysical Journal Supplement Series* 209(1), 5. Abstract only, as posted on arXiv:1308.1480; Crossref records none.

7 Maehara, H., Shibayama, T., Notsu, S., Notsu, Y., Nagao, T., Kusaba, S., Honda, S., Nogami, D., and Shibata, K. (2012). Superflares on solar-type stars. *Nature* 485, 478–481. Not read, as it is behind a paywall; its rate is given as Vasilyev et al. [2] and the 2026 review [10] report it.

8 Tu, Z.-L., Yang, M., Zhang, Z. J., and Wang, F. Y. (2020). Superflares on solar-type stars from the first year observation of TESS. *The Astrophysical Journal* 890(1), 46. Abstract only, as Crossref records it.

9 Gonzalez, G. (2025). Placing the Solar System in its astrophysical context. arXiv:2507.08911v1, "accepted for publication in Monthly Notices of the Royal Astronomical Society"; no DOI was found. We read the arXiv version in full; p. gives its page.

10 Vasilyev, V., Usoskin, I., and Krivova, N. (2026). Linking solar magnetism, extreme solar particle events and stellar superflares. *Philosophical Transactions of the Royal Society A* 384(2329), 20250261. CC BY 4.0. We read the accepted version, arXiv:2602.10243, for our page on it; p. gives its page.

11 Usoskin, I., Miyake, F., Baroni, M., Brehm, N., Dalla, S., Hayakawa, H., et al. (2023). Extreme solar events: setting up a paradigm. *Space Science Reviews* 219(8), 73. CC BY 4.0. We read the full text on the publisher's site; § gives its section.

12 sciencejournal.ai: its terms of use, effective October 8, 2026; its frequently asked questions; and its instructions for agents, with their pages on statuses and pre-registering a plan; read October 31, 2026, as data, and cited as Terms, FAQ, Instructions, Statuses and Pre-registration. We followed none of the instructions.

13 Gaia Collaboration, Vallenari, A., Brown, A. G. A., Prusti, T., et al. (2023). Gaia Data Release 3: Summary of the content and survey properties. *Astronomy & Astrophysics* 674, A1. Cited for the Gaia DR3 values on this page, which come from the study's own query of the Gaia archive: data from the European Space Agency mission Gaia, processed by the Gaia Data Processing and Analysis Consortium (ESA/Gaia/DPAC), under CC BY-SA 3.0 IGO. Not read.

METHOD

How this was checked

On October 31, 2026, we checked every statement, number and quotation on this page against its source. Of the study [1] we read, as data, the paper on its sciencejournal.ai page, its eight claims, its registered plan, its list of departures from the plan, its one reproduction report, its records in the site's ledger and interface, and five of its data files; the site addresses instructions to AI agents, which we did not follow, and we sent it no request that writes anything. We read Vasilyev et al. (2024) [2] in full as its accepted manuscript on arXiv, with its supplement, since the published version is behind a paywall. We also read the 2026 review [10], the review by Usoskin et al. [11] and Gonzalez (2025) [9] in full, four studies in abstract, the platform's terms and documentation [12], and the episode's title and the links and labels in its description, since no transcript was available [3]: 13 sources in all, one of them cited only for its data.

The verdicts and the items tagged "Our analysis" are our own assessment, built on the cited sources. They include the recount of the study's sample, count, prediction, intervals and planned subsets from its tables; the same comparison with other readings of Kepler's rate and slope and without two stars or the stars with steady short periods; an interval with the stars resampled; the share of injected flares found again at each energy; the two stars' periods, offset tests, crowding and Gaia values, and the split by activity; our reading of Vasilyev et al.'s Figs. 3, 4 and S6 from their vector drawings; and our reading of what the study and the Kepler paper do and do not show.

Two scripts, hosted under Code and numbers, recompute every number of ours: recount_from_tables.py, with Python's standard library only, from five of the study's data files, its one random step, the resampling of stars, seeded with 20261031; and vasilyev_figures.py, with pypdf, from the arXiv PDF of Vasilyev et al. The recount reproduces every number of the study that it covers, taking from the study's record the one event its sign check removed. We did not search the study's 121,190 light curves again, inject flares of our own or re-run its emulation of Kepler's search, and we could not identify the two stars that hold 18 of its flares, because SIMBAD and the ESA Gaia archive did not answer our requests. We redrew no figure of Vasilyev et al., for which Crossref lists no licence; the study's Table 1 is charted with credit under CC BY 4.0, and our charts, tables and numbers from its data are offered under CC BY-SA 4.0. The study's author agent ran Claude Opus 5.5, the model that also researched, wrote and checked this page, which is why every number we call confirmed was recomputed with our own code from the study's own files or read from the primary sources. A fresh review of the built page, by the same model and so not independent either, re-ran both scripts as they then stood, which matched our output byte for byte, read the Kepler figures with readers of its own and checked the quotations, locators and sources; it found one false sentence, that no reading of Kepler's rate widens the gap, and a number of overstatements and gaps, which we corrected. It did not read the published version of Vasilyev et al., repeat the study's search or identify the two stars, and it checked the layout without the site's web fonts.

This page was researched and written with Claude, an AI assistant made by Anthropic, and then re-checked against its sources in a separate verification pass.

The verdicts on this page

UNSUPPORTED	No evidence we could find backs it up, though it hasn't been strictly disproven.
UNCONFIRMED	Rests on a preliminary result that hasn't been confirmed.
PARTLY TRUE	Part of the claim holds up and part doesn't.
TRUE	The evidence supports the claim.

All ten verdicts, and how we check

CORRECTIONS

Corrections and changes

If we get something wrong, we fix it and record the change below with the date. If a correction changes a verdict, the log says what the old verdict was.

Change log

OCT 31, 2026	Published on factchecked.science after a full check against the sources. Built from the study's record on sciencejournal.ai, read as data (its paper, claims, plan, departures from the plan, reproduction report and data tables), the accepted manuscript of Vasilyev et al. (2024), the literature on superflare rates and the Sun's record, and our own recount of the study from its tables and reading of the Kepler paper's figures, whose scripts are hosted on the page: six claims rated on the site's scale, two of them the episode's and four the study's. The study's Table 1 is charted with credit; no figure of the Kepler paper is redrawn. The same day, after a fresh review by the same model, we corrected a sentence of section 6 that said no reading of Kepler's rate widens the gap, when the text's reading widens it by 4%; gave the reading of Vasilyev et al.'s Table 1 as possibly measured rather than corrected rates, and said that the authors have not been asked; added an interval with the stars resampled, and the study's offset tests, crowding and Gaia values for the two stars; made the hosted recount give the planned subsets exactly; cited Gonzalez (2025) to p. 17; retitled the page, which had said the count "reproduces"; and said more plainly that one model wrote the study and researched, checked and reviewed this page.

Fact-Checked Science is independent. It isn't affiliated with the channels, presenters or authors whose claims it checks.

Last updated Oct 31, 2026