The Rise of the Lone Scientist Under Agentic AI

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I have for some years held scientific papers with sole authorship at a disadvantage in terms of credibility. It's not an uninformed prejudice; too often a click on a sole-authored paper with an interesting premise leads into a self-indulgent and clearly under-challenged series of suppositions.

At their worst, solo-author papers suggest shades of *Frankenstein* – obsessive central figures fixated on an idea, but unable to find collaborators due to the irrationality or marginality of that idea; and then going it alone and publishing anyway, in case their fringe viewpoint should find an answering voice among the readership.

(I should note, however, that there are several categories besides Computer Science where sole authorship is common, if not the norm, such as the various strands in the Humanities, where some of the most significant works in their field are the products of single minds)

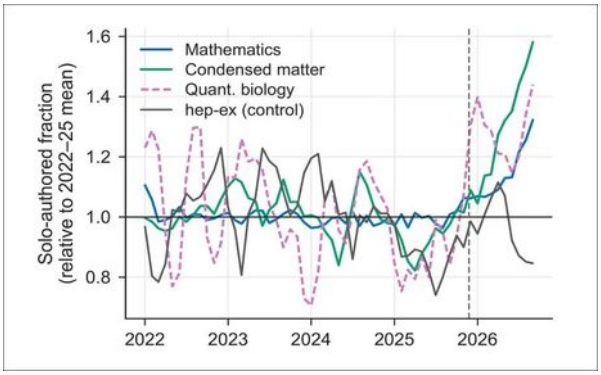
All For One

Lately, however, I have noticed not only that there are a greater number of sole-author papers turning up in the Arxiv preprint server, even to the point where I can no longer indulge my aversion; but, surprisingly, that the quality of these papers seems to be notably better than in prior years.

This intermittent observation has today been directly addressed in a new study – itself from a sole author heavily using Claude Opus 5.5 – that analyzes submission statistics at arxiv.org, and finds that the proportion of scientific papers *written by lone authors* has risen steeply since late 2025 – particularly in mathematics, condensed matter physics and quantitative biology.

In the first nine months of 2026, the new paper* asserts, single-author papers increased by 70% in mathematics; 71% in condensed matter physics; and 44% in quantitative biology. And, in mathematics, the share of papers written by one person had risen from a longstanding average of 28.8% to 37.7% by September of 2026:

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Changes in the proportion of single-author scientific papers from 2022 to 2026. Each field's 2022–2025 average is the baseline (1.0), so 1.5 indicates a 50% increase in the share of solo-authored papers. Three-month averages show sharp rises in mathematics, condensed matter physics and quantitative biology following late-2025 agentic AI releases (dashed line), but not in experimental particle physics. Computer science papers are excluded. Source

Of note is that the shift is absent from experimental particle physics, where large research teams are still essential. The author of the paper – who himself confesses at the paper's conclusion that his entire contribution to it *'consisted of some 60 interactions with [Claude]'* – suggests that agentic AI may be empowering individual scientists to undertake research that would previously have required collaborators.

The study also found that the explosion in scientific papers is not chiefly the work of a few hyperproductive individuals flooding arXiv with submissions, as Arxiv itself contends; but rather that *far more scientists are publishing* – and, increasingly, doing so alone†:

> *'The arXiv announcement accompanying the per-submitter limit attributes the surge in part to a small number of authors submitting very large numbers of papers. For mathematics, the field with the largest increase, the metadata do not support this as the principal mechanism.'*

It All Adds Up

The lone-author growth effect is most evident in mathematics, where submissions doubled within a year, with the increase most pronounced in branches of mathematics that rely on abstract reasoning rather than computing. In regard to this, the paper suggests that AI may be taking on intellectual work previously considered difficult to automate.

The author, working from the Department of Physics at Imperial College London, also considers the extent to which this 'tacit' or perceived automation may encroach on the *patentability* of novel research, or the ability of researchers to decide how restrictive a license it is released with†:

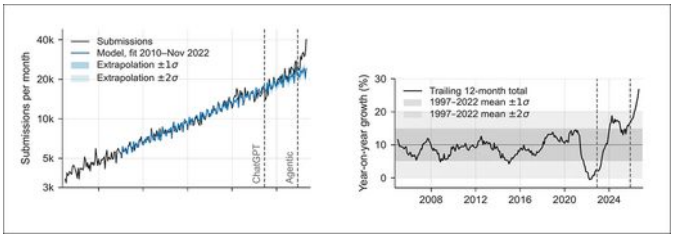
> *'Attribution also has a legal dimension. Under US law, material generated by an AI system without sufficient human creative control is not eligible for copyright [19, 20]. As the human contribution to a paper shifts from execution towards direction, the boundary between authored and generated work, and with it the basis of individual intellectual credit, will become harder to draw.*
>
> *'The outcome may be a renegotiated model of individual authorship, or a move towards collective credit for results produced with shared tools; either would change what an academic career consists of.*
>
> *'These questions concern the purpose of academic research as much as its mechanics. The pace of the change in the submission record suggests that they will need answers within years rather than decades.'*

Secret Revolution

Naturally, perhaps not least because of the unknown, aforementioned legal implications, the Arxiv submission metadata studied for the new work does not disclose *ad hoc* a rise in the use of agentic AI during the production.

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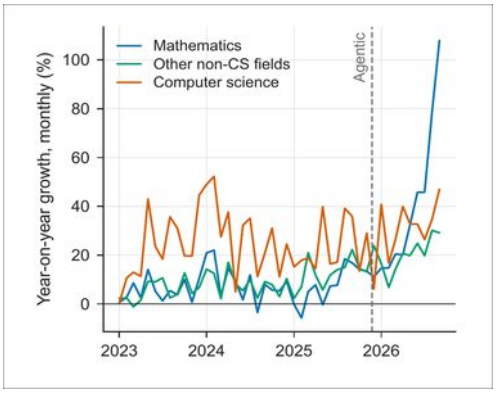
Instead, the author infers this from a steep rise in arXiv's historical growth rate, which averaged around 9% annually for three decades before accelerating markedly in early 2026 – shortly after the release of AI models capable of conducting extended research tasks with little supervision:



Growth in scientific paper submissions to arXiv. Left: monthly submissions (black) compared with predictions based on historical growth (blue), showing a sharp increase beyond expectations in 2026. Right: annual growth rates, showing a marked acceleration. Shaded areas indicate normal historical variation; vertical dashed lines mark the arrival of ChatGPT in 2022, and agentic AI models in late 2025. The new paper's data was entirely based on submission statistics made available via the Arxiv domain.

Between 2022 and 2025, arXiv's accelerating growth was largely driven by the boom in AI research, the paper asserts; but since December 2025, submissions *outside* computer science have been running 17% above their expected levels, with no comparable acceleration in AI research itself.

This defies the currently-popular idea that the Computer Science category is ballooning alone, while adjacent categories remain unaffected:



Monthly year-on-year growth in arXiv submissions from 2023 to September 2026, comparing mathematics (blue), other non-computer-science fields (green), and computer science (orange). Mathematics submissions accelerated sharply during 2026, overtaking computer science. The vertical dashed line marks the arrival of agentic AI models in late 2025.

The paper also finds that the timing of this change is distinct from the arrival of ChatGPT in late 2022, which produced no detectable increase in submissions outside computer science:

> *'The acceleration of the aggregate after 2022 is [attributable] entirely to growth in the volume of computer-science and AI research; the period of widespread conversational LLM use left no detectable trace in the volume of submissions in other fields'*

Earlier generations of AI assistants therefore appear to have had little effect on overall scientific output, whereas the arrival of agentic systems apparently coincides with a substantial change in publishing activity.

While the evidence is circumstantial, the timing and the concentration of growth outside computer science appear to support the author's interpretation:

> *'The arXiv submission record, analysed without any attempt to detect machine-generated text, contains a distinct break in early 2026 that is separate from the growth of AI research, follows the arrival of agentic models, is concentrated in fields whose research can be carried out entirely at a desk, and is accompanied by a shift to single-author papers.'*

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The author suggests that arXiv's new 2-per-month limits on submissions per account may not succeed in containing the increase, since much of that additional material comes from a *growing number of scientists* submitting just one or two papers each, rather than a handful of unusually prolific contributors who can be 'rate-limited' by the new policy.

The author notes further that the surge in mathematics submissions raises questions about whether publication counts remain a fair measure of scientific achievement – particularly since the doubling of submissions does not necessarily indicate a corresponding increase in established findings:

> *'For mathematics in particular, the doubling of submissions within a year is an unprecedented change in the output of a field whose conventions of proof and review are among the most demanding in science; whether the additional papers represent a corresponding increase in established results is a question the submission record alone cannot answer, and one that the mathematical community is best placed to examine.'*

Conclusion

AI adoption is very much a secret revolution – not least in public and private research, where an unexpectedly anti-corporate public resolution to even one of the glut of pending AI lawsuits could affect the status of current research that has benefited from historical data (that's pretty much all of it).

Therefore, ironically, inference is all we have with which to estimate the effect that agentic AI is having on research in general – and particularly science research, where the variables are better-defined and more susceptible to automation.

So it's easy to dismiss the new paper as 'speculation'. But, as in any other branch of 'occult' history, once speculation is all you have, it gets upgraded to 'analysis'.

As for the 'lone wolf' scientist – well, most of the scientific disciplines where a maleficent sole creator could really do any damage are necessarily team-based anyway. And, in any case, this stereotype is clearly degrading, as agentic AI, and AI in general, is clearly offering unsupported or under-resourced voices a chance to be heard in the literature.

* *Titled 'Is the arXiv Apocalypse upon us? A break in preprint growth coincident with agentic AI'.*

† My substitution of the author's inline citations for hyperlinks.

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Writer on machine learning, domain specialist in human image synthesis. Former head of research content at Metaphysic.ai, until its dissolution into DNEG's Brahma.ai.
Website: martinanderson.ai
Contact: martin@martinanderson.ai