



UK Research
and Innovation

METASCIENCE NOVELTY INDICATORS CHALLENGE

ENTRANT HANDBOOK

September 2025

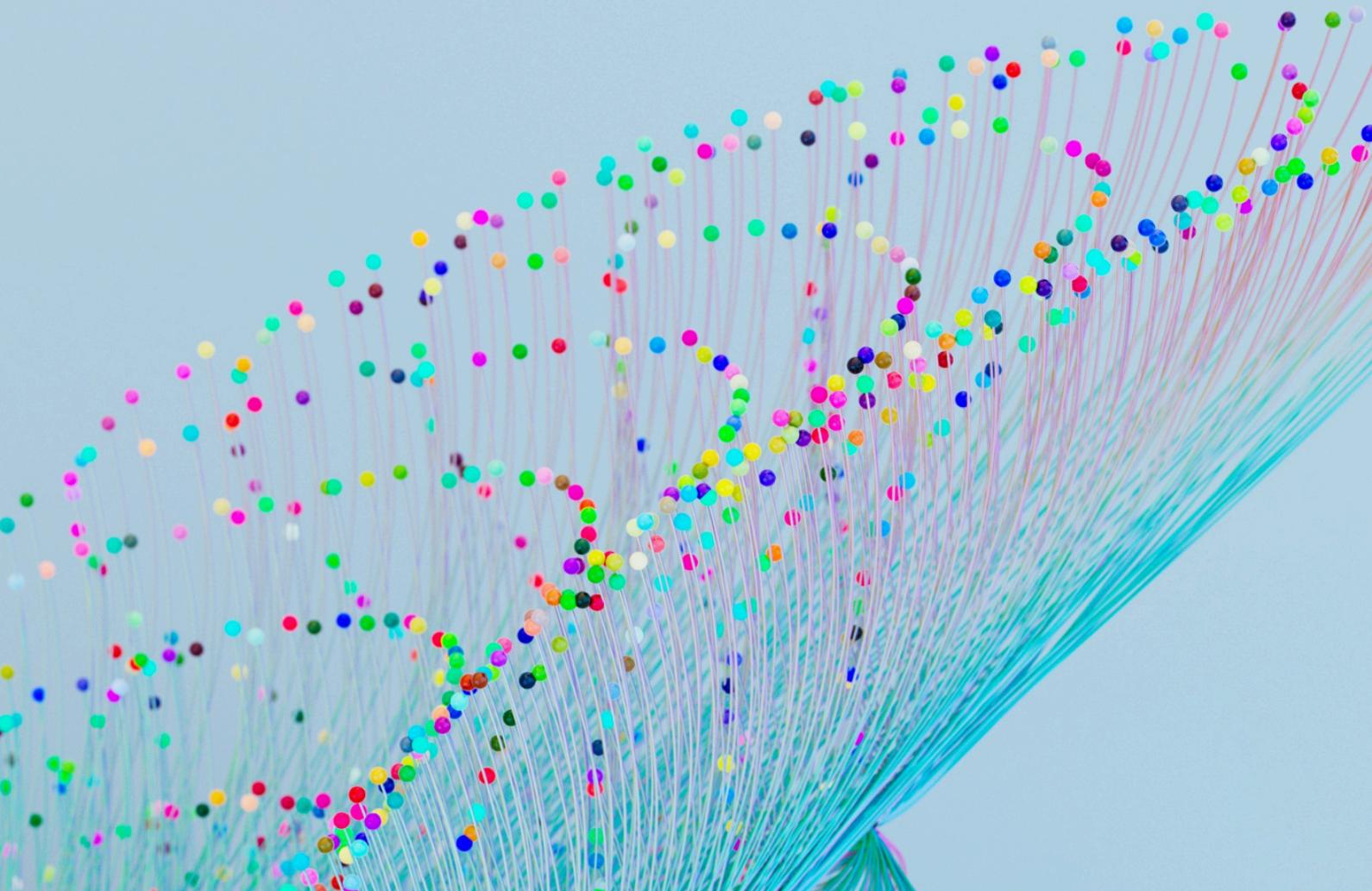


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GLOSSARY

Applicable at time of publication: the capability of assessing novelty of papers at the time of their publication, not their long-term impact (ex-post novelty), such as citation count.

Automated/Scalable: the capability to process and assess a high volume of papers without direct human intervention or with minimal manual effort from humans.

Challengers: participants in the challenge who have submitted an EOI and are accepted to compete in the challenge.

Dataset of expert novelty scores: a collection of expert-assigned novelty ratings for a sample of recent academic papers across various fields and disciplines. It will operate as the test environment for submitted indicators.

Entrant: an individual, team, organisation, or consortia who have expressed an interest in competing in the challenge.

EOI (Expression of Interest): the process where prospective participants make their submissions to become challengers.

Expert: an individual who possesses deep knowledge and experience in a specific field of research and can make informed judgments about the novelty of research.

Metadata: the list of all papers in the dataset (i.e. DOIs & Title), that will be shared with challengers.

Metadata Indicator results: the datasets submitted by challengers that include novelty scores for each of the papers included in the metadata.

Novelty: a key virtue often aligning with perceptions of "good research." We are intentionally not providing a prescriptive definition of novelty, as we want to avoid influencing challengers' approaches and allow for a broader interpretation.

Novelty Indicator: a scalable metric or methodology designed to identify and measure novelty in research.

BACKGROUND

What is the Metascience Novelty Indicators Challenge?

A global challenge to transform how we measure novelty in research.

The [Metascience Novelty Indicators Challenge](#) is a global initiative to develop and validate scalable indicators that can identify novelty in research. We invite academics, data scientists, researchers, and innovators worldwide to create and submit their novelty indicators to be validated against a dataset of human expert assessments – the best-performing indicator will win a prize of £300,000 alongside an opportunity to have their tool implemented in a real-world context.

Why are we running the Challenge?

Metascience indicators could have a profound impact on the global research ecosystem. Better, timely, and responsibly implemented indicators could shift researcher incentives, enhance our understanding of the factors that make excellence more likely, and in turn, improve the pace of scientific progress – ultimately, helping funders, governments, and academic institutions to yield more high-quality research out of limited resources.

At the moment, citation and journal-based indicators, albeit controversial, are widely used across the research and innovation ecosystem. In some ways, these measures do track our intuitions on what ‘good research’ is, but it is an open question whether they are able to capture a key virtue of research: **novelty**.

Metascience academics over the past decade have devised various measures of novelty, with numerous examples available in literature. These measures are gaining interest in the world of metascience but have not yet translated into mainstream use or acceptability in the wider research ecosystem. We think the main reason is that these measures are not yet validated at scale and across different fields of research; in particular, we don’t know that they cohere with our expert judgements of what novel research is. This sort of validation is expensive and technically challenging, but the **Metascience Novelty Indicators Challenge** is taking it on because we believe in the potential impact such an indicator could deliver.

The Metascience Novelty Indicators Challenge is **now** inviting individuals or teams who can generate novelty scores for scholarly publications across a wide range of disciplines to **express their interest in competing as a challenger**.

The winner of the **£300,000 grand prize** will be the challenger whose indicator **best** replicates human raters’ expert evaluations of research **novelty**. In particular, we are looking for scalable indicators that can be applied across a **wide range of academic disciplines**, and that can measure the novelty of a high volume of papers **at the time of their publication**. We are not looking for indicators that measure novelty by looking at a paper’s long-term impact (ex-post novelty), such as its citation count.

Who is Involved?

The Metascience Novelty Indicators Challenge is delivered through a unique consortium, bringing together:

The Metascience Unit launched the multi-partner research challenge, with the support of Elsevier. Open Philanthropy will be providing the £300,000 prize to the selected winner through Challenge Works.



UK Metascience Unit (UKRI)

UK Metascience Unit (UKRI) is a small team spanning the UK's Department for Science, Innovation and Technology and UK Research and Innovation, conducting bold experiments on funding processes; cultivating a larger and more policy-facing metascience research community; advancing global metascience through large, multi-actor projects; and contributing to an analytically enriched public science system.



Elsevier

Elsevier is a global leader in advanced information and decision support for science and healthcare. Elsevier believes that by working together with the communities it serves, human progress can be shaped to go further, happen faster, and benefit all.



Open Philanthropy

Open Philanthropy is a grantmaking organisation which aims to use its resources to help others as much as it can. Open Philanthropy is not involved in the running or administration of this prize, but will be providing the £300,000 prize to the selected winner through Challenge Works.

SPRU and RAND Europe have supported the conceptualisation, design, and implementation of the challenge in collaboration with the Metascience Unit, Elsevier, and Open Philanthropy.



RAND Europe

RAND Europe is a not-for-profit research organisation that aims to improve policy and decision-making in the public interest through research and analysis. RAND's clients include European governments, institutions, non-governmental organisations and firms with a need for rigorous, independent, multidisciplinary analysis. The Metascience Novelty Indicators Challenge is delivered as part of RAND Europe's Research and Innovation Ecosystems portfolio, which focuses on supporting the research community, industry and policymakers in the development of sustainable research and innovation ecosystems worldwide.



University of Sussex Science Policy Research Unit (SPRU)

With almost 60 years of experience, SPRU is internationally recognised as a leading centre of research on science, technology, and innovation policy. Founded in 1966 by Christopher Freeman, a pioneer of what is now known as innovation studies, SPRU was one of the first interdisciplinary research centres in the field of science and technology policy and management. Today, with over 60 faculty members, SPRU remains at the forefront of new ideas, problem-orientated research, inspiring teaching, and creative, high impact engagement with decision makers across government, business and civil society.

The challenge is being delivered by Challenge Works – a Nesta enterprise.



Challenge Works

Challenge Works is a social enterprise founded by the UK's innovation agency Nesta. Over the past decade, Challenge Works has facilitated over 100 challenge prizes, engaging more than 16,000 innovators and unlocking over £310 million in funding to tackle some of the world's biggest challenges. Challenge Works believes no challenge is unsolvable, partnering with non-profits, governments, and other organisations around the globe to unearth entrepreneurs and their innovations that can solve the greatest challenges of our time.

HOW TO BECOME A CHALLENGER

Expressing your Interest

To become a challenger, you must submit your Expression of Interest (EOI) entry by **23:59 (GMT) on 3 November 2025**.

SUBMIT YOUR EXPRESSION OF INTEREST 

You can find [a downloadable PDF version of the EOI here](#). Please note, you need to submit your EOI via Submittable (url: <https://challenges.submittable.com/submit>) to be considered for the challenge. We are unable to accept entries that are not submitted via Submittable. EOI entries must be written in English. We are unable to accept those not written in English.

The EOI entry includes questions about your team and its members, including contact details, a general outline of your indicator development and implementation plan, and your acceptance of the prize's Terms and Conditions.

EOI entries will be reviewed after the deadline, and entrants will be notified of whether they were successful, and invited to progress to the full challenge competition, in **mid-November**.

Please note that by being accepted as a challenger, you are not being endorsed by any of our challenge partners. Full eligibility and due diligence checks will take place after the final submission deadline on 23:59 (GMT) on 2 February 2026.

Before expressing your interest, please ensure that:

- You have read and understood the Metascience Novelty Indicator Challenge rules (this handbook)
- You have read and agree to the [Terms and Conditions](#) and [Privacy Policy](#);
- Your team meets the [eligibility criteria](#);
- Your entry is aligned with the [challenge statement](#).

*Please note, to submit a final submission and be considered for the grand prize, you must have entered an [EOI](#) by **23:59 (GMT) on 3 November 2025** and have been accepted as a challenger.*

HOW TO WIN THE CHALLENGE

The Challenge Statement

The Metascience Novelty Indicators Challenge is a global initiative to develop and validate scalable indicators that can identify novelty in research. We are challenging academics, data scientists, researchers, and innovators worldwide to create tools that could reshape how we evaluate novelty and thereby support scientific progress in the field of metascience.

The Metascience Novelty Indicators Challenge is open to individuals or teams who can generate novelty scores for scholarly outputs at the point of publication, across a wide range of disciplines, in a scalable, automated manner.

The winning indicator will be selected based on how they best meet the following conditions:

The winner of the Metascience Novelty Indicators Challenge will be awarded to the indicator that can achieve the highest level of accuracy towards the dataset of expert novelty scores.

The winning indicator must also be:

- Scalable: The Indicator should have the ability to efficiently and effectively process a high volume of publications across a wide range of academic disciplines. We expect the indicator to be automated and able to operate without high manual efforts.
- Applicable at time of publication: The indicator should have the capability to assess novelty of scholarly publications at the time of publication. We expect the indicator to measure the immediate novelty of new research papers. We are not looking for indicators that measure *ex-post novelty*, by looking at the long-term impact of a paper, i.e. indicators based on how many citations a paper will receive over several years.

The Dataset of Expert Novelty Scores

The winning novelty indicator will be the one that most accurately reflects expert judgements of novelty. To achieve this, we are currently developing a test environment in the form of a **dataset of expert novelty scores** for a sample of recent academic papers across all fields and disciplines. The development of this dataset is taking place between September and December 2025. We will share further details about the methodology used to generate this dataset and its characteristics following the completion of an initial pilot phase.

The challengers' goal will be to create a novelty indicator that generates novelty ratings that match those in our dataset as closely as possible. The dataset will be used to evaluate the performance of the indicators submitted by challengers for the final submission of the challenge. We outline our [timeline below](#).

Disclaimer

Please note that the expert novelty score dataset is being developed concurrently with the Metascience Novelty Indicator Challenge. The selection of the winner is contingent upon the expert novelty scores dataset being built successfully. Therefore, the challenge may be cancelled if unforeseen issues arise when building the dataset.

Final Submission & Winner Selection Process

Challengers will be expected to have developed a fully working indicator by the final submission deadline of **23:59 (GMT) on 2 February 2026**.

As part of the final submission, challengers will need to supply:

- Their set of novelty ratings for each paper in the dataset.
- A high-level description of how the indicator works, including underlying formulae.
- We may also request code as part of the final submission process.

The set of novelty ratings for the list of papers submitted by challengers for the final submission will be tested against the expert novelty score dataset. We are currently developing the best approach to delivering this test in a way that matches the characteristics of the expert rater dataset.

Challengers will be provided with a detailed description of this method alongside the metadata, which will be shared in **December 2025**.

TIMELINE

The Metascience Novelty Indicator Challenge runs from late **September 2025** to **April 2026**.

Individuals or teams who can generate novelty scores for journal publications across a wide range of disciplines must express their interest in competing as a challenger by **23:59 (GMT) on 3 November 2025**.

Successful applicants will be informed that they are an official challenger in mid-November, and will have until **23:59 (GMT) on 2 February 2026** to develop and refine their indicators.

In **December 2025**, the metadata used in the expert data set will be shared with challengers.

What metadata will be shared?

The metadata will include:

- a list of papers in our sample; we expect the sample size to be in the order of tens of thousands, and to span many fields and disciplines.
- further information about the format of the novelty scores (e.g. range utilised, presence of additional features such as confidence intervals etc.).

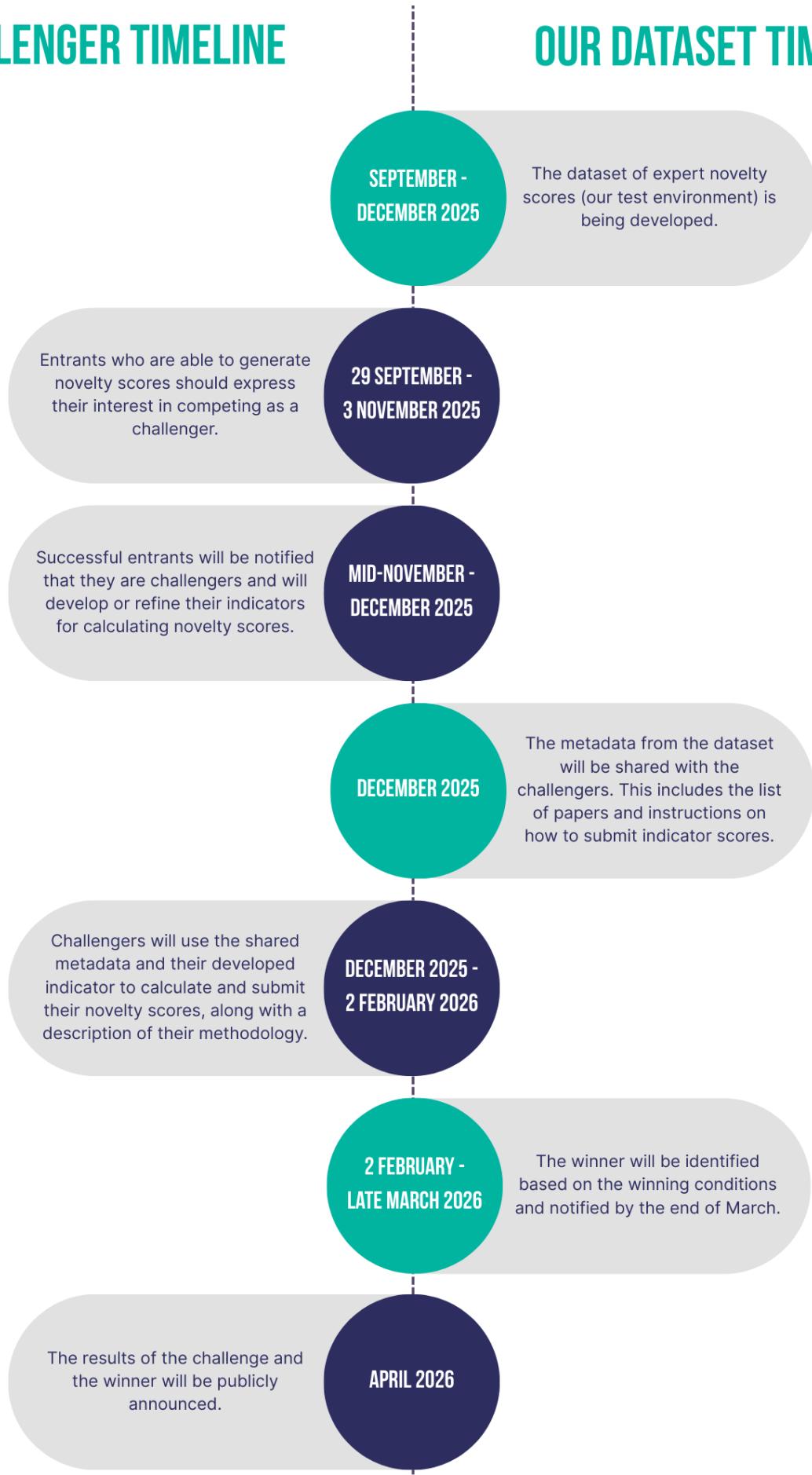
Challengers will generate novelty scores for each of these papers using their indicator.

By **23:59 (GMT) on 2 February 2026** challengers will submit their indicator results alongside a methodology description. Assessments will be based primarily on accuracy against the expert ratings.

The winning team will be informed in **March 2026**, and receive the **£300,000 grand prize** along with partnership opportunities to advance their new indicator and the opportunity to contribute to a peer-reviewed publication reporting the various indicators used in the challenge. The challenge results will be publicly announced in **April 2026**.

CHALLENGER TIMELINE

OUR DATASET TIMELINE



WHAT WE ARE OFFERING

As a **challenger**, you will have the opportunity to:

- Contribute to advancing the field of metascience, including research assessment and the measurement of novelty,
- Connect with leading researchers in metascience and bibliometrics.

The **winner** will also win:

- **Prize award:** The winner will receive a £300,000 grant to develop or commercialise their winning solution further.
- **Optional partnership opportunities to advance your new indicator:** The winning team will have the option to explore developing their indicator further across the scientific corpus. This is not mandatory, but the winner will be encouraged to explore product development with Elsevier and access their huge dataset for testing.
- **The opportunity to be featured within an academic paper:** The winner may be invited to contribute to a peer-reviewed publication reporting the various indicators used in the challenge.

Information about the academic paper

One of the key goals of the UK Metascience Unit is to advance the field of metascience and expand our knowledge of how to identify and measure novelty, with potential impacts in areas such as research assessment. Therefore, following the challenge, we will publish an academic paper describing its results, providing the field with crucial knowledge about how well various approaches to measuring novelty perform against expert assessments.

Our plan is to include the following information in the paper:

- A description of the various challenge entries, both in aggregate and in specific, independent of ranked performance. We will describe high-level cohort characteristics such as countries of provenance, types of indicator approaches etc.
- A description of the winning indicator, as well as several other entries of interest, such as runners-up (selected at the discretion of the challenge partner).
- Only high-level methodologies and scores of selected indicators (at the discretion of the challenge partners) will be shared, while keeping full algorithms confidential. Before publication, we will always take into account your concerns about confidentiality and intellectual property rights in your entry.
- A transparent and detailed description of the methods we used to generate the expert rater dataset and to rank indicators.

By submitting an EOI and your indicator entering the challenge, you will be agreeing to have your entry and its ranking featured on a 'leaderboard' on our website and in a major journal article about the challenge. Your participation and work could also be highlighted in public and academic events. You are free to publish separately about your entry.

WHO CAN ENTER

Who can enter to be a challenger?

The Metascience Novelty Indicators Challenge is open to individuals and teams who have already developed novelty indicators, or who possess the capability to deliver a fully working scalable indicator by **23:59 (GMT) on 2 February 2026**. Anyone with a smart idea and the technical skills required may enter, especially:

- **A university team** studying metascience and novelty in research
- **Postgraduates, PhD candidates and students** with relevant experience
- **Data scientists and researchers** working in bibliometrics, scientometrics, science of science, research on research, metascience, or related fields
- **Industry practitioners, non-profit research experts, or commercial entities with expertise** in research analytics

Our Eligibility Criteria

To be deemed eligible for the challenge, teams and individuals must meet the following eligibility criteria:

Eligible participants:

- **To submit an Expression of Interest (EOI):** Entries can come from organisations and individuals. All participants and team members must be at least 18 years of age. Individual contributors can submit an EOI, but they will need to confirm their organisation affiliation, or legally incorporate a new organisation, for the final submission on 2 February. Incorporation can be done during the period between submitting their EOI and final submission.
- **To submit a Final Submission:** Entries must come from legally incorporated organisations (e.g. private limited companies, non-profits, charities, universities). Team members must be at least 18 years of age.

Consortia entries:

Teams may enter as a single-lead organisation or as a consortium, but must nominate one organisation as the lead participant to enter. If successful, the lead participant organisation will be the one entering into a contract and receiving funding.

Geographical scope:

The Challenge is open to organisations worldwide, including academic groups, companies or non-profits, as well as partnerships between these. Organisations from the consortia may be based in a different country than the lead participant.

Employees of UKRI, DSIT, Elsevier, University of Sussex, RAND Europe, Open Philanthropy and Nesta, and their immediate families, are prohibited from entering:

Employees of Challenge Works (Nesta, or any company within the same group) or UKRI, Elsevier, University of Sussex, RAND Europe, Open Philanthropy and any immediate family of those employees, and any other individuals working on, or connected to, the Challenge are not eligible to enter. Individuals forming part of the Challenge Partners, and affiliated individuals supporting the creation of the expert novelty scores dataset in other organisations, are excluded from competing for the Challenge Prize.

Conflicts of interest:

Any conflict of interest or perceived conflict of interest, as more particularly detailed in the terms and conditions, may result in a participant being disqualified from participation. Conflicts of interest must be declared and mitigation agreed with Challenge Works.

In addition to these requirements, teams will need to confirm their affiliation and the legal entity acting as lead organisation to submit their final submission by 23:59 (GMT) on 2 February, and pass due diligence checks prior to receiving any award.

The lead organisation from the winning team will confirm the signatory (an individual from the lead organisation with signatory authority) who will enter into the winner's agreement. The prize award will be sent to the lead organisation's bank account.

What is expected of challengers?

Challengers are the individuals and teams who submitted an EOI before the deadline of **23:59 (GMT) on 3 November 2025** with a successful outcome allowing them to participate in the challenge.

Entrants will be notified of the outcome of their EOI in mid-November. Successful entrants will be onboarded as challengers, and be added to a mailing list to receive key details throughout the duration of the challenge.

Through submitting an EOI, team leads must confirm that their team will comply with all [Terms and Conditions](#) throughout the challenge.

We direct your attention in particular to these expectations:

- **Rights to develop the indicator:** Challengers must own or have permission to use the intellectual property of their solution throughout the challenge duration. For example, if you are an academic team entering as a newly incorporated company, you will need to ensure that the university has granted rights to you of both their background IP and the foreground IP, for submission through the challenge. The winning team will need to have rights to develop and deploy their indicator beyond the end of the challenge.
- **Multiple entries:** We accept multiple entries from the same organisation (e.g. the same university), but an individual can only lead one submission. An individual could be a team member in more than one team. Individuals working across multiple submissions must ensure they manage this arrangement and any potential conflict of interest responsibly through acting lawfully, ethically and in good faith.
- **Your Intellectual Property:** Your models remain yours, and how/what you choose to publish about your methodology and code will be up to you. It is expected that all competing challengers will be open to being [featured in a journal article](#) about the challenge.

Support to Enter

We have endeavoured to make the entry process as simple as possible, but you may still have questions. There are a number of ways that our team can support you.

- **Reasonable adjustments.** We are committed to making the entry process as accessible, efficient, and practical as possible. If any reasonable adjustments would support you entering, please contact noveltyindicators@challenges.org
- **Register your interest in joining a webinar.** If there is popular demand, we will schedule a webinar to talk you through the information in this entrant handbook, where you will have the opportunity to ask questions. Complete [this form to register your interest](#) in attending an upcoming informational webinar. If you cannot attend live, a recording will be made available after the event.
- **Email us.** If you still have queries, contact the team on noveltyindicators@challenges.org