

## Materials science

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**H**ope is not a strategy, as the aphorism for our times goes, but it can be a powerful motivator when searching for solutions to intractable problems. Many of the 79,000 papers in the Nature Index database that prompted this supplement offer it: in the idea, now reality, that new molecules with desired characteristics such as low toxicity can be designed at speed to replace harmful molecules used in existing products (see page S25), and in immunologically active nanomaterials that can 're-educate' the immune system to tackle cancer and other diseases (see page S18), for example.

Our tables (see pages S39–S42), based on papers published from 2015 to 2020 in the 82 natural-sciences journals tracked by the Nature Index, suggest a strong focus in some institutions and countries. For 5 of the leading 50 institutions in the field, materials-science-related research comprises more than half their output in the Nature Index, as measured by our key metric, Share (see note below). Three are in China, one is in South Korea, and the other is in Japan.

There's evidence, too, of growing competition in the field. In *Nature Index 2019 Materials Science*, 19 of the 20 institutions with the greatest increase in materials-science Share for the period 2015–18 were from China. For the period 2019–20, only 6 of them were Chinese, and 9 other countries also made the list. China, Japan, South Korea and Singapore all performed better in materials science between 2015 and 2020 than they did overall (across all subject areas) in our 2021 Annual Tables, especially South Korea (5th in the field, 8th across all subject areas) and Singapore (9th in the field, 17th overall).

We remind readers that the Nature Index provides only one indicator of research performance, and many other factors need to be taken into account when assessing the quality of research or institutions.

**Catherine Armitage**  
*Chief editor, Nature Index*

*\*Nature Index's metric, Share, is a fractional count for an article allocated to an institution, city or country/region, that takes into account the proportion of authors on the article whose institutional affiliation is with that institution or location. Bilateral collaboration score, another metric used, is the sum of the Share from articles with authors, countries/regions or institutions. For further explanation, see [natureindex.com/glossary](http://natureindex.com/glossary).*



**On the cover**  
Nickel oxide formed on a single-crystal nickel-based superalloy. Credit: Radostław Swadźba

## Contents

- S2 Where it matters**  
Tracking the performance of four heavyweights and a rising star in materials science.
- S4 Striking a balance with high-entropy alloys**  
Metal mixes create more efficient catalysts and better jet engines.
- S17 Light as a super-black feather**  
A paper inspired by the colouration of bird species has wide appeal.
- S18 How nanotechnology can flick the immunity switch**  
A new approach to treat autoimmune conditions, cancer and allergies.
- S23 Carving a path to a better future**  
Across the world, researchers are inventing and adapting materials for new systems and solutions.
- S34 Tiny steps to big energy savings**  
Researchers are rethinking the nature and potential of matter after layering ultra-thin ferroelectric materials.
- S36 Speed-sifting data for next big thing**  
Systems to make data standardized and accessible are key for screening new possibilities.
- S39 The tables**  
Leading institutions in materials science