

Materials in our time

As we launch the first physical sciences journal in the *Nature Reviews* family, we reflect on the relationship between human progress and advances in materials science.

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Human progress has always depended on the making and use of materials. Early *Homo sapiens* were limited to natural materials — more specifically, plant- and animal-derived products, and ore metals extracted from the ground they walked on. Despite the wide variety of naturally available molecules and endless ways they can be arranged to interact with each other, these natural materials provided a surprisingly narrow distribution of mechanical properties. Our ancestors expanded this limited profile by making composites, alloys and glasses — a drive that was prompted by their need to house, feed, protect and transport themselves. These inventions sparked mini-revolutions in their time and brought about major changes in human behaviour and society. History books tell the story.

In the twentieth century, discoveries led to a rapid increase in the number and variety of materials, particularly in the areas of ceramics and polymers. A world without these materials would be vastly different to the one we know today; from our cars to our kitchenware; from our clothes to our phones. The electronics industry also emerged during this time and continues to undergo incredible growth. A personal account of this world of device-inspired materials science over the past 60 years is told by Mildred Dresselhaus in a [Comment](#) in this first issue. It is evident that the major advances in materials science will emerge from societal needs and will be driven by appropriately skilled workforces coupled with the necessary financial backing and government support.

In 2016 — the launch year of *Nature Reviews Materials* — what are the key areas in which materials science is making an impact? Alongside the importance of materials in electronic devices, the need for functional materials to improve energy storage and harvesting, and to monitor and maintain our health

are at the forefront of many research programmes. In the Reviews and Comments articles in this issue, we aim to cover these themes. In his [Comment](#), Julian Allwood discusses the role of materials in a sustainable future and outlines the challenges for the increased engagement of materials scientists in public debate on the topic. Reviews on the use of computational design of energy materials ([A. Jain *et al.*](#)) and the latest advances in hybrid organic–inorganic perovskites for photovoltaic devices ([T. M. Brenner *et al.*](#)) provide insight into areas of research that are of critical importance in realizing a low-carbon energy future.

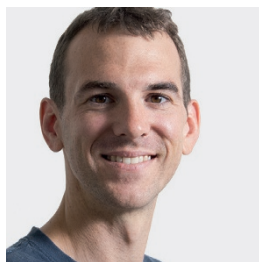
From a healthcare perspective, Darrell Irvine offers an opinion on the state-of-play of materials within the fields of immunology and immunotherapy (see [Comment](#)). This is complemented by a Review ([P. S. Briquez *et al.*](#)) highlighting the design principles required to produce pro-angiogenic materials. Also in this Issue, another Review ([M. J. Kreder *et al.*](#)) discusses the formation of superhydrophobic and icephobic surfaces; the need for such materials is important in a range of everyday settings from air-conditioning systems in buildings to our car windscreens. And last but by no means least, we feature a Review ([Y. Segawa *et al.*](#)) detailing the bottom-up, atomically precise fabrication of carbon nanostructures from small molecules.

In the Reviews and Comments sections, we aim to cover the principal themes that motivate materials scientists and are of societal importance. In subsequent issues, our readers will witness the breadth of topics expand to encompass colloidal materials, hydrogels, porous materials, ionic liquids and metamaterials, to name but a few. In addition, in the form of Research Highlights written by the editors, we will put the spotlight on selected papers from the primary research literature.

Nature Reviews Materials is the first foray of the *Nature Reviews* family into the physical sciences. Our Reviews — commissioned and enhanced by the editorial team and produced with high-quality graphics drawn by dedicated art editors — will provide an informative introduction to materials scientists embarking on a new topic of investigation, while offering thought-provoking, in-depth analysis for the seasoned researcher. We hope that you enjoy reading the first issue of *Nature Reviews Materials*, and welcome your feedback.



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