Biomimetics—what is it and what can it offer?

For many centuries, man has looked to nature for inspiration in art and science. In recent years, however, more concerted efforts have been made to emulate desirable features in plants and animals in new technologies. This is partly due to the realisation that biology has developed smart solutions to challenges presented to organisms by their environments through millions of years of natural selection. This rapidly-growing field, biomimetics, is increasingly leading to the development of new technologies. Biomimetic technologies are frequently regarded as offering more sustainable solutions to problems than do more traditional routes to product and process innovation. Plants and animals, it seems, make far less use of energy when solving problems than does technology. The possible reasons for this will be explored. Furthermore, biology tends to introduce more functionality and robustness into materials, structures and processes. In this introductory talk, I will expand on the reasons why biomimetics can contribute to sustainability across a wide range of industries and illustrate how biomimetic technologies are adding value in product and process development. I will demonstrate how analyses of publication and patenting activity and membership of academic networks can chart the growth of the discipline.