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Multiscale Modelling at the Physics–Chemistry–Biology Interface

A theme issue compiled and edited by P. V. Coveney, J. P. Boon and S. Succi

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About this issue

One of the most important questions in modern science is how to understand the behaviour of complex systems, whether in physics, chemistry or biology. We understand that such complexity originates from the interactions between processes that take place on multiple length and time scales. This takes us outside the traditional realm of scientific inquiry where attention is focused on a single length and time scale, instead obliging us to find ways of combining such descriptions in order to gain an understanding of global behaviour. Such behaviour is widespread in physics, chemistry and biology. This issue shows how a common conceptual framework is emerging which allows us to describe complexity throughout science in a systematic manner. The issue also considers so-called big data approaches designed to describe such complex systems and argues that, without due attention to their intrinsic theoretical underpinnings, they are likely to fail.

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