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Preface

The tendency of people to take small things as important has resulted in many great things.  
G.C. Lichtenberg

Aberration-corrected electron microscopy is a key term in the headlines of numerous research reports which involve state-of-the-art electron microscopy equipment. The implementation of spherical aberration correctors in transmission electron microscopes has directly and indirectly enabled revolutionary applications which a little more than ten years ago would not have been feasible or even thinkable. Nonetheless, aberration correction is not the only advancement which enables the realization of experiments that can be carried out in electron microscopes. Besides aberration correction, electron microscopes have been brought to applications which, for instance, provide temporal resolution to study dynamics on the nanosecond scale. Another branch of instrument development focuses on in situ measurements. Devices have been realized which enable the study of materials and their evolution in liquid media or in controlled gaseous atmospheres, or which make it feasible to monitor the very basic deformation mechanism of materials. This involves the controlled deformation of nanometre-sized objects. Furthermore, many of the analytical capabilities of electron microscopes can nowadays be considered to be comparable to dedicated analytical instruments, which, however, do not provide the unique spatial resolution that is inherent for electron microscopes. Yet, spatial resolution is often indispensable for systematically analyzing complex nanostructured materials. Of course, there are many more directions in the development of state-of-the-art electron microscopy equipment. Nevertheless, many of these developments can potentially benefit from aberration-corrected electron optics. As such, the resolution-limiting aberration of conventional electron microscopy has to be considered as one of the great inventions which has advanced materials science and our experimental understanding of matter. There is no reason why this trend should not be continued.

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