Luminescence dating –what is it, what can it do, and why is it important?

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The Earth' s surface is an archive of the history of our species and of our environment but to read and interpret the information recorded in this archive, we must have a means of knowing when the various records were preserved, and so when the events actually happened. Luminescence dating is an important and widely-applicable chronological tool used to date these records. The technique is not new, but recent developments have led to an explosion in applications, so that today it is one of the three most widely used methods in the geo- and archaeo-chronology of the last 500,000 years. This talk outlines the principles of the method, and discusses the advantages and limitations of the most widely-used form, optically stimulated luminescence (OSL) dating. Evidence for the precision and accuracy of the method is presented. The importance of the technique to studies of human evolution and migration, and to our understanding of past climate change is then illustrated using studies ranging in scale and time from the recent bioturbation of mudflats to late Quaternary ice advances in Eurasia. Finally, exciting new developments in rock surface dating are summarised.

It is concluded that OSL dating in its various forms is the most widely applicable dating tool available to earth scientists and archaeologists. It has grown from being relatively minor and unimportant to become one of the three pillars supporting modern archeo- and geo-chronology, and despite nearly 60 years of development, new signals, new techniques and new applications are constantly appearing. It continues to be a very exciting field in which to work.

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