

# **OPTICAL DATING: History and Theory of the Method and its Application to Research in Geomorphology, Quaternary Geology, and Archaeology**

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Luminescence dating, which includes thermoluminescence (TL) and optical dating, consists of a collection of numerical-age techniques that are among the most important chronological tools currently used in Quaternary research. In this talk, I will review concisely the key basic principles of luminescence dating and its historical developments, from its roots in TL dating of heated minerals to the development of optical dating methods for sunlight-exposed sediments. I will discuss the feasibility of some of the techniques commonly used in luminescence dating, including multiple-aliquot, single-aliquot, and single-grain procedures, and how they can be applied to solving various problems in environmental science.

*About the author:*

Olav Lian grew up on the North Shore of Vancouver, at the fringe of the Coast Mountains. In 1986 he began working as a research assistant in the Thermoluminescence Dating Laboratory (physics department) at Simon Fraser University, under the mentorship of D.J. Huntley (the inventor of optical dating) while completing his BSc in physics, which he was awarded in 1988. In 1991 he completed an MSc degree physical geography, also at Simon Fraser University, and, after nearly two years of teaching, he joined the Department of Earth Sciences at University of Western Ontario where he completed a PhD in geology in 1997. He was then hired by the Research School of Earth Sciences at Victoria University of Wellington (New Zealand) as a research fellow in geology where he directed New Zealand's first luminescence dating laboratory. In the spring of 1999 he returned to Simon Fraser University and worked as a research associate in its physics department until 2002. This was followed by a permanent faculty position in the Geography Department (Centre for Quaternary Research) at Royal Holloway, University of London (UK), where he directed its geochronology laboratories. In early 2005 he escaped the high cost of living in southern England and returned to Canada to take up a post as a faculty member in the Geography Department at University of the Fraser Valley where he built a new luminescence dating laboratory. He currently holds three adjunct professorships: two at Simon Fraser University, one in of Geography and the other in Earth Sciences; and the third one is in the Department of Geography at the University of Victoria.

Dr. Lian has been invited to speak about his research on numerous occasions in New Zealand, Australia, Canada, United States, and the United Kingdom; invited seminars have included one Oxford University in 2003, a Geological Survey of Canada Logan Club Lecture in 2006, and in 2011 at NASA's Ames Research Center. In 2012 he was awarded University of the Fraser Valley's Research Excellence Award and he was invited to be a "Distinguished International Visitor" in the Geography Department at Durham University in England.