

## Press Release

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Hanover, 17th of September 2018, 11:30 a.m.

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### **Unearth the true age: LIAG scientist is awarded a prize for contributions to ESR and luminescence dating**

The *Japanese Quaternary Association* awarded a prize to Dr. Sumiko Tsukamoto of the Leibniz Institute for Applied Geophysics (LIAG, Hannover) for her outstanding research in the field of age determination of sediments with electron spin resonance (ESR) and luminescence dating methods at the annual meeting in Japan. The meeting was held in Tokyo from 24th to 26th of August, 2018.

ESR and luminescence dating are physical methods that are relevant for a multitude of possible applications. Among others, they are employed to determine the age of sediments. Archeologists use this information to date finds and their geological horizons. Based on the age data of sediments, geoscientists continually expand their knowledge about the climate of the most recent geological era, the Quaternary, and by this help to improve future climate models.

Dr. Tsukamoto introduced optically stimulated luminescence dating (OSL) in Japan and is now an expert of both methods. By the means of luminescence dating, the age of sediment samples may be determined more precisely. There is just one problem. If the sediment is older than about 300.000 years, the method is very imprecise. This is when ESR is applied, as this method may uncover the age of samples that are up to 2 million years old.

„Both methods are complementary“, says Dr. Sumiko Tsukamoto. „This is what we benefit from in our current research project *DeepRoots*, which we are working on in cooperation with the University of Liverpool.“

In the interdisciplinary project *DeepRoots*, archeologists, geographers, and dating experts examine sediment samples taken from geological horizons, in which tools from the Early and Middle Stone Age are found. The aim is to learn more about our ancestor *Homo heidelbergensis*, who lived some 600.000 to 200.000 years ago in Europe and Africa. The sediment samples examined are from Zambia. Previous research on samples from this area, which were dated by luminescence methods, demonstrated that the age of these finds is around 500.000 to 300.000 years. ESR-dating is hoped to reveal a more precise age of the finds from Zambia.

**Institute:**

The Leibniz Institute for Applied Geophysics (LIAG) is an independent research institute and a member of the Leibniz Association. LIAG conducts research on the upper part of the Earth's crust. The focus of our work is to explore structures and processes in the subsurface by using geophysical methods. For this purpose, we develop and optimize measurement techniques as well as processing, modeling, and inversion methods. LIAG has more than 50 years of experience in the field of geophysical research. In the laboratories of Section 3 "Geochronology", the age of sediment sequences is examined by using geochronological methods such as ESR- and luminescence dating.

**Additional information:**

<https://deeproootsafrica.blog/>

**Additional material:**

2 photos

**Contact:**

Dr. Sumiko Tsukamoto  
e-mail: [sumiko.tsukamoto@leibniz-liag.de](mailto:sumiko.tsukamoto@leibniz-liag.de)  
phone: 0511/643-2799

**Additional material**



Prize of the *Japanese Quaternary Association*  
Photo from Prof. Dr. Okumura, Hiroshima University in Japan



Tool of *Homo heidelbergensis*  
Photo from Leibniz Institute of Applied Geophysics