



## Cilva Joseph

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### Brief Summary

Xenotime ( $\text{YPO}_4$ ) is an accessory phase common in low to high temperature environments. Xenotime has been used as geochronometer due to its high concentration of U and Th, low contents of common Pb and resistance to radiation damage. Xenotime provides age information on diagenesis, hydrothermal events, igneous and metamorphic processes. Even though xenotime has great potential, its small size and lesser modal abundance in rocks made it less preferable over accessory minerals such as zircon and monazite.

In this research, it is proposed to conduct a nanoscale study of xenotime and its potential geological applications using Atom Probe tomography and correlative microscopy. This approach will be applied to investigate trace element mobility during metamorphism and establish the age of targeted micron to sub-micron phases and textures previously inaccessible by conventional techniques in order to answer large-scale geological questions.

In order to achieve this, xenotime reference materials will be analysed to define the capabilities of the technique, include detection limits and precision and later will be applied to xenotime samples selected from challenging geological settings.

**Education:** BS and MS from Mahatma Gandhi University, Kerala, India.

**Research interests:** Geochemistry, nanogeochronology, xenotime, Atom Probe Tomography

**Thesis title:** Nanoscale geochemistry and geochronology of xenotime: application to Earth sciences

**Supervisors:** Dr. Denis Fougereuse, Prof. Steven Reddy

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