



## EAG-GS Outreach Program 2013



### Lecture Abstract:

#### In search of rare elements: mining for cell phones

Bernhard Wehrli, Swiss Federal Institute of Technology, ETH Zurich and Eawag, Swiss Federal Institute of Aquatic Science and Technology, Switzerland. [wehrli@eawag.ch](mailto:wehrli@eawag.ch)

Some rare elements like tantalum and indium are critical ingredients for manufacturing electronic components in modern devices such as cell phones, touch screens or digital cameras. These elements are not easy to substitute due to the extraordinary properties of new materials such as miniaturized capacitors based on tantalum oxide, or transparent conducting layers made of indium-tin oxide. As a consequence of



Coltan from artisanal mining

(Karen Hayes)

<http://tanb.org/coltan>

increasing demand in the consumer electronics sector the prizes of these elements dramatically increased over the last years. In this lecture, we review the geochemical behaviour, the common mineral forms, the refining, application and the potential for recycling of indium and tantalum. The specific exploitation of minerals such as coltan in Central Africa is a new phenomenon, therefore only preliminary information is available on the potential environmental impact of their mobilization. There is increasing international pressure, however, to use only “conflict-free minerals”. Geochemical know-how was always critical for identifying interesting mineral deposits. More recently, geochemical and isotopic fingerprinting provides important tools for tracing the origin of precious minerals.



Ceramic capacitors for electronic devices