

## **NEW ADVANCES IN ELEMENTAL X-RAY IMAGING: THE CHEMICAL FOSSIL**

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X-ray fluorescence spectrometry has been used since the early 1990s to generate elemental X-ray images (EXI) of chemically non-uniform and irregular shaped materials. Elemental X-ray area maps (EXAM) have helped material scientists to understand the chemical and physical processes encountered during fabrication. Recent advances at the Stanford Linear Accelerator Center (SLAC) have dramatically improved the scan rate and the data acquisition time for obtaining EXAM images. The EXI unit at SLAC has reduced the time to acquire EXAM images from weeks to hours. High resolution EXAM images can now cover large areas to reveal new insights into how life existed millions of years ago through the exciting world of "The Chemical Fossil." This presentation describes the experimental design of the EXI unit at SLAC. Many of the EXAM images that have given paleontologists a new perspective about the history of life on Earth as well as a better understanding of the fossilization process will be shown.