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# Synchrotron light and ore geology research

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The world's future supply of crucial metals hinges on sound scientific research and geological discovery. To this end, researchers and industry experts apply a range of traditional techniques such as microscopy, whole-rock geochemistry, and field mapping (among others). However, the world's easily-discovered resources have been exhausted and new mineral discoveries are becoming more difficult to uncover. Geoscientists must thus apply increasingly specialised and novel study techniques towards locating and optimally exploiting future resources.

Synchrotron techniques represent one approach that can advance this ultimate goal. Already, several research groups have applied synchrotron techniques towards understanding the micrometer and submicrometer scale mineral associations between ore minerals and the host rock (i.e., using synchrotron XRF). Similarly, the complexation and solubility of crucial metals within geological fluids are now better understood through insight obtained using synchrotron XANES and EXAFS analyses. These techniques further advance our understanding of trace metal coordination within mineral structures (e.g., gold in pyrite, silver in galena, germanium in zinc).

For southern African researchers to remain at the forefront of the global trends in geological research, it is crucial that they become familiarised and indeed, start to employ these high level synchrotron techniques towards their research questions. The current contribution critically reviews the global trends in synchrotron use for ore geology research. Key findings, and anticipated future directions will be highlighted during the seminar.

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