Scientists create super X-rays

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A new X-ray laboratory at the University of Melbourne houses the most powerful X-ray machine in Australia.

Professor Christopher Chantler and his team at the School of Physics have built a new rotating anode source that turns ordinary X-rays into super X-rays.

After the synchrotron, which is a different type of technology, this is one of the most powerful scientific tools to investigate atoms.

"This super X-ray machine gives us the capability of mapping the energies of the atom previously inaccessible and unseen by other apparatus," said Professor Chantler.

The device is already of interest to chemical, biological and physical scientists as it can enhance investigations of chemical environments, the interaction of light with matter, and link to studies of complex mineral formation in the earth's crust.

The research team tested the super X-rays on copper atoms and demonstrated unprecedented levels of accuracy at the atomic level that has never been seen before.

Professor Chantler and his team recently published the copper atom data in the Journal of Physics B. The data shed new light on the theoretical calculations and theoretical electron scattering models.

"This copper atom data also means we have provided new insights into calibrating less powerful X-ray machines with much higher accuracy."

The new X-ray laboratory will train a new generation of students as a stepping-stone for exciting opportunities at synchrotrons and free electron lasers.

Dr Sobott, one of the awardees of the prestigious Bill Gates Humanitarian award winner said, 'The real value of the rotating anode is that it opens up new scientific experimentation. This is particularly the case for high statistics, high precision measurements required by our group as we strive to probe the nature of matter."

"We are thrilled that the super X-ray has industrial representatives from scientific instruments makers and imaging companies interested about future opportunities for commercial development," said Professor Chantler.

Provided by University of Melbourne