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## Mining Technology Division News

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*Bob Siddall*

If any member has interesting news about mining or personel in their particular area please contact the Editor of Materials World [Katherine Williams](#) at 1 Carlton House Terrace, London.

## Latest News

### Extraterrestrial gems

A team of scientists from Florida International University (FIU) and Case Western Reserve University (CWRU), USA, have put forward a theory that carbonados – black polycrystalline cuboid diamonds – come from outer space.

Funded by the National Science Foundation (NSF) and DeBeers, USA, the project was led by Professor Stephen Haggerty of FIU. His team consisted of PhD student, Jozsef Garai from FIU, Professor Mark Chance and Dr Sandeep Rekhu, from CWRU. The team structurally characterised the carbonados – found exclusively in Brazil and the Central African Republic, both on the West Congo-Salvador craton – using spectral analysis and synchrotron diffraction to reveal their natural origin.

'The spectra of carbonado diamond mostly depict the presence of single nitrogen impurities and hydrogen, says Garai. The lack of identifiable nitrogen aggregates in the infrared spectra, the presence of features related to hydrocarbon stretch bonds and the resemblance to presolar diamonds indicate that carbonado diamonds formed in a hydrogen-rich intersellar environment.'

The results showed that black diamonds are sintered and porous structures with reduced metals, metal alloys, carbides and nitrides fractions, and the absence of any terrestrial mineral inclusions. The team have concluded that the diamonds were once the size of asteroids, a kilometre or more in diameter, when they first landed on the Earth. 'Conventional' diamonds are transported from Earth's interior from depths of more than 180km in highly explosive, rapidly injected magmas known as kimberlites,' says Haggerty. Interest in carbonados is wide, historically they were used by the French to carve and sand hardwood. They are sought after in industry as cutting and drill tools due to their superior toughness under stress compared to the terrestrial analogue. In addition, understanding the way in which they were created may enable geologists to locate more and help diamond makers synthesise the rare gems.

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