

- Search NSLS
- Find people (by last name)
- [Advanced search](#)
- [About the NSLS](#) ▶
 - [NSLS Newsroom](#) ▶
 - [Facility Information](#) ▶
 - [User Information](#) ▶
 - [Safety](#) ▶
 - [Training](#) ▶
 - [A-Z Index](#)
 - [Directory](#)
 - [Job Opportunities](#)
 - [Contact Us](#)
 - [NSLS UEC](#)
 - [NSLS-II](#)
 - [BNL](#)

February 21, 2007

Diamonds from Outer Space: Geologists Discover Origin of Earth's Mysterious Black Diamonds

If indeed "a diamond is forever," the most primitive origins of Earth's so-called black diamonds were in deep, universal time, geologists have discovered. Black diamonds came from none other than interstellar space.

In a paper published on December 20, 2006 in the journal *Astrophysical Journal Letters*, scientists Jozsef Garai and Stephen Haggerty of Florida International University, along with Case Western Reserve University researchers Sandeep Rekhi and Mark Chance, claim an extraterrestrial origin for the unique black diamonds, also called carbonado diamonds.

Infrared synchrotron radiation at Brookhaven National Laboratory was used to discover the diamonds' source.

"Trace elements critical to an 'ET' origin are nitrogen and hydrogen," said Haggerty. The presence of hydrogen in the carbonado diamonds indicates an origin in a hydrogen-rich interstellar space, he and colleagues believe.

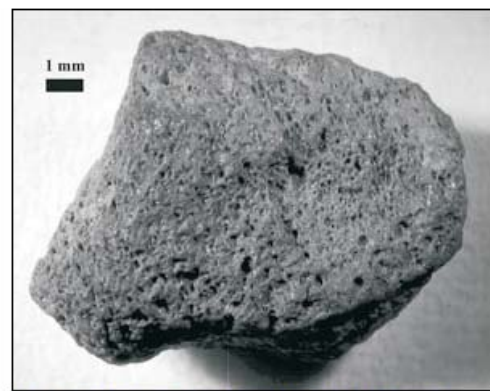
The term carbonado was coined by the Portuguese in Brazil in the mid-18th century; it's derived from its visual similarity to porous charcoal. Black diamonds are found only in Brazil and the Central African Republic.

"Conventional diamonds are mined from explosive volcanic rocks [kimberlites] that transport them from depths in excess of 100 kilometers to the Earth's surface in a very short amount of time," said Sonia Esperanca, program director in the National Science Foundation's Division of Earth Sciences, which funded the research. "This process preserves the unique crystal structure that makes diamonds the hardest natural material known."

From Australia to Siberia, from China to India, the geological settings of conventional diamonds are virtually identical, said Haggerty. None of them are compatible with the formation of black diamonds.

Approximately 600 tons of conventional diamonds have been mined, traded, polished and adorned since 1900. "But not a single black/carbonado diamond has been discovered in the world's mining fields," Haggerty said.

The new data support earlier research by Haggerty showing that carbonado diamonds formed in stellar supernovae explosions. Black diamonds were once the size of asteroids, a kilometer or more in diameter when they first landed on Earth.



Black, or carbonado, diamonds, came from outer space, geologists have discovered. (Courtesy Steve Haggerty)

The research in this news release, which was distributed by the National Science Foundation, was performed at Brookhaven's National Synchrotron Light Source. At beamline U2B, which is operated by the Case Center for Synchrotron Biosciences, of Case Western Reserve University, scientists used infrared light to analyze the diamonds' elemental makeup.

SCIENCE WRITER: [Cheryl Dybas](#) (NSF)



The National Synchrotron Light Source at Brookhaven National Laboratory in New York, is a national user research facility funded by the U.S. Department of Energy's Office of Basic Energy Science. The NSLS operates two electron storage rings: an X-Ray ring and a Vacuum UltraViolet (VUV) ring which provide intense light spanning the electromagnetic spectrum from the infrared through x-rays. Each year over 2300 scientists from universities, industries and government labs perform research at the NSLS.

[Privacy and Security Notice](#) | [Contact Webmaster](#)