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## UBC scientist makes a stunning find

**Astronomer discovers the most distant stars ever seen**

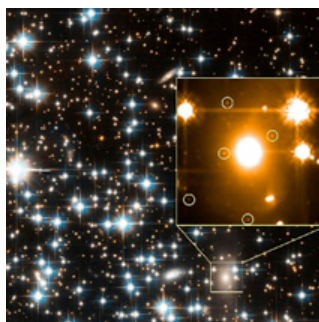
**Nicholas Read, Vancouver Sun**

Published: Wednesday, January 10, 2007

A University of B.C. astronomer has discovered the farthest cluster of stars ever seen by a human eye -- a find he hopes will reveal secrets about the formation of the universe.

Two months ago, Harvey Richer and Jason Kalirai, a former PhD student who now works for the University of California, Santa Cruz, used NASA's Hubble telescope to see a cluster of stars one billion light-years from Earth. A light-year is roughly the equivalent of nine trillion kilometres.

They will present their discovery today at a meeting of the American Astronomical Society in Seattle.



**A view of a small field within one Milky Way globular star cluster as observed through the Hubble telescope.**

NASA, ESA, H. Richer (UBC), Jason Kalirai (UCSC)

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"This is by a factor of 10 the most distant system of star clusters that anyone has ever seen," Richer said in a telephone interview Tuesday.

Or put another way, the cluster -- which has no name, only spatial coordinates -- is "seven per cent the way across the

universe from us."

That's interesting, he explains, because given that light travels at a finite speed -- 300,000 km a second -- the light emitted from the star cluster he and Kalirai saw was emitted one billion years ago. That means the cluster as it appeared to them two months ago was the way it looked one billion years ago. In other words, they were looking one billion years back in time.

Now they hope to compare that cluster of stars with the clusters that surround our own galaxy, the Milky Way, and see if there are any differences. If there are, that will tell them something about how the universe evolved.

"The excitement here is that we now see this system as it was a billion years ago. So we can look at the system around us, and we can try to understand the evolution of galaxies, because we see the two at different epochs -- a billion years ago and today."

It's too early to say what those differences are, Richer said, but he expects there will be several -- colour among them. That's because the older a star gets, the redder it gets, he says. Younger stars are bluer.

So given that the cluster they discovered appeared to them as it was a billion years ago, he expects the stars in it to be bluer than those closer to us.

Last year in Prague, Richer had the distinction of introducing to the International Astronomical Union the first hard evidence of when the first stars formed -- about 12 billion years ago, or a billion years after the universe began.

He did that by identifying and photographing the faintest stars ever seen, because the fainter a star is, the older it is.

Thus, today's revelation represents the second in a one-two astronomical punch for the Montreal-born Richer who has been at UBC since the 1970s.

Richer and Kalirai made their discovery by examining what they thought was a star cluster closer to our galaxy. But photographs kept showing them a concentration of stars that shouldn't have been there.

It turned out this concentration was the cluster they now have identified as the furthest ever seen.

The first stars were born only when the universe was cool enough to accommodate the forces of gravity, Richer explained last year in Prague. That happened about a billion years after the so-called big bang, when hydrogen and helium began to collide, causing explosions that generated light and produced tangentially all the other elements in the periodic table.

"You and I are star stuff," Richer said then. "The carbon and oxygen you're breathing now was at one point the interior of a star."

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