

Far off galaxy provides close up on universe's origin

Astronomers at the W. M. Keck observatory on Mauna Kea in Hawaii have discovered an object that is 12.22 billion light years away, reported John

Light travels through space at a constant speed, six trillion miles per year. This means the light emitted from RD1 now reaching earth is 12 billion years old.

"It [the light from distant galaxies] is a time machine, the farther you look away the farther you look back in time," said Bennett Link, Montana State physics professor.

Distant galaxies provide a window into the past by allowing astronomers to view objects that formed long before the earth.

The universe is believed to be up to 17 billion years old. This calculation is based on the expansion rate of the universe, first observed by Edwin Hubble in 1929, wrote Wendy Freedman in the May 1998 issue of Scientific American Quarterly.

Just after the big bang, the universe was "expanding very quickly," Link said. "Getting the expansion rate accurately is very difficult."

This variable expansion rate accounts for the uncertainty of the universe's age.

The age of galaxies is determined by using spectral bands in the light they emit. When passed through a prism, light separates into a spectrum with signature bands revealing both composition and velocity, Link explained.

Laboratory experiments have recorded the shift in spectral bands of hydrogen and helium when the source travels at different velocities. The shift of the spectral bands, or the red shift, of light from a distant galaxy is compared to shifts observed in the lab to determine velocity.

The red shift of RD1 indicates that it is traveling at 90 percent the speed of light, Link added.



By Annika Wallendahl
Exponent Science
Columnist

Yaukey in the Honolulu Advertiser last week.

The luminous object, named RD1, is believed to be an infant galaxy that is 90 million light years further away from Earth than the previous record holder.

By comparison, at 2.2 million light years away, Andromeda is the closest galaxy.

Dockery: Professor provides friendship

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fyng thing across disciplines." He stated an example of this by saying, "If you've solved a problem in math, you've solved a problem in biology." He views this understanding of math's importance in other areas as especially significant at a school where engineering is so prominent.

"Abstraction is a useful tool," he said. "If you look at things in an abstract way, you can solve a lot of problems."

Last semester Dockery designed a "Software for Mathematics Computation" course. Dockery goes "that extra mile, bringing in those things from outside," said Griffiths. He stated this is exactly what makes Dockery such an asset to his students.

Esty said Dockery designed the course, came to class the first day with a list of math software and asked what the stu-

dents wanted to learn. The rest of the semester focused on their selections.

This course is now a requirement for math majors.

In order for students to further their own education, "the primary thing is to have a genuine interest in the subject matter," said Dockery.

"I don't know anyone who doesn't enjoy Jack's classes," Griffiths said. "He is really good one-on-one when you go to see him." Griffiths said he has made use of Dockery's knowledge and accessibility for assistance both in math classes and in developing his own focus in mathematics.

Dockery is "as much a friend as a professor," Griffiths said.

Faculty, staff and students in the math department agree Jack Dockery truly deserves this award.