One-third of Milky Way stars have changed orbits: Study

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New York: Nearly a third of the stars in our own galaxy have dramatically changed their obits, say scientists who have created a new map of the Milky Way.

"In our modern world, many people move far away from their birth places, sometimes halfway around the world," said lead author of the study Michael Hayden from New Mexico State University in the US.

"Now we are finding the same is true of stars in our galaxy -- about 30 percent of the stars in our galaxy have traveled a long way from where they were born," Hayden noted.

Evidence of stellar migration had previously been seen in stars near the Sun, but the new study is the first clear evidence that migration occurs throughout the galaxy, the researchers noted.

To build the new map of the Milky Way, the scientists used the Sloan Digital Sky Survey (SDSS) telescope's Apache Point Observatory Galactic Evolution Explorer (APOGEE) spectrograph to observe 100,000 stars during a four-year period.

The key to creating and interpreting this map of the galaxy is measuring the elements in the atmosphere of each star.

"From the chemical composition of a star, we can learn its ancestry and life history," Hayden noted.

The chemical information comes from spectra, which are detailed measurements of how much light the star gives off at different wave lengths.

Spectra show prominent lines that correspond to elements and compounds. Astronomers can tell what a star is made of by reading these spectral lines.

Hayden and his colleagues used APOGEE data to map the relative amounts of 15 separate elements, including carbon, silicon, and iron for stars all over the galaxy.

What they found surprised them -- up to 30 percent of stars had compositions indicating that they were formed in parts of the galaxy far from their current positions.

This discovery was published in The Astrophysical Journal.

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