First RAVE data release offers clues to Milky Way evolution

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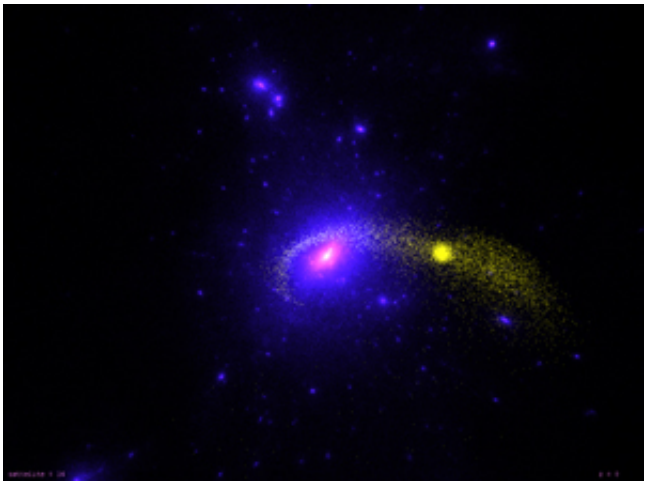

Simulation of a stream of stars from a small galaxy orbiting a larger one. Image: Brad Gibson, Centre for Astrophysics and Supercomputing, Swinburne University

An international team of astronomers released to the public the first data collected as part of the Radial Velocity Experiment, an ambitious spectroscopic survey aimed at measuring the speed, temperature, surface gravity and composition of up to a million stars passing near the sun.

The measurements, released at an astrophysics workshop at the Aspen Center for Physics in Colorado and available today online to other astronomers, includes examination of old "fossil" stars that were born when our Milky Way galaxy was in its infancy. Team members posit that

such data may eventually provide evidence to back up theories that our galaxy has -- over time -- "cannibalized" other, smaller galaxies and is "digesting" them.

"Our research focuses on the oldest stars, and probes the earliest phases of the evolution of our home galaxy, the Milky Way," said Rosemary Wyse, a professor in the Henry A. Rowland Department of Physics and Astronomy in Johns Hopkins' Krieger School of Arts and Sciences and a member of the RAVE team. "The unprecedented sample available with RAVE will allow me -- and now, with the release of this data, others -- to test ideas of our origins laid out by various cosmological theories."

The team also includes members from the United States, Germany, Australia, Canada, the Netherlands, the United Kingdom, Slovenia, Italy, Switzerland and France.

The survey has been made possible by the unique capabilities of the "six-degree field" multi-object spectrograph on the 1.2-meter UK Schmidt Telescope of the Anglo-Australian Observatory, located at Siding Spring Observatory in New South Wales, Australia. This instrument is capable of obtaining spectroscopic information for as many as 150 stars at once, from an area of the sky equal to more than 150 times the area covered by the full moon.

"The data we are making public today is twice the sample size of any previous survey, and has extremely high quality," Wyse said. "Other astronomers can definitely use these data in their work. All they have to do is go to our Web site and download it."

The RAVE survey measures the velocities of stars along the line of sight, something that has previously been difficult to obtain for such large samples of stars. Data from RAVE's first year of operation consists of information from some 25,000 stars, including measurement of their

brightness, color and motion across the sky.

"This data set will provide a unique resource for all astronomers working in the field of galactic evolution and, with our public data release, the astronomical community can participate in our endeavor," says Tomaz Zwitter of the Ljubljana University in Slovenia and project scientist of the RAVE survey. "This first sample by itself is already two times the size of the previous largest survey of stars near the sun."

Matthias Steinmetz, director of the Astrophysical Institute Potsdam, and leader of the RAVE collaboration, predicted that "the full RAVE survey will provide a vast resource of stellar motions and chemical abundances, allowing us to answer fundamental questions of the formation and evolution of our galaxy."

Source: Johns Hopkins University