AIP – Astrophysikalisches Institut Potsdam

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First Data Release from the Radial Velocity Survey (RAVE): Clues to the Dynamical and Chemical Evolution of the Milky Way Galaxy

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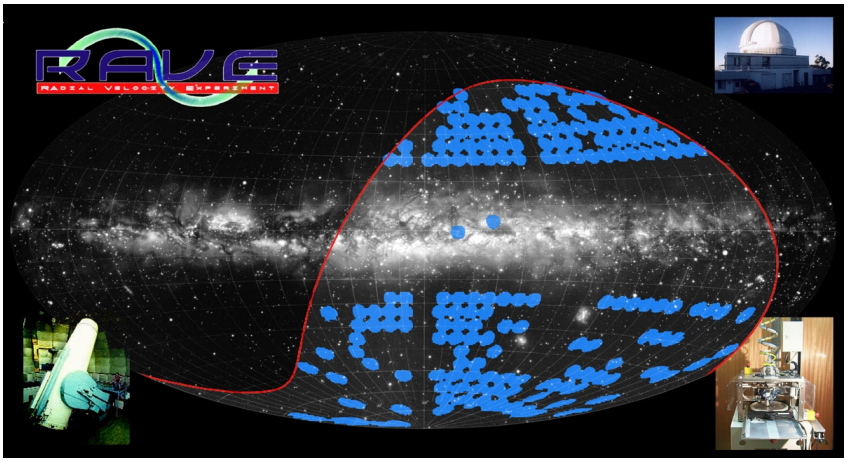

Image 1: **RAVE**-ing in the Southern Sky
©Richard Sword, George Seabroke (Cambridge), **RAVE** Collaboration
The red line divides the northern and southern equatorial hemispheres at declination = 0 degrees. The blue fields of view are part of the first data release from **RAVE** announced today. The blue circles represent the six degree field (6dF) of view of the UK Schmidt Telescope, Anglo-Australian Observatory, Australia. Spectra and radial velocities have been obtained for a sample of stars within these fields of view between 9 < I < 12. **RAVE** aims to observe a random sample of stars covering the entire Southern Sky (below the red line) and to be complete in the cardinal Galactic directions.

Fossil remains from the infant Universe are in our own Galactic backyard, in the form of Milky Way stars that were born a long time ago, possibly even in a different galaxy. Excavating that record will reveal the history of our Galaxy, including possible evidence for the cannibalism that is predicted by current theories of how galaxies come to be. Large samples of stars are need for this endeavour, and are now becoming available.

The first such large sample is being made public today, and will be announced by an international team of astronomers at an astrophysics workshop at the Aspen Center for Physics, Colorado. This data is the first to be released from the **R**adial **V**elocity **E**xperiment (**RAVE**), an ambitious spectroscopic survey that aims to measure the radial velocities and stellar atmosphere parameters (temperature, metallicity, surface gravity) of up to one million stars near the Sun.

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The survey has been made possible by the unique capabilities of the 'six degree field' (6dF) multi-object spectrograph on the 1.2-m UK Schmidt Telescope of the Anglo-Australian Observatory (AAO), sited 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, over a full six degree diameter, an area corresponding to more than 150 times the area covered by the full Moon - and a hundred times larger than most spectrographs can handle.

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. The first data release - data from just the first year of operation - consists of the new line-of-sight motions for some 25,000 stars, and data on 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 Professor Tomaz Zwitter of the Ljubljana University in Slovenia and project scientist of the **RAVE** survey. "This first sample by itself more than doubles the size of the previous largest survey of stars near the Sun".

"**RAVE** will run for several more years, and 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", says Professor Matthias Steinmetz, Director of the Astrophysical Institute Potsdam, and leader of the **RAVE** collaboration.

RAVE is a multi-national project involving scientists from Australia, Canada, France, Germany, Italy, the Netherlands, Slovenia, Switzerland, the United Kingdom and the USA. Funding for **RAVE**, allowing dedicated access to the telescope and instrument, is provided by the participating institutions and by the national research councils of the team members' countries.

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