

Scientists reveal Milky Way's magnetic attraction

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New research shows the Milky Way's magnetic field is far stronger than previously realised. Photo courtesy Stockvault

(PhysOrg.com) -- An international research project involving the University of Adelaide has revealed that the magnetic field in the centre of the Milky Way is at least 10 times stronger than the rest of the Galaxy.

The evidence is significant because it gives astronomers a lower limit on the [magnetic field](#), an important factor in calculating a whole range of astronomical data.

Researchers from the Max-Planck-Institute for Nuclear Physics, the University of Adelaide, Monash University and the United States have published their findings in *Nature* this week.

Dr Roland Crocker, the lead author, and Dr David Jones both worked on the project while based at Monash University and the University of Adelaide's School of Chemistry and Physics. The two physicists are now based at the Max-Planck-Institute for [Nuclear Physics](#) in Heidelberg, Germany.

“This research will challenge current thinking among astronomers,” Dr Crocker says. “For the last 30 years there has been considerable uncertainty of the exact value of the magnetic field in the centre of the Milky Way. The strength of this field enters into most calculations in astronomy, since almost all of space is magnetised,” he says.

Dr Jones says the findings will affect diverse fields, from star formation theory to cosmology.

“If our Galactic centre's magnetic field is stronger than we thought, this raises additional questions of how it got so strong when fields in the [early universe](#) are, in contrast, quite weak. We know now that more than 10% of the Galaxy's magnetic energy is concentrated in less than 0.1% of its volume, right at its centre,” he says.

Dr Jones completed his PhD at Adelaide, studying the Galactic Centre magnetic field under the supervision of Dr Raymond Protheroe, Associate Professor of Physics at the University of Adelaide, and Dr Crocker, a former postdoctoral researcher at the University.

“The [Milky Way](#) just glows in [radio waves](#) and in gamma-rays produced by collisions of [energetic particles](#), and is brightest near its centre. Knowing the magnetic field there helps us understand the source of the radio and gamma-rays better,” says Dr Protheroe.

More information: A 50 uG baseline for the Galactic Centre magnetic field; Roland M. Crocker, David Jones, Fulvio Melia, Jurgen Ott,

Raymond J. Protheroe, *Nature*.

Provided by University of Adelaide

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