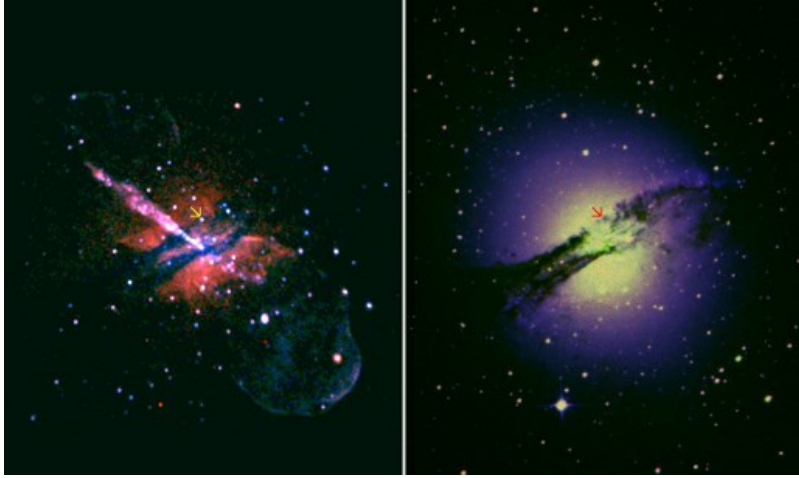


"Ordinary" black hole discovered 12 million light years away

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Scientists from the University of Birmingham have led an international team of astronomers to discover evidence for the existence of an ordinary black hole in the Centaurus A galaxy, which is over 12 million light years away. According to the research, which is published in the April issue of the *Astrophysical Journal*, this is the first time that a "garden variety" black hole has been detected outside the immediate neighbourhood of our galaxy.



X-ray image on left and the optical DSS image on right shows the position of the black hole inside Centaurus A.

Credit: NASA / Chandra

According to theory, black holes should exist everywhere in the Universe. There's a supermassive one at the heart of each large galaxy, weighing at least a million times that of the Sun, and millions of ordinary ones, only a few times the mass of the Sun, sprinkled throughout each galaxy.

Black holes are notoriously difficult to detect, since they don't emit any light. They are found generally as a consequence of the effect of their intense gravity on their surroundings, such as devouring nearby stars. Outside of our galaxy and its handful of neighbours, the only black holes discovered to date that are not supermassive in nature constitute a unique physical phenomena unto

themselves, far brighter than theory predicts. The "garden variety" black holes, as massive as ordinary stars, are fainter than this, and require excellent data to detect outside of our local neighbourhood of galaxies.

The work is part of a collaboration involving academics from universities in the USA, Canada, South America and Europe, who used NASA's Chandra X-ray observatory, which is in orbit around the earth, to carry out some of the longest observations ever performed of a single galaxy. Using these observations, a team belonging to the University of Birmingham's Astrophysics and Space Research group, a part of the School of Physics and Astronomy, detected a point-like X-ray source 50,000 times the brightness of our sun. Over the two-month span of the observations, the source faded by a factor of 100 in brightness, disappearing beneath our ability to detect.

Lead author, Mark Burke, PhD student at the University of Birmingham said; "Celestial sources don't vary so dramatically over such short periods of time. We were able to show by measuring the temperature and power of the source, and the way it varied, that this could only happen if a black hole is the cause of this phenomenon."

Dr Somak Raychaudhury ([/staff/profiles/physics/raychaudhury-somak.aspx](http://staff/profiles/physics/raychaudhury-somak.aspx)), Reader in Astrophysics at the University of Birmingham, who supervised this project, added: "This is a discovery similar to finding planets around other stars- everybody knew they exist, but finding them outside our solar system was very exciting, since it proved that other stars are like our Sun. Finding an ordinary black hole in other galaxies shows that our own galaxy, the Milky Way, isn't peculiar, and it paves the way for us to start looking for potential black holes elsewhere, starting with hundreds of bright X-ray sources that we have observed in the Centaurus A galaxy."

The research, "A Transient Sub-Eddington Black Hole X-ray Binary Candidate in the Dust Lanes of Centaurus A", M. Burke et al, is published in the April issue of *Astrophysical Journal*, and can be found at <http://arxiv.org/abs/1202.3149>.

ENDS

Images available on request

For further information contact Jo Kite, University of Birmingham Press Office on 0121 414 6681 or j.r.kite@bham.ac.uk

Notes to Editor

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