SCIENTIFIC MISCONDUCT

Psychologist Made Up Sex Bias Results

The career of a promising young social psychologist lies in ruins following her admission that she "fabricated" five experiments on social discrimination that she conducted while at Harvard University.

Last week the Office of Research Integrity (ORI) of the Department of Health and Human Services announced that Karen Ruggiero, 33, who last year moved to the University of Texas (UT), Austin, "engaged in scientific misconduct by fabricating data in research supported by the National Institutes of Health." A September report from Harvard assistant dean Kathleen Buckley to Harvard's Standing Committee on Professional Conduct cites Ruggiero's comments in a 21 August letter that the manuscripts were based on "fabricated" data. In addition to retracting four published studies, Ruggiero is banned from receiving federal research funds or serving on government advisory committees for 5 years. A woman who answered the phone at her Texas home declined to discuss the case.

Ruggiero was an "up-and-coming social psychologist," according to social psychologist James Sidanius of the University of California, Los Angeles. She was prominent in a field called "the psychology of legitimacy," in which scientists examine how and why the underdogs in social hierarchies adapt to, and even endorse, the systems of which they are a part. Her support included $38,707 from the National Institute of Mental Health.

A Canadian who received her Ph.D. in psychology at McGill University in Montreal, Ruggiero spent 4 years at Harvard before accepting a tenure-track position at UT last year. After her departure, according to documents released by ORI under the Freedom of Information Act, Harvard received allegations that two of her published studies might contain fabricated data. According to an article in the *Austin American-Statesman*, a graduate student notified Harvard after Ruggiero balked at giving him her notes. She resigned from UT in June.

In her 21 August letter, Ruggiero says that she "did not run" 600 subjects whose data were reported in two papers. A 1999 paper concluded that members of high-status groups are more likely than members of low-status groups to blame failures on discrimination. A 2000 article involved women students who took a test of "creativity" that was graded by male graduate students. Those given low grades were more likely to blame themselves rather than to suspect discrimination, unless they had learned that men had received high marks from the same graders. Ruggiero retracted both papers this summer and has agreed to retract two more. In her letters to the journals she takes full responsibility for her actions, and ORI director Chris Pascal says that neither Harvard nor ORI believes that any co-authors were involved in the misconduct.

Harvard psychologist Herbert Kelman says Ruggiero's admission of misconduct "came as a complete shock." He characterizes her as "very well organized, very hard-working. ... In some respects quite a perfectionist." Michael Domjan, chair of the UT psychology department, says there is no evidence that Ruggiero engaged in any improper conduct while at UT. The situation, he says, is "both tragic and unfortunate." Pascal says that ORI has just begun a $1 million grants program to find out more about why some scientists cheat. –CONSTANCE HOLDEN

ASTRONOMY

Dark Dwarf Galaxy Gets Even Darker

Nine galactic midgets roam our Milky Way's neighborhood, dim collections of stars called dwarf spheroidal galaxies. These objects are "the smallest and wimpiest of all galaxies," says astronomer Raja Guhathakurta of the University of California, Santa Cruz. Yet the wimps pack a heavyweight punch: They appear to contain dark matter in quantities that far exceed the combined masses of their stars.

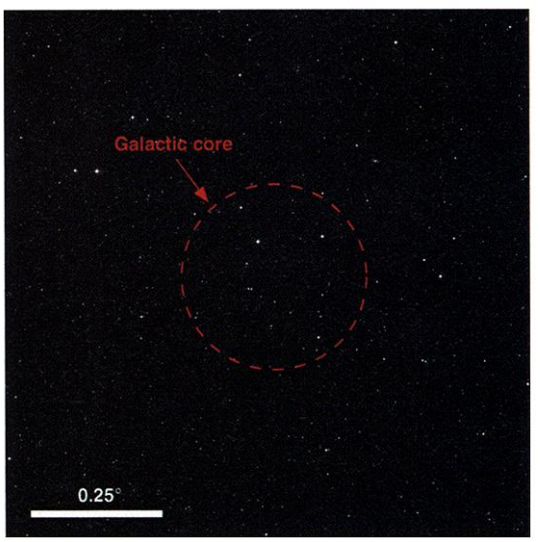
Now, astronomers have their first compelling evidence that the dark matter around a dwarf galaxy sprawls deep into space, creating an extended halo similar to what is thought to shroud all bigger galaxies. Further studies of this cocoon, whose composition remains a mystery, promise to illuminate the early history of our own galaxy, which presumably acquired its heft by eating such dark-matter snacks.

The new data come from the Draco dwarf spheroidal, a smudge of stars about 250,000 light-years away in a dragon-shaped constellation near the Big Dipper. A team led by astronomer Jan Kleyna of Cambridge University, United Kingdom, used the 4.2-meter William Herschel Telescope in the Canary Islands to study 159 giant stars in Draco, many of them in the galaxy's barely detectable outskirts. An instrument with more than 100 individually controlled optical fibers let the team collect light from scores of the faint stars for hours at a time. The instrument yielded spectra of the stars, which revealed their motions through space.

"The achievement of this study is the richness of those observations and the number of [stellar motions measured] at great distances from the galaxy's center," says astronomer James Binney of Oxford University, U.K. Those remote stars are the most critical for tracing the galaxy's mass, Binney notes, because the motion of each one depends on how much matter lies within the entire radius of its orbit.

Stars at Draco's margins dart so quickly that the galaxy probably contains about 200 times more mass than its visible stars suggest, the team found. Moreover, models developed by Kleyna, Cambridge colleagues Mark Wilkinson and Gerard Gilmore, and Wyn Evans of Oxford point to a vast halo of dark matter surrounding Draco, not just a knot among the stars. "The dark matter is not just mixed in with the stars," Kleyna says. "It extends much farther into space." The team reported its results in the 20 December issue of *Astrophysical Journal Letters*.

The dark matter's presence is not a surprise, says Guhathakurta. However, its distribution in a large halo makes Draco look like a tiny precursor to a mature galaxy, not just a puff of stars with some invisible weight sprinkled in. "It's something people believed, but mostly from extrapolation," he says. The calculations fit with the "bottom-up" view of galaxy formation, in which the gravitational fields of big galaxies shred smaller ones and assimilate their stars, gas, and dark matter.



Where's Draco? Star motions point to a shroud of dark matter around this barely visible galaxy.

Draco and its kin are the best labs for reconstructing how that process works, says astronomer Mario Mateo of the University of Michigan, Ann Arbor. "If galaxies really are built from smaller components, these dwarfs are the quanta," he says. "They are the closest places to which we can point and say, 'There is dark matter here.'" But Draco is still hoarding its composition like a dark gem.

–ROBERT IRION

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