

Io's metallic core

Jupiter's moon Io is even more of an oddball than planetary scientists had thought. The only moon known to undergo volcanic eruptions, Io now has another distinction. Observations with the Galileo spacecraft indicate that Io has an iron core that stretches 1,800 kilometers across, or half its diameter.

Researchers have detected a metallic core in only one other solar system body—Earth, which lies far closer to the sun than Io does. "Given their relative locations in the solar system, this remarkable similarity must be accounted for in theories of solar system origin and evolution," write Galileo investigator John D. Anderson of NASA's Jet Propulsion Laboratory in Pasadena, Calif., and his colleagues in the May 3 *SCIENCE*.

Near Io, the craft also detected a large "hole," or less intense region, in Jupiter's magnetic field. The data suggest that something in Io's vicinity, perhaps the moon's own magnetic field, created the hole. If so, Io would be the first moon known to possess a magnetic field.

The craft recorded the data on Dec. 7, 1995, the beginning of its 2-year orbit of Jupiter and its moons. On that day, Galileo came within 899 km of Io, the closest any craft has ever gone to this moon. A decision to limit use of the craft's balky tape recorder prevented Galileo from recording close-up images of Io.

However, radio waves beamed to Earth by the craft allowed researchers to deduce that Io has an iron or iron sulfide core. Slight shifts in the frequency of the detected waves indicated that Io's gravity was causing the craft to deviate slightly from its prescribed path, which wouldn't happen if Io were a uniformly dense body.

Interior heat, resulting either from the initial collapse of material to form Io or from the tidal force continually exerted by Jupiter's gravity, may have generated the core by causing heavier material, such as iron, to sink toward the center and lighter material to float toward the surface to create the mantle of molten rock and crust.

More brown dwarfs

Until a year ago, researchers had had little luck finding the failed stars known as brown dwarfs. These dim, difficult-to-detect bodies form as stars do, but their low mass and weak gravity make them too cool to shine by fusion of lightweight elements into heavier ones. New observations suggest that brown dwarfs may be fairly common in the solar neighborhood. Unlike other brown dwarfs detected last year, which reside in clusters or have an orbiting partner, all of the five most recently found bodies sit alone in the sky.

Last month, at the Royal Astronomical Society's National Astronomy Meeting in Liverpool, England, researchers reported that the starlike object 296A, about 100 light-years from Earth, is a probable brown dwarf. While analyzing light emitted by 296A, a team led by Hugh Jones of Liverpool John Moores University found lithium, an element indicative of a brown dwarf (SN: 6/24/95, p. 389). The team estimates that 296A has 60 times Jupiter's mass, a surface temperature of 2,800 kelvins, and a luminosity one-thousandth that of the sun.

In addition, Jones and Michael R.S. Hawkins of the Royal Observatory of Edinburgh reported that they had detected four much cooler, fainter brown dwarfs. Stacking together more than 100 photographic plates taken by a U.K. Schmidt telescope near Coonabarabran, Australia, the astronomers spied six red bodies too faint to be seen in a single plate. Four of these objects turned out to reside in the solar neighborhood, indicating that they had a luminosity one-hundred-thousandth that of the sun—far too dim to be stars.

Gibor Basri of the University of California, Berkeley says the extreme faintness of the four objects provides compelling evidence of a brown dwarf pedigree.

Testing: Women suffer ills of neglect

Life may be full of missed opportunities, but failure to seize two vital ones—routine testing for chlamydia and cervical cancer—can lead to infertility and, in the latter instance, death.

Widespread testing for chlamydia could spare scores of women the consequences of pelvic inflammatory disease, researchers report in the May 23 *NEW ENGLAND JOURNAL OF MEDICINE*. Universal screening with a Pap test for cervical cancer could prevent most of the 5,000 deaths in the United States each year, a government panel advised on April 3.

Chlamydia is a common sexually transmitted disease, with more than 4 million new cases diagnosed in the United States each year. Many other cases go unrecognized because the disease is often symptomfree. Untreated, it can lead to pelvic inflammatory disease, infertility, and chronic pelvic pain.

A study of 2,607 single, sexually active women at the Group Health Cooperative of Puget Sound, a health plan in the Pacific Northwest, found that women who were not tested for chlamydia were almost twice as likely to develop pelvic inflammatory disease as women who were tested—and, if necessary, treated. "Our study provides evidence that . . . the incidence of pelvic inflammatory disease can be reduced," concluded Delia Scholes of Group Health and her colleagues.

Although screening can virtually eliminate the risk of death from cervical cancer, thousands of women each year die because they can't afford to obtain testing, a consensus panel at the National Institutes of Health in Bethesda, Md., concluded last month. "Cervical cancer is a disease of the economically disadvantaged," asserts chairwoman Patricia S. Braly of Louisiana State University Medical Center in New Orleans.

Half of the 15,000 women newly diagnosed with cervical cancer each year have never had a Pap test; 10 percent more have not been screened in 5 years. The women least likely to be tested—and the women with the highest cervical cancer rates—are uninsured, over 65, Hispanic, older African American, or rural and poor.

Milk isn't just for kids

Provocative, albeit tentative, evidence suggests that regular consumption of milk may reduce a person's risk of stroke, the third leading cause of death in the United States.

These new findings come from a 22-year follow-up of 3,150 Hawaiian men of Japanese descent, all of them 55 to 68 years old when the study began. Over the intervening years, 229 of these volunteers in the Honolulu Heart Program suffered one or more strokes, caused when a blood clot temporarily cuts off adequate supplies of blood to the brain.

Searching for lifestyle factors that might distinguish stroke victims, the analysis focused on dietary habits. "Our main goal was to look at the relationship between calcium and stroke," explains biostatistician Robert D. Abbott of the University of Virginia School of Medicine in Charlottesville. Previous studies had suggested that calcium supplements reduce high blood pressure, a leading risk factor for stroke.

In the May *STROKE*, Abbott and his coworkers report strong evidence that men who eschew milk (7.9 percent) have more than twice the stroke risk of those who drink 1 pint or more daily (3.7 percent). For men who drank less milk, the risks fell between those of the other groups.

Though a good source of calcium, milk provided only about one-third of this mineral in the men's diets. Because intake of the remaining two-thirds exhibited no link to risk, Abbott concludes that milk's benefits trace to factors other than calcium. Indeed, drinking milk may just identify a generally healthful lifestyle. Observes Abbott, "Those who consumed the most milk tended to be the leanest and the most physically active," both factors also linked to lowered stroke risk in this group.