the direction of its poles the compact object emits two jets of radiant material, which ultimately become the radio and X-ray lobes. The light with the moving spectral lines comes from these jets. The material for the jets is continuously drawn from the companion star by the compact object's gravity.

The X-ray observations, which concerned mainly the central X-ray object, found that it throws flares, and that these flares are correlated with the 13-day period. Furthermore the flares are more numerous at particular points of the 164-day cycle. This finding imposes a refinement on the model: The equator of the companion star is at a small angle to the plaen of the binary orbit instead of coinciding with the orbital plane as the simplest dynamical considerations would suggest. The skewing results in an enhanced flow of matter from the companion to the compact object at two points in the 164-day cycle and so an increase in the number of X-ray flares at those times. Further dynamical considerations lead Grindlay et al. to conclude that the compact object is a black hole with about 10 times the sun's mass. —*D.E. Thomsen*

Jupiter's tail at Saturn: The clincher

Was Saturn enveloped in the "tail" of Jupiter's magnetic field while the Voyager 2 spacecraft was flying by in August of 1981? The concept is awesome: that one planet might have actually been enclosed by the electromagnetic domain of another, especially with the two worlds nearly five times as far apart as the earth is from the sun. The case has been frustratingly inconclusive (SN: 4/10/82, p. 247), but now one scientist has reported what he believes to be the clincher.

The first sign that the Jovian magnetotail might be that long came in 1976, when the Pioneer 10 spacecraft, cruising beyond Saturn's orbit, reported that the solar wind seemed to have disappeared for a day. At the time, the probe was on a line with Jupiter and the sun (Saturn was far away around its orbit), and the inference was that it had actually passed through the Jovian tail (which is "blown" straight out from the sun by the solar wind's pressure), whose magnetic field lines had temporarily blocked out the arriving solar-wind particles. This suggested that Jupiter's tail would move across Saturn about every 20 years, when the two planets are lined up with the sun, and it was noted that Voyager 2 might be passing Saturn just about at the time of such an alignment. But did it really happen? Studies have indicated that the outer reaches of extended magnetotails may whip back and forth or split into separate "filaments," so finding the answer has depended on what could be learned from the Voyager data itself.

During the Voyager 2 flyby, scientists were startled when certain frequencies of Saturn's usually continuous radio emission (in a portion called Saturn Kilometric Radiation, or SKR) abruptly disappeared for about four days. SKR is believed to be driven by solar-wind particles pouring into the planet's magnetosphere, so the cutoff could have happened when Jupiter's tail swept by, blocking out the solar wind. On the other hand, it could also have been due to a weakening of the solar wind itself. Later analysis revealed several other SKR dropouts before the flyby, and a few more afterward, but the solar wind is indeed fickle. Confirmation was needed.

The clincher, says Michael D. Desch of the National Aeronautics and Space Administration's Goddard Space Flight Center in Greenbelt, Md., came when he looked at the data from Voyager 1, which had flown past Saturn 10 months before, when the Jovian tail was nowhere near. His finding, reported in the Sept. 1 JOURNAL OF GEOPHYSICAL RESEARCH: No SKR dropouts at all. The ones observed by Voyager 2, he concludes, were "certainly caused by an immersion of Saturn into Jupiter's tail."

Voyager 2 is now on its way to fly past Uranus in January 1986, though it is thought unlikely that *Saturn's* tail extends that far, twice the distance from Jupiter to Saturn. The tail would actually pass by slightly *after* the flyby, notes Desch, but the probe will still be able to monitor Uranus's radio emissions for dropouts.

—*J. Eberhart*

UN and WHO attack needless disability

Of an estimated 1 in 10 persons disabled worldwide, 8 in 10 — or 360 million — inhabit the nonindustrial, developing world. And the real tragedy, says World Health Organization (WHO) Director-General Halfdan Mahler, is that with good medical care, roughly "half of all disabilities in developing countries can be prevented or postponed." That's why WHO is teaming up with two United Nations agencies — UNICEF (the United Nations Children's Fund) and the Development Programme (UNDP) — to launch a global campaign aimed at preventing disabilities.

Named Impact, the campaign will deliver its opening salvos Oct. 2 in New Delhi, India. Among activities scheduled to kick off the program are a series of two-week medical camps. Expected to draw 15,000 to 20,000 patients, each Indian camp will offer free cataract removal, treatment of dangerous ear diseases and orthopedic treatment for the restoration of useful limb function.

Mass medical camps have cut cataract-removal costs to just $10 per person.

Royal Commonwealth Soc. for the Blind

Since Impact's shoestring budget will probably never have sufficient money to fund individual outreach programs, its primary tools of war will be ideas and organizational coordination, explains UNDP's Mary Lynn Hanley in New York. She says the program hopes to drive home what even small, targeted investments can do. For instance, mass treatment costing less than $1 per person annually can control trachoma; affecting 340 million people, it's not only a very widespread infection, but also the leading cause of visual impairment. Simply adding iodine to salt can stem endemic goiter now affecting 200 million people. (Goiter is believed responsible for congenital deafness and retardation in offspring.) **And vitamin concentrates costing pennies per person — or diets with green, leafy vegetables — can prevent vitamin-A deficiency, which blinds 250,000 children annually.**

Targeted at local health care providers, government health planners and independent relief agencies, Impact expects not only to disseminate information on what can be achieved at low cost, but also to demonstrate techniques and devices designed specifically for the developing world. Hanley cites the Jaipur (India) artifcial foot, as one example of the latter. This rubber prosthesis was designed to accommodate farmers who labor in muddy fields and who desire a flexible limb to allow such typical Indian postures as squatting or sitting with crossed legs.

Most important, Impact organizers hope to keep independent projects in the field from duplicating efforts or working at cross purposes. It may sound easy, but "disability prevention is no simple 'trick,'" Mahler says. "A long-term international effort is needed."

Moreover, these disabilities may cost affected societies a 10 percent loss in their productive capabilities, according to UNDP Administrator Bradford Morse. Costs to serve the disabled may increase a society's welfare burden by another 10 percent, he says. "All told, the result is a 20 percent deficit to society at a time when developing and developed countries alike are fortunate if they register social and economic growth rates of even one or two percent a year," Morse says.

—*J. Raloff*