

that ranges from gamma rays through light to long-wave radio. It comes from completely different physical processes and would tell very different things about the physics of those objects.

Study of gravitational radiation would also confirm some basic laws of physics. First the existence of the waves themselves. Second the speed of the waves. It is supposed to be the same as the speed of light, but is it? Then some properties of gravitons could be checked. Like all forms of radiation, gravitational radiation should have a particulate aspect. These particles are known as gravitons. The detection of gravitons as particles is far beyond the dreams of physicists right now, but study of the wave aspect could reveal some characteristics of the particles.

If gravitational waves do not come at the speed of light, that means gravitons have a mass, and the difference will give a measure of that mass. Study of the polarization of the waves can yield the spin of the graviton. It's supposed to be two, and a great deal of the formalism of Einstein's theory and every attempt to build on it depends on that number. Is it two?

Finally, astronomy has always been the science of serendipity par excellence, and in an area as strange as gravitational waves, serendipity could be working overtime. Thorne concludes, "I would say [we could find] something theorists haven't dreamed of." □

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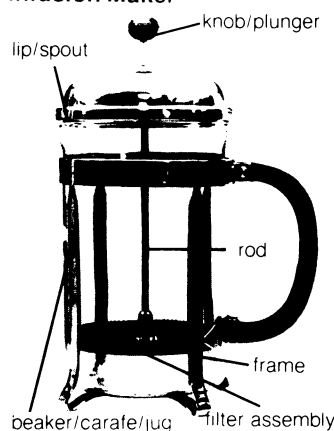
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Newton at the Bat: The Science in Sports — Eric W. Schrier and William F. Allman, Eds. Thirty-five essays about science and sports selected from *SCIENCE 84* magazine, intended for those who may have wondered if a curve ball really drops just before it gets to the batter, why the golf ball has dimples and why the boomerang keeps coming back. Explores such topics as aerodynamics, physics and biomechanics and their application to various sports. The body in relationship to sports is discussed — the architecture of the knee, growing pains of young athletes and what makes muscles work. Scribner, 1984, 178 p., illus., \$14.95.

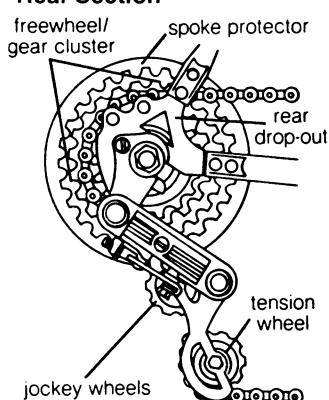
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Total Eclipses of the Sun — J. B. Zirker. Explores for the amateur and professional astronomer the physical reasons for the occurrence of solar eclipses, their durations and paths of totality. Explains how eclipses have been used in scientific investigations and describes recent experiments. Van Nos Reinhold, 1984, 210 p., illus., \$22.50.

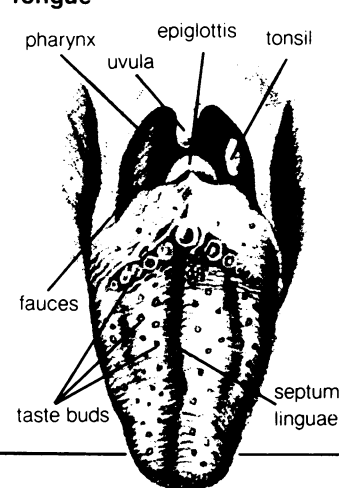
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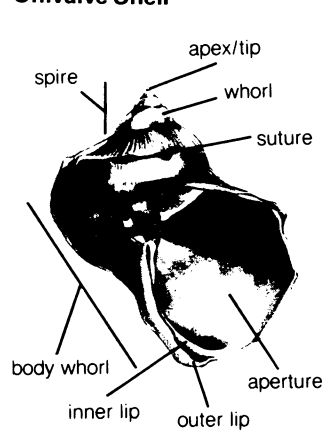
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