October 1974
Les Corps Obscurs de Laplace-Existents-Il?

PARIS, 1976 - At a recent meeting of L'Academie des Sciences, M. Le Marquis de Laplace, the eminent mathematician and natural philosopher, provided for all those present a most amusing and entertaining evening. With readings from his recent best seller "Exposition Du Systeme Du Monde," while circulating amongst the audience.

Book Review:
"The Other Side"
by Alfred Kubin
VIENNA, 1909 - In a fit of brilliant insight and intense productivity, the great Austrian pre-surrealist painter Alfred Kubin has succeeded, where no man has before him, in grasping the full philosophical significance of the collapse into a black hole. A brief illustration from his novel "The Andere Seite" should suffice to support this claim. Turning from the brush to the pen, he wrote: "And now, for the first time, I discovered in the veil of mist an immense, high wall. Suddenly, unexpectedly, I passed it before me. Someone carrying a light was walking in front of us towards an enormous black hole; that was the gate to the Grecian Kingdom. As we approached, I noticed its huge dimensions. We entered a tunnel, keeping as close to it as we could to our guide. Then something stranger happened. I had already penetrated some distance into the tunnel when we turned the corner; I turned around to see how my breath stopped, and my heart beat wildly. Helplessly I looked around me. There was now a wall - a white, feathery wall. From behind it, I heard a whisper: 'I shall never come out of here again.'" This recognition of the role of tidal forces, and of the irreversibility of such a phenomenon are all the more remarkable for they predate Herr Einstein's General Theory of Relativity by seven years.

reprints of his latest paper in the Allgemeine Geographische Ephemeriden, he presented a talk entitled "Future Progress of Des corps obscurs," dark bodies, in number equal to the visible stars. He bases these ideas on his calculations which show that a "gigantic universe, of the same density as the earth, and whose diameter should be 250 times larger than that would be, in consequence of its attraction, allow any of its rays to arrive at the earth." He concluded by saying that "it is therefore possible that the largest luminous bodies in the universe may, through this cause, become invisible." Despite the irreversibility of his mathematics, he failed to suggest how any object would come to exist in such an ignominious state. One can only hope that his work will not be darkened by such flights of fancy. E.g. note the positive text of the eighth edition of "The System of the World" Laplace had expunged all references to "des corps obscurs."

SCIENTISTS FORESEE:
COLLAPSE INEVITABLE

BERKELEY, 1979 - Out of the deeps of the Great Depression, and confronted with the possibility of another worldwide catastrophe, the brilliant young American physicist J. Robert Oppenheimer and his graduate student, former truck driver Harold Snyder, have reported the results of their research on the Physical Review that "when all thermoneutral sources of energy are exhausted, a sufficiently heavy star will collapse." Such news should be kept in mind by those who would hope that a détente could be achieved by bringing pressure to bear on arbitrarily large bodies to counteract the present gravity of the situation. Furthermore, as the authors are the first to point out, while a sufficiently distant observer will never see its final demise, a person collapsing with a massive body will experience all the accompanying stresses in less than a day.

Exciting Young Star Finds Happiness

BOSTON, 1973 - On a day with very little news reaching us, a hopeful and touching story has emerged. It is commonly believed that overweights stars have no alternative but to eventually collapse and disappear from sight altogether. But, so say two MIT Professors, J. Brecher and P. Morrison, in a startling new development in astronomical theory. "The collapse of the massive suns," they suggest in the case of Cygnus (The Swan) X-1, could be due to the interaction of a high mass star and a small black hole. As a result, the black hole would grow in mass and could eventually overcome the star's mass and become a black hole in its own right. If this is true, it could have implications for the study of black holes and the universe as a whole.

Popular model of Cyg X-1, consisting of a binary star system containing a black hole (at the center of the disk, lower left) accreting matter ejected from its more massive companion.

CYGNUS X-1: BLACK HOLE OR RED HERRING?

NEW YORK, April 1, 1971 - The New York Times today reported for the first time the discovery of a "black hole in space." Variously referred to as a "collapsar" (A.G.W. Cameron of the (Ventana) Center for Astrophysical Research), or a "protostellar black hole" (V.D. Zel'dovich of the Soviet Academy of Sciences), such objects have long filled the void of theoretical astrophysics with wonder. Now at last, it seems, there is an object upon which they can lay their speculations. Scientists from American Science and Engineering, Inc., headed by Dr. Ricardo Giacconi, making observations with an instrument named "HERBUS" (Highly Efficient, Rapidly Useful Spectrographic Unit) have finally shed some light on the matter by means of a battery of measurements (see picture). Waving aside the objections of a dissident minor group of scientific opinion that Cyg X-1 is only a "red herring" (i.e., a distractor), the scientists claim they have found an object that could be a black hole. This object is described as a "very dense, very hot, and very massive" (see picture).

With Old Degenerate Dwarf

First detailed color photograph of a black hole. Note features such as upper left and lower center, in good agreement with current theoretical predictions.

Princebln Professor Proclaims Black Holes Have No Hair

PRINCETON, 1972 - Princeton University Professor of Physics, John Wheeler, while refuting an earlier report by his colleague, Robert Oppenheimer, has proclaimed that black holes have no "hair." In his view, black holes are simple objects, with properties that are independent of their spin, electric charge, or mass. This result, he says, is in agreement with theoretical predictions and has important implications for our understanding of the universe.

Contributed by Ken Wilson, dedicated to Dr. Harrington.
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<th>SUNDAY</th>
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<td><strong>Planets This Month:</strong></td>
<td>Venus is brilliant, but rises in bright twilight. Look very low E 30 to 15 min before sunrise and you should see it first half of Oct. Binoculars help, and an unobstructed view of horizon is needed.</td>
<td>Full Moon. Look for moon setting in western sky and around sunrise. Look again around sunset to see moon rising in east. Full moon is in opposite part of sky from sun.</td>
<td>After full moon, the moon rises later each evening. It will be low in the western horizon in the beginning of the month, but it will rise higher later in the month.</td>
<td>A full moon followed by a succession of early evening moonrises occurs each year within 15 days of beginning of autumn. Conventional for the farmer gathering crops, it is called the Harvest Moon.</td>
<td>Notice the deep orange color of the moon when it first rises. All objects, whether stars, planets, moon, or sun, appear reddened when close to the horizon.</td>
<td>Notice that the moon has risen farther to the north along the horizon each night. Look for twinkling Aldebaran, the eye of Taurus, 6° to lower right of moon.</td>
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<td><strong>If the moon now rises too late in the evening for you, you can still see it in the morning, for several hours after sunrise.</strong></td>
<td>Each morning after sunrise, note the shape of the moon, and how far away from the sun it appears in degrees or &quot;fists.&quot; NO LOOK at sun.</td>
<td>This morning the moon is about 90° from the sun. 90° is ⅔ of a circle, so this phase of the moon is called Last Quarter. Note moon's shape, with only one week to go before New.</td>
<td>1 hr before sunrise: The bright &quot;star&quot; close to the moon is actually the planet Saturn. Telescopes show moon's craters and Saturn's rings.</td>
<td>After sky darkens, look carefully at Jupiter with binoculars. You might see its 4 brightest satellites.</td>
<td>1 hr before sunrise: Bright star to lower left of moon is Regulus in Leo. This morning and next two mornings are best for earthshine, bluish light on dark part of moon.</td>
<td>1 hr before sunrise: Jupiter and its moons 2 hrs after sunset, as viewed in binoculars.</td>
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<td>Look for Summer Triangle (Vega, Altair, and Deneb) overhead in early evening and high in W later. Use Map #2 2 hrs after sunset, and Map #10 4 hrs after sunset.</td>
<td>Very thin crescent moon, 1 day before New, rises before sun. Best 45 to 20 min before sunup. 20 min before sunup, look for Venus 9° lower left of moon. Binoculars help.</td>
<td>New Moon, passing nearly between Earth and sun, cannot be seen. Its dark side is toward us.</td>
<td>Before moonlight interference next week, look for Milky Way passing overhead, the &quot;spiral&quot; galaxy in Andromeda high in E, and the Pleiades low in E.</td>
<td>Moon, now 20° to upper left of the setting sun, sets more than an hour after sunset. Face SW in early evening and look for Antares 13° upper left of moon.</td>
<td>Reddish twinkle Antares, the heart of Scorpius, is 4° south of moon. Satellite #3 (Ganymede) disappears into Jupiter's shadow by 9:40 pm EDT. Use telescope.</td>
<td>Jupiter and its moons 2 hrs after sunset.</td>
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<td>This afternoon and next 10 days, look for sun and moon in daytime sky before sunset. Note moon's shape and its angular distance from the sun.</td>
<td>Extend the west side of the Great Square of Pegasus southward, past brilliant Jupiter, to Fomalhaut, the mouth of the Southern Fish.</td>
<td>As you face the setting sun the moon is ½ turn to your left. Note the shape of the First Quarter moon is half. Notice that lighted side of moon is right half (the side toward the sun).</td>
<td>Saturn low in ENE 2 ½ hrs after sunset (look left of Orion): Castor Pollux Saturn</td>
<td>Saturn high in S 1 hr before sunrise (look upper left of Orion): Castor Pollux Saturn</td>
<td>1 hr after sunset: Brilliant Jupiter about 9° to lower left of gibbous moon, three-quarters full.</td>
<td>Jupiter about 7° to lower right of gibbous moon. Moon has shifted eastward since last night, and now appears 5/6 full.</td>
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<td>Tonight the moon appears about 9/10 full. Look for the Great Square of Pegasus to the upper left of the moon.</td>
<td>If you look at the moon carefully early this evening, you may be able to tell the lower left edge appears to be missing. The Square of Pegasus is above the 95% full moon tonight.</td>
<td>The moon appears essentially full, though it isn't exactly so until tomorrow night. Watch for moonrise about 1 hr before sunset today.</td>
<td>Today the moon rises only a short time before sunset. From a place with a good view toward ENE and WSW it should be possible to see sun and moon simultaneously.</td>
<td>The moon has passed exact full phase, so tonight it rises shortly after sunset. You can see sun and moon simultaneously in morning today through most of Oct.</td>
<td>In late October, the bright orange star Arcturus is easy to see 1 hr after sunset (low WNW) and 1 hr before sunrise (low ENE). Follow the curve of the Big Dipper's handle to locate this star.</td>
<td>At end of Oct Spica rises in ESE 1 hr before sunrise. Continue arco of Big Dipper's handle past Arcturus to Spica. Beginning around Oct 31 look for Mercury 4° lower left of Spica. See diagrams in Nov. issue.</td>
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