

## letters

of persons such as Eitan. His "state of parasitism" is a direct result of his dismissal from the Moscow Physics Technology Institute in 1967 when he openly spoke in favor of Israel. As a result he was subsequently denied any possibility of work ever since. Eitan and his wife Alexandra have been methodically harassed by the authorities, but they are steadfast in their fight for permission to emigrate to Israel. The matter is now coming to a head. Eitan now faces either prosecution and committal to a labor camp or a slim hope of being released and allowed to emigrate.

Based on informed sources, a major factor in determining what action the Soviet authorities will actually take in such a situation depends on whether or not there is significant reaction and letters from people in the western world. Your action in a case such as this can literally make the difference between life and death.

For detailed information on where to write, please contact me at 32 Taylor Street, Dover, N.J. 07801. Hopefully, if enough of us help, our efforts will mean freedom and a new life for Eitan, Alexandra, and their 14-month old daughter, Miriam. Please don't let them down.

MURRAY WEINSTEIN  
Dover, New Jersey

## Detecting ether drift

Regarding H. C. Dudley's letter in February (page 73) it must be pointed out that Earth is not rigidly oriented with respect to the celestial sphere, whereas the 160-km/sec velocity vector of its average motion is rigidly oriented. It can then be noted that, if at any arbitrary time the velocity vector is normal to the surface (and therefore undetectable), one need only wait six hours for Earth's rotation to re-orient the surface so that the said vector now lies parallel to the surface and becomes easily measured. It is now only necessary to check to see if the experiment was performed at an appropriate time for this to have occurred.

A quick reading of the Michelson and Morley paper<sup>1</sup> shows that, since they were intent upon measuring Earth's motion relative to the Sun, they took data both at 12:00 noon and at 6:00 pm, searching for the ether drift due to the 30 km/sec orbital velocity of Earth. The experiments contained in this paper were done in July of 1887, and a rather simple calculation shows that on 1 July at 12:00 noon the horizontal component of the Earth's motion relative to the 3 K radiation would be on the order of 150 km/sec, while at 6:00 the horizontal component would be negligible.

I find it hard to believe that an experiment intended to measure a drift difference of 30 km/sec would have failed to turn up the 150-km/sec velocity component which was actually there.

I conclude that any experiment, designed along these lines, to measure the ether drift can only result in the same failure experienced by Michelson and Morley. This is not to say flatly that such an ether does not exist, but only to conclude that if it does exist some much more sophisticated technique will need to be devised to measure it, not just an incorporation of more sophisticated equipment within the same experimental technique.

### Reference

1. A. Michelson, E. W. Morley, "On the Relative Motion of the Earth and the Luminiferous Ether," *The American Journal of Science*, November 1887.

DALE C. SCHEETZ  
Florida Atlantic University  
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## Browsing at home

Messrs. Falk, Beiman, Erlbach and Lax can have a browsing library at City College rather than at AIP, as suggested in their letter in March (page 11).

There are at least three established book vendors who will supply on approval recently published books on any subject or subjects. These new books can be shelved in the library or departmental offices for examination. Titles not purchased are returned to the book vendor.

Several Energy and Research Development contractor librarians have used this book-selection method with success for the last five years.

JOHN P. BINNINGTON  
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## Ozone work at Ford

Your article on "Fluorocarbons and the stratosphere" by Gloria B. Lubkin in the October issue (page 34) provides an interesting appraisal of the problem of ozone depletion and what is being done to better assess its impact. In this connection, we would like to point out the intensity of efforts currently underway in the research laboratories of Ford Motor Company, and some of our contributions to date.

Contrary to the impression that one gets through a casual reading of the article, the technique of laser-induced fluorescence<sup>1,2</sup> as applied to the detection of OH was first demonstrated at Ford in 1972, and the detection of OH in the ambient air<sup>3</sup> was first recorded in Ford's Scientific Research Laboratory

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## letters

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in 1973. The diurnal variations<sup>4</sup> of the OH concentration in air were first measured at Ford in 1974. To this date, Ford is still the only organization that has been able to make any measurement of the OH concentration anywhere below 30 km in the atmosphere.<sup>5,6</sup>

With regard to current activities, Ford has a contract with NASA Ames Research Center to study the feasibility of OH measurements at an altitude of 20 km in the atmosphere using the technique of laser-induced fluorescence. The NSF grant on the spectroscopy of OH, H<sub>2</sub>O, and HO<sub>2</sub> referred to in the article is for a graduate student to work at Ford under the joint supervision of myself and J. F. Ward of the University of Michigan.

## References

1. E. L. Baardsen, R. W. Terhune, *Appl. Phys. Lett.* **21**, 209 (1972).
2. C. C. Wang, L. I. Davis, *Appl. Phys. Lett.* **25**, 34 (1974).
3. C. C. Wang, L. I. Davis, *Phys. Rev. Lett.* **32**, 349 (1974).
4. C. C. Wang, L. I. Davis, C. H. Wu, S. Japar, H. Niki, B. Weinstock, *Science* **189**, 797 (1975).
5. C. C. Wang, *J. Opt. Soc. Am.* **64**, 1380 (1974).
6. C. C. Wang, *Bull. Am. Phys. Soc.* **19**, 24 (1974).

CHARLES C. WANG  
Ford Motor Company  
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## More lights in the sky

Over the past two years several letters have appeared in PHYSICS TODAY in which the authors have discussed the possible origins of some randomly occurring lights in the sky (Epstein, March 1974, page 15; Rutledge, September 1974, page 11; Heaton and Epstein, February 1975, page 11). In view of these letters, and especially in view of Epstein's suggestion (February) that antimatter meteorites could conceivably last up to several minutes and describe somewhat complex (Brownian) motion in Earth's atmosphere, I would like to recount a recent observation made by three witnesses, one of whom is a technically competent civilian employee of a military installation near Washington, D.C.

The witnesses reported seeing two bright, apparently self-luminous, circular objects at midday when the sky was cloudless, empty of aircraft, balloons, and so on, and the visibility was about twenty miles according to the weather records of the date and time. The objects were observed to descend "from the blue" one after the other, and re-

main at a fixed angular altitude for a time estimated to be a minute or more. During this time the observers noted faint dark rings about the central bright regions. The second appearing object then executed a left-right, zig-zag motion and then rose rapidly "straight up." Moments later the first appearing object also began a rapid uniform, apparently vertical, ascent. The object shrank visibly in apparent size as it ascended and was lost to sight nearly directly overhead. The brightness of the objects were reported to be constant throughout the sighting. The angular subtense of each object when at its lowest angular elevation of 25° has been estimated to be at least 1 milliradian but no greater than 10 milliradians. Unfortunately, it was not possible to estimate the distance to the objects.

It is difficult to decide what to make of a report such as this. If the objects had been observed to disappear after their descent, one could argue that the observation is roughly consistent with the antimatter meteor hypothesis of Epstein. However, the final ascent of the objects seems to conflict with this suggestion. In any case, the observational data are quite good and provide useful information with which to test any alternative hypothesis. A more complete report is available from the author.

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## Comment on book review

I should like to comment on Wolfgang Rindler's review of my book, *Ideas of the Theory of Relativity* (March, page 48). The reviewer said that the author "thinks, for example, that . . . (6 points) . . ." Of these, two were erroneous as to what I think. (1) In explaining the idea of spatial curvature, I said that from the outside of the surface of a sphere, it has positive curvature (convex) and from the inside it has negative curvature (concave), in order to demonstrate how a curved surface in Euclidean space is not comparable with the curvature of a Riemannian space, which can be positive from all spatial locations. (2) I did not say that the Robertson-Walker metric is the de Sitter metric! I did say that the R-W metric has the form

$$(ct)^2 - R(t)^2 L^2$$

with  $R = r_0 e^{Ht}$ , but I did not specify the functions  $r_0$  and  $L$ , except to say that they are independent of  $t$ . My only point there (and independent of what you call this form of the metric) was that such a space-time singles out a cosmological (absolute) time coordinate—that is, its measure is the same in all reference frames. I then concluded that this form is not in accord with the