

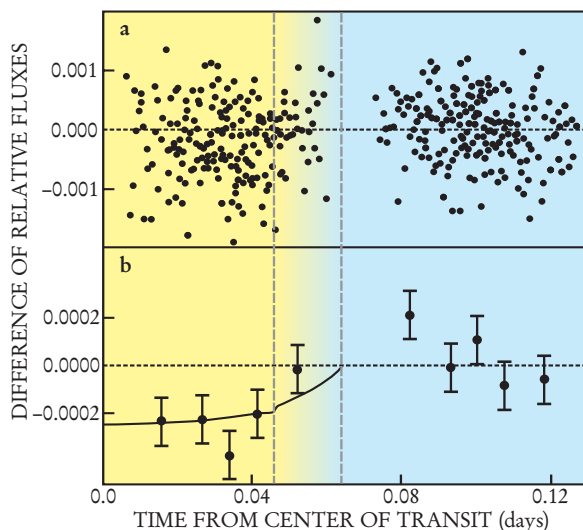


FIGURE 2. SODIUM absorption is seen when the stellar flux averaged over all wavelengths is subtracted from the flux in the sodium window. (a) Difference of relative flux versus time. (b) When binned in time, the data show that sodium absorption is 2×10^{-4} of the total stellar flux when the planet is passing in front of the star (yellow background) and zero when it is not (blue background). (Adapted from ref. 2.)

ically for planets similar to our own.⁸ Kepler will train its sights on 100 000 stars for four years, hoping to see any Earth-sized planets that happen to transit these stars.

Other experiments and missions now being planned will look for such atmospheric constituents as water vapor and methane in the extrasolar planets that have already been spotted. These molecules are expected to show up in the near infrared. Some searches will continue to use ground-based rather than space-based telescopes. With the ground-based instruments, you get a larger observing area, but you then have to weed out the very large background of terrestrial atmospheric absorption.

Looking at the differential absorption during a stellar transit isn't the only way to identify atmospheric constituents, according to Jonathan Lunine of the University of Arizona. One alternative is to use interferometry to look directly at the planet, especially if the planet is far enough from its star. Typically, the planet is obscured by the bright starlight, but an interferometer could be configured to let experimenters cancel out the rays directly from the star and look at the light reflected off the planet's surface or at its thermal emission. Another approach is to directly block the starlight using a coronagraph.

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References

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8. See <http://www.kepler.arc.nasa.gov>.

Correction

We wish to clarify our recent news story about an important sign correction in the standard-model calculation of the muon's anomalous magnetic moment (see PHYSICS TODAY, February 2002, page 18). We were remiss in failing to make clear the central role of Marc Knecht, Andreas Nyffeler, and colleagues at the University of Marseille, in being the first to discover—and make a convincing case—that the long-accepted sign of the hadronic light-by-light scattering contribution to the anomalous moment was wrong. Last November, Knecht and Nyffeler reported a detailed analytic and numerical calculation (ref. 3 in our story) that yielded the correct sign. Furthermore, in an accompanying paper with Michel Perrottet and Eduardo de Rafael (our ref. 4), they clinched the case for the corrected sign with an effective-field-theory approach to the hadronic light-by-light scattering. We also apologize to those who may have taken offense to our reference to the prevalent use of the Pauli metric in the Netherlands as an “ethnic idiosyncrasy [sic].” ■

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