

tially absorbing particle) to rotate. The authors state that no rotation results if the spin and orbital components cancel each other. Note that in the latter case, if one examines the transverse components of the Poynting vector or linear momentum across the doughnut beam profile, one finds that these vectors are still present but point in one annular direction on the inner side and in the opposite annular direction on the outer side of the annular intensity profile. Thus they cancel out in total. I suppose this phenomenon might be thought of as a way to create optical shear and perhaps could even be used as an optical hole cutter, hydraulic stirrer, or bottle-cap remover.

Anthony Siegman
(siegman@stanford.edu)
Stanford University
Stanford, California

Padgett and Allen reply: In our experiment, the particle was Teflon and had an absorption of a few percent, which meant it could be trapped within optical tweezers. In the review, we called it transparent to contrast it with the earlier work of H. He and coworkers.¹ In hindsight, as Anthony Siegman suggests, we should have described it as “slightly, or partially, absorbing.”

Both the spin and orbital angular momentum of a beam can always be calculated from the transverse components of linear momentum. This transverse linear momentum arises both from the azimuthal phase gradient (orbital AM) and a combination of the beam’s intensity gradient and polarization (spin AM). For circularly polarized annular beams, as Siegman correctly describes, the azimuthal linear momentum from the spin contribution has equal and opposite senses on the inner and outer edges of the ring. As a consequence the particle spins, as shown in figure 4 of our article. A detailed consideration can be found in reference 2.

References

1. H. He, M. E. J. Friese, N. R. Heckenberg, H. Rubinsztein-Dunlop, *Phys. Rev. Lett.* **75**, 826 (1995).
2. L. Allen, M. J. Padgett, *Opt. Commun.* **184**, 67 (2000).

Miles Padgett
University of Glasgow
Glasgow, Scotland
Les Allen
Universities of Glasgow
and Strathclyde
Glasgow, Scotland



Albert Einstein to Marie Curie¹

Translated and annotated by Bertram Schwarzschild

Einstein writes in response to vicious attacks on Curie in the French right-wing press. The attacks began in the fall of 1910, when she offered herself as a candidate for the single vacant seat for a physicist in the French Academy of Sciences. The hostile press stressed her foreign birth, her liberal politics, her sex, and her romantic connection with the married physicist Paul Langevin. Curie had been a widow since her husband Pierre was run over and killed in 1906 by a horse-drawn wagon. The Curies had shared the 1903 Nobel Prize in Physics. A month before this letter, it was announced that Marie would receive a second Nobel prize, this time in chemistry.

Prague, 23 November 1911

Esteemed Mrs. Curie,

Don’t laugh at me for writing to you without having anything sensible to say. But I’m so furious at the vile [*niederträchtige*] way in which the rabble [*Pöbel*] at present dares to treat you that I absolutely must give vent to this feeling. I am, however, convinced that you despise this rabble, equally when it’s feigning adoration or when it’s using you to slake its thirst for the sensational! I must tell you how much I’ve come to admire your spirit [*Geist*], your creativity, and your honesty. I consider myself lucky to have made your personal acquaintance in Brussels. Anyone other than those reptiles is certainly happy, now as before, that we have eminent people like you, and also Langevin, among us—real people [*wirkliche Menschen*] with whom one feels privileged to be in contact. If the rabble continues to occupy itself with you, then simply don’t read that swill. Rather leave it to the reptile for whom it’s been fabricated.

With most friendly regards to you, Langevin, and [Jean] Perrin,

Yours very truly,

A. Einstein

P.S. I’ve determined the statistical law of [rotational] motion for a diatomic molecule in Planck’s radiation field by means of a merry joke [*lustigen Witz*], of course on the assumption that the structure’s motion obeys the laws of ordinary mechanics. But I have little hope that this law is valid in reality.²

References

1. *The Collected Papers of Albert Einstein*, vol. 8, R. Schulmann et al., eds., Princeton U. Press (1998) p. 7.
2. For details see Einstein’s letter written the same day to H. A. Lorentz, in *The Collected Papers of Albert Einstein*, vol. 5, English trans., A. Beck, Princeton U. Press (1995), p. 227.

Double Anniversary: Miracles and Peace

In celebration of Albert Einstein’s “miraculous year” of 1905, this year, 2005, is deservedly recognized as the World Year of Physics and also as the International Year of Physics. This year also deserves recognition as the 50th anniversary of the First Geneva Conference on the Peaceful Uses of Atomic Energy—a conference that marked the public debut of global concern about our energy future, the public unveiling of the fusion energy program, and a thaw in Soviet–American relations. Conferences like it, which concern themselves with global energy problems and serve as meet-

ing grounds for political adversaries, are particularly valuable. May they continue to flourish.

Lawrence Cranberg
(info@lawrencecranberg.org)
Austin, Texas

Correction

October 2004, page 22—In addition to the listed advances in electrical control of semiconductor spins, Duke University’s Albert Chang and colleagues have also demonstrated electrically controlled coupling between spins in quantum dots. See C. Chen et al., *Phys. Rev. Lett.* **92**, 176801 (2004) and H. Jeong et al., *Science* **293**, 2221 (2001). ■