

PUBLISHER

Charles Harris

EDITOR/ASSOCIATE PUBLISHER

Kenneth J. McNaughton

ART DIRECTOR

Steven R. Black

CONTRIBUTING EDITORS

Jennifer Ouellette

David Pope

Patrick Young

COPY EDITOR

Jay Cherniak

CIRCULATION

Carol Lucas

ADVISORY COMMITTEE

John Rowell (chair),

Adam C. Daire, Charlotte Lowe-Ma,

Richard H. Lyon, T. Venkatesan,

Thomas R. Steele,

Charles Harris (staff liaison)

ADVERTISING MANAGER

Abby Singer Klar

PRODUCTION MANAGER

Marcia Schlissel-Zelin

EDITORIAL OFFICES

One Physics Ellipse

College Park, MD 20740-3843

Tel: 301-209-3051

Fax: 301-209-0842

e-mail: tip@aip.org

ADVERTISING OFFICES

500 Sunnyside Boulevard

Woodbury, NY 11797-2999

Tel: 516-576-2440

800-247-2242

e-mail: advtsg@aip.org

WORLD WIDE WEB<http://www.aip.org/tip/tip.html>**EXECUTIVE DIRECTOR AND CEO**

Marc H. Brodsky

MEMBER SOCIETIES

The American Physical Society

Optical Society of America

Acoustical Society of America

The Society of Rheology

American Association of Physics Teachers

American Crystallographic Association

American Astronomical Society

American Association of Physicists in Medicine

American Vacuum Society

American Geophysical Union

OTHER MEMBER ORGANIZATIONS

Corporate Associates

Sigma Pi Sigma Physics Honor Society

Society of Physics Students

EDITORIAL

Vision, technology, and motivation

The birth and development of an industry might be likened to operating a car. You need to see where you are going, have the means to get there, and have a driving force to propel you.

Since childhood, I've had the vision of futuristic cars that control themselves and let you put your feet up, read a newspaper, or watch television while zooming down a "smart" highway (unfortunately, some not-so-smart drivers haven't waited for the technology to arrive). As one who drives at least 600 miles each week, I'm disappointed and surprised that automated cars and highways are not already in place.

But vision always predates technology. For smart highways to be even possible, a host of disparate technologies first had to reach critical stages of development: computers, sensors, lasers, navigation systems. Now the technology has arrived—at least on an experimental basis—with a working model planned by 2002 (see "Briefs," p. 16).

Even with all of the technologies in place, someone has had to think about how to draw on all these technologies to make "intelligent" transportation happen. Thinking about things—especially, big complex things—is what physicists do best. David Register at Phillips Petroleum, in his letter about hidden physicists (p. 41), says that physicists, because of their training, have an almost unique capability to synthesize concepts from a number of seemingly disparate pieces of information, and that this approach is based on a fundamental understanding of the possibilities of solutions.

Vision and technology alone, however, are not going to make great things happen unless there is an economic and political imperative to change the status quo. It's not surprising that driver frustration with long lines at toll booths has made automated toll collection one of the first functions of smart highways. Likewise, rising levels of automobile emissions helped make pollution reduction one of the first orders of business for industrial ecologists. Increasing hazards and finite resources are new imperatives that take us beyond some kind of feel-good movement, as Thomas Graedel points out in "Industrial Ecology at the Crossroads" (p. 24).

It's hard to believe that silicon-based, integrated circuits are drifting toward obsolescence, but it's equally hard for even the Semiconductor Industry Association to see how the present rate of bit-packing growth can continue past the next 13 years. We have a vision of what computers need to be able to do, and plenty of motivation to keep this multibillion dollar industry moving forward. If silicon hits the wall in the next 25 years, however, we will need alternative technologies mature enough to take the next step. Nancy Forbes in "Life After Silicon: Ultra-scale Computing" (p. 20) reports on exotic alternatives that are already being explored. At this point, none of these lines of research look like they will become commercially viable any time soon, but if one or two of them do develop, we will have opened another smart highway to a whole new industry.

Charles Harris
Publisher



THE INDUSTRIAL PHYSICIST (ISSN 1082-1848; CODEN INPHFA), volume 3, number 4, is published by the American Institute of Physics, 500 Sunnyside Boulevard, Woodbury, NY 11797. **Subscriptions.** *The Industrial Physicist* is available on a free subscription basis to qualified parties who fill in, sign, and mail the enclosed form. Nonqualified parties may subscribe at the following annual rates: members of affiliated societies, \$18; non-member individuals, \$24; institutions, \$48. Please add \$15 for foreign delivery via surface mail (including Canada and Mexico) and \$30 for international delivery by expedited air freight. Single copies are available for \$20 (postage paid). Contact the editorial office. **Other information.** For change of address and other subscription information contact *The Industrial Physicist*, P.O. Box 96000, Collingswood NJ 08108-9944; tel. 609-488-1881; fax. 609-488-6188. **Copyright © 1997 American Institute of Physics.** Republication or systematic or multiple reproduction of any material in this publication is permitted only under license from AIP. Please send requests for permission to AIP Office of Rights and Permissions, 500 Sunnyside Blvd., Woodbury, NY 11797-2999, fax (516-576-2327), phone (516-576-2268), email (rights@aip.org). Copies of articles may be made upon payment of a copying fee of \$10 per copy through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.