

## PUBLISHER

Randy Nanna

## EDITOR/ASSOCIATE PUBLISHER

Kenneth J. McNaughton

## ART DIRECTOR

Steven R. Black

## CONTRIBUTING EDITORS

Jay C. Cherniak

Nancy Forbes

Eric J. Lerner

Jennifer Ouellette

Patrick Young

## CIRCULATION DIRECTOR

Jeff Bebee

## EDITORIAL ASSISTANTS

Sharon J. Quarles

Marian D. Smith

## ADVISORY COMMITTEE

John Rowell (chair), Peter Brown, Don Christiansen, Adam C. Daire, Richard H. Lyon, Thomas R. Steele, Richard E. Swanson, Mark Talwani, Randy Nanna (staff liaison)

## ADVERTISING MANAGER

Abby Singer Klar

## PRODUCTION MANAGER

Christine DiPasca

## SENIOR PRODUCTION ASSISTANT

Rita C. Wehrenberg

## 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

Two Huntington Quadrangle, Suite 1N01

Melville, NY 11747-4502

Tel: 516-576-2440

800-247-2242

e-mail: advtsg@aip.org

## WORLD WIDE WEB

<http://www.aip.org/tip>

# AMERICAN INSTITUTE OF PHYSICS

## 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

## LETTERS

# Superconducting motor

I read with interest your piece on the superconducting motors being built by American Superconductor and Reliance Electric (*The Industrial Physicist*, October 1999, p. 8). In that program, my firm designed and built the rotor cryostat for the 200-hp version, which is cooled by gaseous helium at about 16 K. Although the high-temperature superconductors are superconducting at 77 K, they cannot achieve the required fields at 77 K. I know that the 1,000-hp version they are now building also uses helium at 16 K. Just thought you'd like to know.

Michael Morgan

Ability Engineering Technology

South Holland, Illinois

[ability@worldnet.att.net](mailto:ability@worldnet.att.net)

## Sound bite

In the article "The incredible shrinking microphone" (*The Industrial Physicist*, August 1999, p. 8), there was a sidebar about CD recordings made with tiny "silicon" microphones. However, there were no CD numbers listed, nor was there a place or address given where someone could access the recordings. Can you provide one?

Jim Mastracco

Washington, D.C.

[We have mounted a sound bite on our Web site ([www.aip.org/tip](http://www.aip.org/tip)) of Luciano Pavarotti singing the aria "Nessun Dorma" from *Turandot*. The recording was made with a tiny silicon microphone built by Lucent Technologies' Bell

Laboratories. On our home page, click Index and What's new—Ed.]

## Selling physics

The pages of physics publications often mention the dire state of physics—as a discipline, as an area of study, or as an employment opportunity. Students don't see physics as a viable discipline to study, companies don't see the benefit of hiring physicists, and, indeed, physics and physicists are nearly invisible to the public eye. One might reasonably conclude that few people understand or appreciate physics, or perhaps even know about it! If this is the case, then we run the risk of the ultimate demise of physics—which is hardly an acceptable outcome.

There is hope, however, because we can draw on the experience of industry, which constantly faces an analogous problem. When a new industry emerges, a new technology develops, or new products are created, they are, by definition, unknown to consumers. Successful businesses not only make the public aware of the product, they make the public need the product. The physics community could follow this example and convince the world that it needs physics and physicists. The term *need* requires clarification, for few of us actually need anything. It is rather the *perceived need* that drives a consumer to purchase a product. Today, the public at large hardly perceives a need for physics and physicists, however important and useful we in the scientific community think physics is.



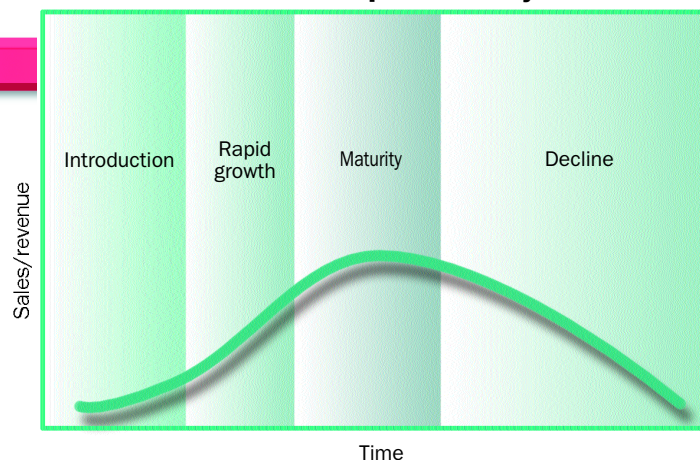
THE INDUSTRIAL PHYSICIST (ISSN 1082-1848; CODEN INPHFA), volume 5, number 6,

Copyright © 1999 American Institute of Physics. **Subscriptions:** *The Industrial Physicist* is

available free to qualified parties in the USA who complete, sign and return the qualification cards in each issue. Mail to *The Industrial Physicist*, P.O. Box 96000, Collingswood, NJ 08108-4319, or fax (856) 488-6188. Subscriptions can also be entered via the Web at [www.cdmcon.com/ipy/subscribe.htm](http://www.cdmcon.com/ipy/subscribe.htm).

**Qualified readers outside the USA** pay \$30/year to defray postage. To subscribe, complete a qualification card and send payment: a check for \$30 U.S. drawn on a U.S. bank, or credit card information (indicating Visa/MC/Amex, credit card #, expiration date, name as it appears on the card, and billing address) to AIP, Attn: TIP Payments, Two Huntington Quadrangle, Suite 1N01, Melville, NY 11747-4502. **Non-qualified subscriptions:** Those not active in the industries served by *The Industrial Physicist* can receive the magazine at the following rates: members of AIP-related societies \$18/year, all other individuals \$24/year, libraries and institutions \$72/year. Non-qualified parties residing outside the USA are also subject to the \$30 surcharge for international postage. To order, send request with name, address and payment information as for qualified readers outside the USA. **Change of address, cancellation, duplicate copies:** Please fax the mailing label(s) from the front cover(s) of your magazine(s) to 856-488-6188, and indicate clearly the necessary changes. **Back copies** are available for \$20 each postage paid from the AIP office listed under "Qualified readers outside the USA," using the same pre-payment instructions. **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, Two Huntington Quadrangle, Suite 1N01, Melville, NY 11747-4502; fax (516-576-2450); phone (516-576-2268); email ([rights@aip.org](mailto:rights@aip.org)). Copies of articles may be made upon payment of a copying fee of \$15 per copy through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

## Phases of the product life cycle



Industry has long embraced product life-cycle theory, which describes a universal series of stages through which every product, industry, and firm passes.

This cycle has four major periods: introduction, rapid growth, maturity, and decline. Physics and physicists can also be considered to be products, consumed by students, the public, and industries. The dependent variable (sales/revenue) can be interpreted according to the topic at hand—major or graduate enrollments, new hires, or funding levels, for example.

In the first stage, a product or service exists that is unknown to the consuming public. The consumer is uneducated about this product—indeed, the consumer does not feel a need for it and may not be aware that a problem exists for which it represents a solution. The remedy to this situation is known as *primary demand marketing*, in which industries market consumers on the whole idea of the product, without concern for the specific brand. The commercials you see for steel, dairy products, and plastics are all examples of primary demand marketing—creating a need for a class of products without any mention of brands.

In the second phase, there is a weeding out of different brands. As the public catches on to the benefits of the product, the advertising settles into *selective demand marketing*, in which each producer tries to convince the public to purchase its brand rather than those of competitors. By the mature phase, the third in the sequence, only a handful of producers are left, each providing virtually identical products but each with perceived differences. For physics, this phase might correspond, for example, to the competition between funding a telescope, a space station, or a supercollider.

Every product shows a decline in demand—the signature of the final phase. Without product extension, in which modifications are made, or introduction of a new product, the product or industry begins to fail and ultimately ceases to exist. If mea-

sured by funding levels, college and graduate enrollments, and to a lesser extent, hiring, physics is clearly in this state.

We must revert to viewing physics as a product in the *introductory* phase—as a product to be reintroduced to the market. From product life-cycle theory, we know that primary demand marketing is a successful approach. The physics community as a whole must sell the world on *physics*—not on any specific project, theory, or application. The physics community must band together and expend the resources and effort necessary to sell physics. Advertisements exhibiting physicists in the workplace, demonstrating the application of physics to everyday life, and showing physicists as interesting, approachable people are necessary to begin this process. The campaign must use the popular media—newspapers and magazines, posters and calendars, radio and TV. If we succeed in selling physics, then the projects and research we so enjoy will be supported. If we fail to sell physics, then our existence will be limited, and, ultimately, extinguished.

Douglas N. Arion  
Professor of Physics  
Carthage College  
Kenosha, Wisconsin  
ariond1@carthage.edu

## HOW TO REACH TIP

<http://www.aip.org/tip>  
[tip@aip.org](mailto:tip@aip.org)

### CONTRIBUTING EDITORS

**Nancy Forbes** ([nforbes@tasc.com](mailto:nforbes@tasc.com))  
**Eric Lerner** ([elerner@igc.apc.org](mailto:elerner@igc.apc.org))  
**Jennifer Ouellette** ([ouellete@aps.org](mailto:ouellete@aps.org))  
**Patrick Young** ([young@nasw.org](mailto:young@nasw.org))