

# Applied Physics Letters

Gilbert J. Perlow, Editor

Samuel D. Bader, Robert E. Holland, Alexander Langsdorf, Jr., F. Paul Mooring,  
Lynn E. Rehn, and Robert K. Smither, Associate Editors  
Diane M. Kurtz, Assistant to the Editor

## Editorial Board

Term ending 31 December 1987

John Clarke  
George D. Cody  
Y. R. Shen  
Takuo Sugano

Term ending 31 December 1988

Rolf Landauer  
C. Kumar N. Patel  
James J. Rhyne

Term ending 31 December 1989

John S. Blakemore  
Karl Hess  
George I. Stegeman

AIP EDITORIAL AND COMPOSITION STAFF: Janis Bennett, *Managing Editor*; Yin Ping Ho, *Chief Copy Editor*; Andrea Zeitter, *Senior Copy Editor*; Patricia Barker, *Copy Editor*; Barbara Maki, *Keyboarding Supervisor*; Honey West, *Paste-up Supervisor*; Dianne Longi, *Production Control Supervisor*; Cindy Klingensmith, *Production Assistant*

*Applied Physics Letters* is published weekly by the American Institute of Physics with the cooperation of the American Physical Society and the Optical Society of America. Its purpose is to provide rapid dissemination of new developments in fields regularly covered by the *Journal of Applied Physics*.

## Information for Contributors

**Submit manuscripts** to Gilbert J. Perlow, Editor, *Applied Physics Letters*, Argonne National Laboratory, P. O. Box 8296, Argonne, IL 60439-8296. Submission is a representation that the manuscript has not been published previously nor currently submitted for publication elsewhere. The manuscript should be accompanied by a statement transferring copyright from the authors (or their employers—whoever holds the copyright) to AIP; a suitable form for copyright transfer is occasionally printed in the back of this journal and is available from the Editor's office or AIP. This written transfer of copyright, which previously was assumed to be implicit in the act of submitting a manuscript, is necessary under the 1978 U.S. copyright law in order for AIP to continue disseminating physics research results as widely as possible. Further information may be obtained from AIP.

**Publication Charge:** To support the cost of wide dissemination of research results through publication of journal pages and production of a data base of articles, the author's institution is requested to pay a *page charge* of \$85 per page (with a one page minimum) and an *article charge* of \$20 per article. The page charge (if honored) entitles the author to 100 free reprints. For Errata the minimum page charge is \$10, with no article charge and no free reprints. Nonpayment of the publication charge may lead to delay in publication.

**Timeliness and current importance of the subject matter, and brevity and clarity of the presentation** determine the acceptability of contributions. Feasibility studies and mere proposals for future research seldom meet the criteria for acceptability. Contributions lacking the element of urgency may be acceptable as Communications in the *Journal of Applied Physics*. Each Letter should be reasonably self-contained, and may on occasion be followed by a comprehensive report in the *Journal of Applied Physics* or elsewhere. Results of an extended research program should not be presented as a series of Letters in place of a comprehensive article.

**Manuscripts** may normally be planned to occupy two journal pages, and must never exceed three journal pages. An abstract limited to about 100 words is required. In addition to the title, abstract, and references, the two-page length permits about 1800 words of text, reduced however by allowances for equations, tables, and figures. An average one-column figure with its caption will displace about 220 words of text. Authors are cautioned that discovery of excess length might not occur until a late stage in publication and would then result in delay

and expense. Circumvention of the length limitation by division of a long article into small parts is considered to be contrary to the purposes of this journal.

A section on Comments is available for criticism or additions to Letters already in print. A Response will normally be solicited to a critical Comment. Comments should contain 1000 words or less.

Instructions for preparation of manuscripts will be found in most issues of this journal. In brief and incomplete summary: Two copies of the manuscript, including clear copies of the figures, are required double spaced throughout on one side of 21.6 × 28 cm (8½ × 11 in.) paper. The abstract, references, figure captions, and tables are similarly to be double spaced, each on its separate sheet. The original figures should be line drawings or high-contrast glossy prints not larger than 21.6 × 28 cm and should be included with the submission. References should conform to the style used in AIP journals, including this one. Unusual mathematical symbols should be clarified with marginal notes.

**AIP's Physics Auxiliary Publication Service (PAPS)** is a low-cost depository for material which is part of and supplementary to a published paper, but is too long to be included in the journal; inquire of the Editor.

**Proof and all correspondence** concerning papers in the process of publication should be addressed to: Managing Editor, *Applied Physics Letters*, American Institute of Physics, 335 East 45 Street, New York, NY 10017-3483. In all correspondence reference should be made to title, author, journal, and scheduled date of issue. A limited number of alterations in proof are unavoidable, but the cost of making extensive alterations after the article has been set in type will be charged to the author.

**Copyright 1987**, American Institute of Physics. Individual teachers, students, researchers, and libraries acting for them are permitted to make copies of articles in this journal for their own use in research or teaching, including multiple copies for classroom or library reserve use, provided such copies are not sold. Copying for sale is subject to payment of copying fees. (See "Copying Fees" paragraph elsewhere in this journal.) Permission is granted to quote from this journal with the customary acknowledgment of the source. To reprint a figure, table, or other excerpt requires in addition the consent of one of the original authors and notification to AIP. Reproduction for advertising or promotional purposes, or republication in any form, is permitted only under license from AIP, which will normally require that the permission of one of the authors also be obtained. Direct inquiries to Office of Rights and Permissions, American Institute of Physics, 335 East 45 Street, New York, NY 10017-3483.

## Information for Contributors

Send manuscripts to the Editor, Gilbert J. Perlow, Applied Physics Letters, Argonne National Laboratory, P.O. Box 8296, Argonne, IL 60439-8296. A covering letter should specify authors, title, Journal, and any special requests.

For general format and style consult recent issues of the journal and the current revised edition of the American Institute of Physics *Style Manual* (which may be obtained for \$7.50 from American Institute of Physics, 335 East 45 Street, New York, NY 10017).

The **Manuscript**, including the abstract, references, and figure captions should be neatly typed in English, double spaced on one side only on 21.6 × 28 cm (8½ × 11 in.) white paper and submitted in duplicate. Clear copies by an electrostatic copier are generally acceptable instead. They should include copies of the figures. All pages are to be numbered in a single sequence beginning with the title and abstract pages. The original figures should be submitted with the manuscript.

**Manuscripts** may normally be planned to occupy two journal pages, and must never exceed three journal pages. An **abstract** limited to about 100 words is required. In addition to the title, abstract, and references, the two-page length permits about 1800 words of text, reduced however by allowances for equations, tables, and figures. An average one-column figure with its caption will displace about 220 words of text. Authors are cautioned that discovery of excess length might not occur until a late stage in publication and would then result in delay and expense. Circumvention of the length limitation by division of a long article into small parts is considered to be contrary to the purposes of this journal.

A section on Comments is available for criticism or additions to Letters already in print. A Response will normally be solicited to a critical Comment. Comments should contain 1000 words or less.

The **Title** should be concise but informative enough to facilitate information retrieval. Acronyms are not allowed in the title. They should be used with considerable moderation elsewhere. The Abstract should be limited to about 100 words and should be self-contained (contain no footnotes). It should be adequate as an index (giving all subjects, major and minor, about which new information is given) and as a summary (giving the conclusions and all results of general interest in the article).

**Author's names** should preferably be written in a standard form for all publications to facilitate indexing and avoid ambiguities.

**Equations** should be neatly typed or written in ink, punctuated and aligned to bring out their structure, and numbered on the right. Mathematical operation signs indicating continuity of the expression should be placed at the left of the second and succeeding lines. Use × rather than a centered dot, except for scalar products of vectors. The solidus (/) should be used instead of built-up fractions in running text, and in display wherever clarity would not be jeopardized. Use "exp" for complicated exponents.

**Notation** must be legible, clear, compact, and consistent with standard usage. All unusual or handwritten symbols whose identity may not be obvious must be identified in the margin the first time they appear, and at all subsequent times when confusion might arise. Superscripts are normally set directly over subscripts; authors should note where readability of the meaning requires a special order. If there is any possibility of confusion, indicate superscripts by a black penciled V underneath the superscript and subscripts by a black penciled Δ over the subscript.

**References and footnotes** are treated alike. They must be numbered consecutively in order of first appearance in the text and should be given in a separate double-spaced list at the end of the text material. Reference should be made to the full list of authors rather than to first author followed by an abbreviation such as *et al.* References within tables should be designated by lower-case Roman letter superscripts and given at the end of the table. For the proper form, see the *AIP Style Manual* and recent issues of this journal. The number of a grant or

contract is meaningless to our readers and should be omitted unless its inclusion is required by the agency that supports the research.

Separate **tables** (numbered in the order of their appearance by Roman numerals) should be used for all but the simplest tabular material; they should have captions that make the tables intelligible without references to the text. The structure should be clear, with simple column headings giving all units. Unaltered computer output and notation are generally unacceptable.

**Figures** should not be larger than and preferably approximately the same size as the typewritten page so that they can be contained in ordinary mailing envelopes. Smaller figures are less likely to be lost if pasted on paper of this size. Figures should be planned for the 8.5 cm (3½ in.) column width of the journal. In some cases where the figures contain a great deal of detail, 1½ or 2 columns may be used, at the copy editor's discretion. The lettering and plotted points on the figures should be large and clear enough so that they will be legible after reduction (their final size should be no less than 2 mm). Figures should be identified on the back, by their number, the name of the first author, and the journal. The numbering should be in the order in which they are referred to in the text. Each figure must have its own caption; list captions on a separate sheet. Graphs should have properly labeled axes with correctly abbreviated units (see *AIP Style Manual*). The form  $R \times 10^{-3} \Omega$ , for example, is ambiguous and undesirable; use either  $R(10^{-3} \Omega)$  or  $10^{-3} R \Omega$ .

Maximum black-white contrast is necessary. We require original India ink drawings or good clear glossy prints. Avoid small open symbols which tend to fill in upon reduction, small dots and decimal points, and lines that are not thick enough to withstand reduction. Avoid photographs of apparatus by providing schematic line diagrams instead, and replace oscillograph photographs by black-ink tracings wherever possible. For complete instructions see the *AIP Style Manual*.

The Editor strongly prefers to correspond directly with the author rather than through the reports division or through executives of the author's laboratory. Manuscripts returned to authors for revision should be returned to the Editor within three months. A manuscript returned later than this will generally be regarded as newly submitted and will receive a new receipt date.

Authors whose manuscripts have been accepted for publication will receive a letter informing them of the issue for which it is tentatively scheduled. All subsequent correspondence about the paper should be addressed to Supervisor, APL, Editorial Department, American Institute of Physics, 335 East 45 Street, New York, NY 10017. Please do not address correspondence about proof, reprints, return of art work, publication charges, etc., to the Editor. To do so simply delays the appropriate action and reply.

General information regarding publication charges, copyrights, and similar material may be found on the Journal Page of each issue.

Use this checklist to avoid the most common mechanical errors in submitted manuscripts.

1. The manuscript must be double spaced *throughout*, typed on one side of the paper only.
2. Number *all* pages in sequence.
3. Type *title* and *abstract* on a separate first page.
4. Type list of *references*, list of *figure captions*, and *tables* on pages separate from each other and from the main text.
5. Type *references* in the style used by AIP journals.
6. Provide marginal notes to clarify symbols and expressions for the compositor.
7. The original figures must be India ink line drawings or high-contrast, glossy prints not larger than 21.6 × 28 cm.
8. Submit (a) two clear copies (typed on one side of the paper only) with clear copies of figures and (b) the original figures.