

Editors: A. V. Balakrishnan (Managing Editor), Los Angeles, CA; J. L. Lions, Rocquencourt; G. I. Marchuk, Novosibirsk; L. S. Pontryagin, Moscow

Associate Editors: A. Bensoussan, Rocquencourt; R. Conti, Firenze; W. Fleming, Providence, RI; G. Golub, Stanford, CA; P. Henrici, Zürich; K. Itô, Kyoto; P. Kall, Zürich; G. Kallianpur, Chapel Hill, NC; D. Kinderlehrer, Minneapolis, MN; S. K. Mitter, Cambridge, MA; Yu. A. Rozanov, Laxenburg; A. Ruberti, Roma; J. Stoer, Würzburg; R. Temam, Orsay; J. Westcott, London; M. Yamaguti, Kyoto; M. Zakai, Haifa

Treating practical problems of optimization without compromising mathematical precision, this journal embraces a wide range of areas. Included are applications of mathematics to:

- physical systems
- chemical and biochemical systems
- environmental systems (air pollution, water quality management, and related fields)
- problems of optimum design
- biomedical systems
- aerospace systems
- public service systems
- socio-economic systems.

Detailed information and/or sample copy available from the publisher

Subscription Information: ISSN 0095-4616 Title No 245 1985, Vol 13 (3 issues): DM 231,-, plus carriage charges (domestic DM 11,82; foreign DM 18,25)



Springer-Verlag Berlin Heidelberg New York Tokyo

Tiergartenstr 17, D-6900 Heidelberg 1 175 Fifth Ave., New York, NY 10010, USA 37-3, Hongo 3-chome, Bunkyo-ku, Tokyo 113, Japan 10.080/5/1

Instructions to Authors

A. General

In upper right corner of title page write by hand "For CMP".

Manuscripts should be submitted in duplicate. They should preferably be written in English; papers in French or German are also accepted.

Manuscripts must be in their **final form**, typed on one side of each sheet only, with double spacing and wide margins. Formulae should be typewritten whenever possible. Mimeographed copies are not acceptable unless clearly legible.

Please include a "Note for the Printer" explaining markings used. See suggestion overleaf.

To speed up publication, authors will receive **only one set of proofs:** provisionally numbered page proofs. Authors are requested to **correct typographical errors only;** they will be charged for corrections involving changes, additions or deletions to the original manuscript.

Equations should be typewritten whenever possible. Even if you use a sophisticated typewriter, some parts of your manuscript will have to be marked to avoid misunderstandings and mistakes. If there is no difference in size, special attention should be given to the placing of subscripts and superscripts so that they are recognizable as such. Please avoid multilevel formulas, subscripts, or superscripts, whenever possible (see overleaf).

Diagrams should be submitted on separate sheets, not included in the text. They should be drawn in Indian ink in clean uniform lines, the whole about twice the size of the finished illustration. Inscriptions should allow for the figure 1, for example, to be about 2 mm high in the final version (i.e. 4 mm for reduction $\times \frac{1}{2}$). The author should mark in the margin of the manuscript where diagrams may be inserted.

Footnotes, other than those which refer to the title heading, should be numbered consequently and placed at the foot of the page to which they refer (not at the end of the article).

Please give on the first page of the manuscript a **running head** (condensed title), which should not exceed 70 letters including spaces.

References to the literature should be listed at the end of the manuscript. The following information should be provided for **journal articles:** names and initials of all authors, name of the journal, volume, first and last page numbers and year of publication. It is suggested that authors give complete titles of articles referred to. References to **books** should include name(s) of author(s), full title, edition, place of publication, publisher and year of publication.

Examples

Haag, R., Swieca, J.A.: When does a quantum field theory describe particles? Commun. Math. Phys. 1, 308-320 (1965)

Glimm, J., Jaffe, A. Quantum physics. A functional integral point of view. Berlin, Heidelberg, New York: Springer 1981

B. Marking

1. Text

The words "Theorem", "Lemma", "Corollary", "Proposition" etc are normally printed in **boldface**, followed by the formulation in italics (to be underlined by the author in the manuscript) The words "Proof", "Remark", "Definition", "Note" etc are printed in *italics* with the formulation in ordinary typeface

Words or sentences to be set in italics should be marked by single underlining

2. Formulas

Letters in formulas are normally printed in italics, figures in ordinary typeface It will help the printer if in doubtful cases the position of indices and exponents is marked thus: $b_{j}^{\uparrow}, a_{j}^{\downarrow}$ Spacing of indices and exponents must be specially indicated $(A_{m,n}^{m,m})$ otherwise they will be set $(A_{mnn}^{m,m})$. Underlining for special alphabets and typefaces should be done according to the following code

single underlining:	small letter
double underlining:	capital letter
brown:	boldface headings, boldface letters in formulas
yellow:	upright
	(abbreviations e g Rc, Im, log, sin, ord, id, lim, sup, etc.)
red:	Greek
blue:	Gothic
green:	Script
violet :	the numeral 1, and zero (to distinguish them from the small letter l and the
	capital letter O)
orange:	Special Roman

The following are frequently confused:

 $\cup,\mathsf{u},\bigcup,U;\quad \circ,o,O,O;\quad \times,x,X,\kappa;\quad \vee,v,v;\quad \theta,\Theta,\phi,\phi,\Phi,\emptyset;\quad \psi,\Psi;\quad \varepsilon,\in;$

 a', a^1 ; the symbol a and the indefinite article a;

also the handwritten Roman letters:

c, C;	e,1;	I, J;	k, K;	o,0;	p, P;	s, S;	u, U;	v, V;	w, W;	x, X;	z, Z;
Please take care to distinguish them in some way											

C. Examples

1. Special alphabets or typefaces

Script	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, 2, R, S, T, U, V, W, X, Y, L
Sanserif	a, b, c, d, e, f, g, h, e, z, k, l, m, n, o, p, q, i, s, l, u, v, w, x, y, x A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
	a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z
Gothic	U, B, C, D, E, F, G, H, I, J, R, L, M, N, O, P, Q, R, S, I, U, B, W, X, Y, J
	a, b, c, d, e, f, g, h, i, j, f, l, ím, n, o, p, q, r, s, f, t, u, v, w, x, ŋ, z
Boldface	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
	a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z
Special Roman	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, 1
Greek	$\Gamma, \Delta, \Theta, \Lambda, \Xi, \Pi, \Sigma, \Phi, \Psi, \Omega$
	$\alpha, \beta, \gamma, \delta, \varepsilon, \zeta, \eta, \theta, \vartheta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, \nu, \varphi, \phi, \chi, \psi, \omega$

2. Notations

preferred form	instead of	preferred form	instead of
$A^*, \tilde{b}, \gamma', \mathbf{v}$	$ar{A}, ar{b}, ar{\gamma}, ec{v}$	$f: A \to B$	$A \xrightarrow{f} B$
lim sup, lim inf	lim, <u>lim</u>		
inj lim, proj lim	$\varinjlim_{x^2+y^2}$	$\cos(1/x)$	$\cos\frac{1}{x}$
$\exp\left(-(x^2+v^2)/a^2\right)$	$e^{-\frac{x^2+y^2}{a^2}}$	$(a+b/x)^{1/2}$	$\frac{1}{b}$
f^{-1}	\int_{f}^{-1}		$\sqrt{a+\frac{b}{x}}$

Authors of this journal can benefit from library and photocopy fees collected by VG WORT if certain conditions are met. If an author lives in the Federal Republic of Germany or in West Berlin, it is recommended that he contact Verwertungsgesellschaft WORT, Abteilung Wissenschaft, Goethestrasse 49, D-8000 München 2, for detailed information

Why do things half-way? ASTRONOMY AND ASTROPHYSICS

A European Journal

Recognized as a "Europhysics Journal" by the European Physical Society

Astronomy and Astrophysics is the most important journal in its field to be published outside North America. Established in 1969, it is the result of the merging of six renowned European journals in astronomy and astrophysics. Astronomy and Astrophysics presents papers on all aspects of astronomy and astrophysics – theoretical, observational, and instrumental – regardless of the techniques employed – optical, radio, particles, space vehicles, numerical analysis, etc. Letters to the editor, research notes and occasional review papers are also included.

Astronomy and Astrophysics is divided into thirteen sections:

- 1. Letters
- 2. Cosmology
- 3. Extragalactic astronomy
- 4 Galactic structure and dynamics
- 5. Stellar clusters and associations
- 6. Formation, structure and evolution of stars
- 7. Stellar atmospheres

8. Diffuse matter in space

(including H II regions and planetary nebulae)

- 9. The Sun
- 10. The solar system
- 11. Celestial mechanics and astrometry
- 12 Physical and chemical processes
- 13. Instruments, data processing, and computational methods

Astronomy and Astrophysics is edited by an international staff of scientists.

Editors-in-Chief: C. Cesarski, Meudon, France and M. Grewing, Tübingen, Germany, Federal Republic Letter-Editor: S. R. Pottasch, Groningen, The Netherlands ... and a Board of Directors

Subscription Information: ISSN 0004-6361 Title No 230

1985, vol. 142-153 (2 issues each): DM 1890,-, plus carriage charges DM 42,37 domestic, DM 87,60 foreign. Please send your order to your bookseller or to the publisher.

Personal subscription rates are available to isolated workers or to those members of institutes who can prove that their institute has already a full-price institutional subscription. The annual personal subscription rate is DM 37,80, plus carriage charges (see Subscription Information). Application forms for individual subscriptions may be obtained

from ESO, Karl-Schwarzschild-Str 2, D-8046 Garching b. München, FRG



Published by Springer-Verlag Berlin Heidelberg New York Tokyo

on behalf of the Board of Directors European Southern Observatory (ESO)

102/5/1

0

Communications in Mathematica **Physics**

Chief Editor A. Jaffe, Cambridge, MA

Editorial Board

H. Araki, Kvoto M. E. Fisher, Ithaca, NY J. Fröhlich, Zürich R. Haag, Hamburg S. Hawking, Cambridge O. Lanford, Bures-sur-Yvette J. L. Lebowitz, New Brunswick, NJ G. Mack, Hamburg J. Mather, Princeton, NJ L. Nirenberg, New York, NY K. Osterwalder, Zürich G. Parisi, Roma B. Simon, Pasadena, CA Ya. G. Sinai, Moscow T. Spencer, New York, NY S.-T. Yau, La Jolla, CA M. F. Atiyah, Oxford F. Hirzebruch, Bonn G. 't Hooft, Utrecht R. Schrieffer, Santa Barbara, CA I. Singer, Cambridge, MA C. N. Yang, Stony Brook, NY

Responsible for Advertisements

Springer-Verlag Printers Printed in Germany

E Lückermann, M. Stresow, Kurfürstendamm 237, D-1000 Berlin Telephone: (0 30) 8 82 10 31, Telex 01-85 411 Berlin Heidelberg New York Tokyo Brühlsche Universitätsdruckerei, Giessen © Springer-Verlag Berlin Heidelberg 1985 Springer-Verlag GmbH & Co KG 1000 Berlin 33

Advisory Board