# THE ANNALS of MATHEMATICAL STATISTICS

FOUNDED AND EDITED BY H. C. CARVER, 1930-1938 EDITED BY S. S. WILKS, 1938-1949

THE OFFICIAL JOURNAL OF THE INSTITUTE OF MATHEMATICAL STATISTICS

Contents
Saddlepoint Approximations in Statistics. H. E. Daniels
RAO 651
A Confidence Interval for Variance Components. J. R. Green
Kuei Tsao
Identification and Estimation of Linear Manifolds in n-Dimensions. T. A.
JEEVES
Asymptotic Behavior of Some Rank Tests for Analysis of Variance. Fred
C. Andrews
Certain Inequalities in Information Theory and the Cramer-Rao Inequality.
S. Kullback
Some Further Results in Simultaneous Confidence Interval Estimation. S.
N. Roy
Epstein
EPSTEIN
On the Convolution of Distributions. Henry Teicher
Notes: Sequential Procedures that Control the Individual Probabilities of
Coming to the Various Decisions. Lional Weiss
On a Characterization of the Gamma Distribution. R. G. LAHA 784
Matching in Paired Comparisons. J. L. Hodges, Jr. and E. L. Lehmann. 787
Note on a Theorem of Lionel Weiss. Lucien LeCam
Extreme Values in Samples from m-Dependent Stationary Stochastic
Processes. G. S. Watson
Processes. G. S. Watson
Sample Moments. M. ZIA UD-DIN
Unimodal Population. J. H. Cadwell
Abstracts of Papers
News and Notices
Report of the Montreal Meeting
Publications Received

Vol. 25, No. 4 — December, 1954

# THE ANNALS OF MATHEMATICAL STATISTICS

EDITOR E L. LEHMANN

DAVID BLACKWELL J. L. HODGES, JR. ASSOCIATE EDITORS
WASSILY HOEFFDING
WILLIAM G. MADOW

ALEXANDER M. MOOD J. WOLFOWITZ

#### WITH THE COOPERATION OF

Z. W. BIRNBAUM R. C. BOSE HERMAN CHERNOFF KAI LAI CHUNG J. F. DALY D. A. DARLING J. L. DOOB T. E. HARRIS
PAUL G. HOEL
J. KIEFER
WILLIAM H. KRUSKAL
SOLOMON KULLBACK
H. B. MANN
G. E. NOETHER

EDWARD PAULSON M. PEISAKOFF H. E. ROBBINS S. N. ROY L. J. SAVAGE HERBERT SOLOMON CHARLES M. STEIN

LIONEL WEISS

MAX A. WOODBURY

Published quarterly by the Institute of Mathematical Statistics in March, June, September and December at Baltimore, Maryland.

### INSTITUTE OF MATHEMATICAL STATISTICS

General Office:

Department of Mathematics, Michigan State College, East Lansing, Michigan

K. J. Arnold, Secretary-Treasurer

This address should be used for all communications concerning membership, subscriptions, changes of address, back numbers, etc., but *not* for editorial correspondence. Changes in mailing address which are to become effective for a given issue should be reported to the Secretary on or before the 15th of the month preceding the month of that issue.

Editorial Office:

Statistical Laboratory, University of California, Berkeley 4, California

E. L. Lehmann, Editor

Manuscripts should be submitted to this address; each manuscript should be typewritten, double-spaced with wide margins, and the original copy should be submitted (preferably with one additional copy). Dittoed and mimeograped papers are acceptable if they are completely legible and printed on paper that will take corrections. Footnotes should be reduced to a minimum and whenever possible replaced by a bibliography at the end of the paper; formulae in footnotes should be avoided. Figures, charts, and diagrams should be professionally drawn on plain white paper or tracing cloth in black India ink twice the size they are to be printed. Authors are requested to keep in mind typographical difficulties of complicated mathematical formulae. Authors will ordinarily receive only galley proofs. Fifty reprints without covers will be furnished free. Additional reprints and covers furnished at cost.

Subscription Price:

\$12 per year in the U. S. and Canada; \$10 elsewhere. Single issues \$3.50. Back numbers are available at \$12 per volume or \$3.50 per issue.

COMPOSED AND PRINTED AT THE WAVERLY PRESS, Inc., BALTIMORE, MARYLAND, U. S. A.

# THE ANNALS OF MATHEMATICAL STATISTICS

EDITOR E L. LEHMANN

ASSOCIATE EDITORS

DAVID BLACKWELL J. L. HODGES, JR. WASSILY HOEFFDING WILLIAM G. MADOW

ALEXANDER M. MOOD J. WOLFOWITZ

#### WITH THE COOPERATION OF

Z. W. BIRNBAUM R. C. BOSE HERMAN CHERNOFF KAI LAI CHUNG J. F. DALY D. A. DARLING J. L. DOOB T. E. HARRIS
PAUL G. HOEL
J. KIEFER
WILLIAM H. KRUSKAL
SOLOMON KULLBACK
H. B. MANN
G. E. NOETHER

EDWARD PAULSON M. PEISAKOFF H. E. ROBBINS S. N. ROY L. J. SAVAGE HERBERT SOLOMON CHARLES M. STEIN

LIONEL WEISS

Max A Woodbury

Published quarterly by the Institute of Mathematical Statistics in March, June, September and December at Baltimore, Maryland.

## INSTITUTE OF MATHEMATICAL STATISTICS

General Office: Department of Mathematics, Michigan State College, East

Lansing, Michigan K. J. Arnold, Secretary-Treasurer

This address should be used for all communications concerning membership, subscriptions, changes of address, back numbers, etc., but *not* for editorial correspondence. Changes in mailing address which are to become effective for a given issue should be reported to the Secretary on or before the 15th of the month preceding the month of that issue.

Editorial Office:

Statistical Laboratory, University of California, Berkeley 4, California

E. L. Lehmann, Editor

Manuscripts should be submitted to this address; each manuscript should be typewritten, double-spaced with wide margins, and the original copy should be submitted (preferably with one additional copy). Dittoed and mimeograped papers are acceptable if they are completely legible and printed on paper that will take corrections. Footnotes should be reduced to a minimum and whenever possible replaced by a bibliography at the end of the paper; formulae in footnotes should be avoided. Figures, charts, and diagrams should be professionally drawn on plain white paper or tracing cloth in black India ink twice the size they are to be printed. Authors are requested to keep in mind typographical difficulties of complicated mathematical formulae. Authors will ordinarily receive only galley proofs. Fifty reprints without covers will be furnished free. Additional reprints and covers furnished at cost.

Subscription Price:

\$12 per year in the U. S. and Canada; \$10 elsewhere. Single issues \$3.50. Back numbers are available at \$12 per volume or \$3.50 per issue.

COMPOSED AND PRINTED AT THE WAVERLY PRESS, Inc., BALTIMORE, MARYLAND, U. S. A.