



# The Fibonacci Quarterly

THE OFFICIAL JOURNAL OF THE FIBONACCI ASSOCIATION

## TABLE OF CONTENTS

When Does $m - n$ Divide $f(m) - f(n)$ ? A Look at Column-Finite Matrices .....	David Callan 290
Sixth International Conference Proceedings .....	299
A Family of 4-By-4 Fibonacci Matrices .....	Piero Filippini 300
New Editor and Submission of Articles .....	308
Coupled Sequences of Generalized Fibonacci Trees and Unequal Costs Coding Problems .....	Julia Abrahams 309
Eighth International Conference Announcement .....	317
A Pascal Rhombus .....	W.F. Klostermeyer, M.E. Mays, L. Soltes, and G. Trapp 318
On a Class of Generalized Polynomials .....	M. N. S. Swamy 329
A Semigroup Associated with the $k$ -bonacci Numbers with Dynamic Interpretation .....	Victor F. Sirvent 335
Professor Lucas Visits the Putnam Examination .....	Leon C. Woodson 341
The Sum of Inverses of Binomial Coefficients Revisited .....	Juan Pla 342
Directed Graphs Defined by Arithmetic (Mod $n$ ) .....	Ezra Brown 346
Derivative Sequences of Jacobsthal and Jacobsthal-Lucas Polynomials .....	A. F. Horadam and P. Filippini 352
The $(2, T)$ Generalized Fibonacci Sequences ...	W. R. Spickerman and R. L. Creech 358
Author and Title Index for Sale .....	360
Rodrigues' Formulas for Jacobsthal-Type Polynomials .....	A. F. Horadam 361
Elementary Problems and Solutions .....	Edited by Stanley Rabinowitz 371
Advanced Problems and Solutions .....	Edited by Raymond E. Whitney 377
Volume Index .....	383

VOLUME 35

NOVEMBER 1997

NUMBER 4

## PURPOSE

The primary function of **THE FIBONACCI QUARTERLY** is to serve as a focal point for widespread interest in the Fibonacci and related numbers, especially with respect to new results, research proposals, challenging problems, and innovative proofs of old ideas.

## EDITORIAL POLICY

**THE FIBONACCI QUARTERLY** seeks articles that are intelligible yet stimulating to its readers, most of whom are university teachers and students. These articles should be lively and well motivated, with new ideas that develop enthusiasm for number sequences or the exploration of number facts. Illustrations and tables should be wisely used to clarify the ideas of the manuscript. Unanswered questions are encouraged, and a complete list of references is absolutely necessary.

## SUBMITTING AN ARTICLE

Articles should be submitted in the format of the current issues of **THE FIBONACCI QUARTERLY**. They should be typewritten or reproduced typewritten copies, that are clearly readable, double spaced with wide margins and on only one side of the paper. The full name and address of the author must appear at the beginning of the paper directly under the title. Illustrations should be carefully drawn in India ink on separate sheets of bond paper or vellum, approximately twice the size they are to appear in print. Since the Fibonacci Association has adopted  $F_1 = F_2 = 1$ ,  $F_{n+i} = F_n + F_{n-1}$ ,  $n \geq 2$  and  $L_1 = 1$ ,  $L_2 = 3$ ,  $L_{n+1} = L_n + L_{n-1}$ ,  $n \geq 2$  as the standard definitions for The Fibonacci and Lucas sequences, these definitions *should not* be a part of future papers. However, the notations *must* be used. One to three *complete* A.M.S. classification numbers *must* be given directly after references or on the bottom of the last page. **Papers not satisfying all of these criteria will be returned.** See the new worldwide web page at:

<http://www.sdstate.edu/~wscs/http/fibhome.html>

Two copies of the manuscript should be submitted to: **GERALD E. BERGUM, EDITOR, THE FIBONACCI QUARTERLY, DEPARTMENT OF COMPUTER SCIENCE, SOUTH DAKOTA STATE UNIVERSITY, BOX 2201, BROOKINGS, SD 57007-1596.**

Authors are encouraged to keep a copy of their manuscripts for their own files as protection against loss. The editor will give immediate acknowledgment of all manuscripts received.

## SUBSCRIPTIONS, ADDRESS CHANGE, AND REPRINT INFORMATION

Address all subscription correspondence, including notification of address change, to: **PATTY SOLSAA, SUBSCRIPTIONS MANAGER, THE FIBONACCI ASSOCIATION, P.O. BOX 320, AURORA, SD 57002-0320.**

Requests for reprint permission should be directed to the editor. However, general permission is granted to members of The Fibonacci Association for noncommercial reproduction of a limited quantity of individual articles (in whole or in part) provided complete reference is made to the source.

Annual domestic Fibonacci Association membership dues, which include a subscription to **THE FIBONACCI QUARTERLY**, are \$37 for Regular Membership, \$42 for Library, \$47 for Sustaining Membership, and \$74 for Institutional Membership; foreign rates, which are based on international mailing rates, are somewhat higher than domestic rates; please write for details. **THE FIBONACCI QUARTERLY** is published each February, May, August and November.

All back issues of **THE FIBONACCI QUARTERLY** are available in microfilm or hard copy format from **UNIVERSITY MICROFILMS INTERNATIONAL, 300 NORTH ZEEB ROAD, DEPT. P.R., ANN ARBOR, MI 48106.** Reprints can also be purchased from **UMI CLEARING HOUSE** at the same address.

©1997 by

The Fibonacci Association

All rights reserved, including rights to this journal issue as a whole and, except where otherwise noted, rights to each individual contribution.

# The Fibonacci Quarterly

*Founded in 1963 by Verner E. Hoggatt, Jr. (1921-1980)  
and Br. Alfred Brousseau (1907-1988)*

THE OFFICIAL JOURNAL OF THE FIBONACCI ASSOCIATION  
DEVOTED TO THE STUDY  
OF INTEGERS WITH SPECIAL PROPERTIES

## EDITOR

GERALD E. BERGUM, South Dakota State University, Brookings, SD 57007-1596  
e-mail: bergum@mg.sdstate.edu

## CO-EDITOR

PROFESSOR CURTIS COOPER, Department of Mathematics and Computer Science, Central  
Missouri State University, Warrensburg, MO 64093-5045 e-mail: ccooper@cmsvmb.cmsu.edu

## EDITORIAL BOARD

DAVID M. BRESSOUD, Macalester College, St. Paul, MN 55105-1899  
JOHN BURKE, Gonzaga University, Spokane, WA 99258-0001  
LEONARD CARLITZ, Emeritus Editor, Duke University, Durham, NC 27708-0251  
BART GODDARD, East Texas State University, Commerce, TX 75429-3011  
HENRY W. GOULD, West Virginia University, Morgantown, WV 26506-0001  
HEIKO HARBORTH, Tech. Univ. Carolo Wilhelmina, Braunschweig, Germany  
A.F. HORADAM, University of New England, Armidale, N.S.W. 2351, Australia  
CLARK KIMBERLING, University of Evansville, Evansville, IN 47722-0001  
STEVE LIGH, Southeastern Louisiana University, Hammond, LA 70402  
RICHARD MOLLIN, University of Calgary, Calgary T2N 1N4, Alberta, Canada  
GARY L. MULLEN, The Pennsylvania State University, University Park, PA 16802-6401  
HAROLD G. NIEDERREITER, Institute for Info. Proc., A-1010, Vienna, Austria  
SAMIH OBAID, San Jose State University, San Jose, CA 95192-0103  
NEVILLE ROBBINS, San Francisco State University, San Francisco, CA 94132-1722  
DONALD W. ROBINSON, Brigham Young University, Provo, UT 84602-6539  
LAWRENCE SOMER, Catholic University of America, Washington, D.C. 20064-0001  
M.N.S. SWAMY, Concordia University, Montreal H3G 1M8, Quebec, Canada  
ROBERT F. TICHY, Technical University, Graz, Austria  
ANNE LUDINGTON YOUNG, Loyola College in Maryland, Baltimore, MD 21210-2699

## BOARD OF DIRECTORS

### THE FIBONACCI ASSOCIATION

CALVIN LONG (President)  
Northern Arizona University, Flagstaff, AZ 86011-5717  
G.L. ALEXANDERSON, *Emeritus*  
Santa Clara University, Santa Clara, CA 95053-0001  
KARL DILCHER  
Dalhousie University, Halifax, Nova Scotia, Canada B3H 3J5  
ANDREW GRANVILLE  
University of Georgia, Athens, GA 30601-3024  
HELEN GRUNDMAN  
Bryn Mawr College, Bryn Mawr, PA 19101-2899  
FRED T. HOWARD  
Wake Forest University, Winston-Salem, NC 27106-5239  
MARJORIE JOHNSON (Secretary-Treasurer)  
665 Fairlane Avenue, Santa Clara, CA 95051  
JEFF LAGARIAS  
AT&T Labs-Research, Florham Park, NJ 07932-0971  
THERESA VAUGHAN  
University of North Carolina, Greensboro, NC 27410-5608  
WILLIAM WEBB  
Washington State University, Pullman, WA 99164-3113