# Stanley Rabinowitz — Curriculum Vitae

## PERSONAL DATA:                                                December, 2005

Stanley Rabinowitz
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Chelmsford, MA 01824

Single, U.S. citizen, in good health

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email:            Stan.Rabinowitz@comast.net
web page:         www.StanleyRabinowitz.com
Erdös number:     3                                    Erdös - Baumgartner - Wagon - Rabinowitz

## EDUCATION:

| | | | |
|---|---|---|---|
| 1964 | graduated high school | Far Rockaway High School | www.FarRockaway.com |
| 1968 | B.S. Mathematics | Polytechnic Institute of Brooklyn | www.poly.edu |
| 1968 | M.S. Mathematics | Polytechnic Institute of Brooklyn | www.poly.edu |
| | | Master's Thesis: <u>Cyclotomic Polynomials</u> | |
| 1986 | Ph.D. Mathematics | Polytechnic University | www.poly.edu |
| | | Ph.D. Thesis: <u>Convex Lattice Polytopes</u> | ~/bibliography/thesis.html |
| | | Thesis Advisor: Erwin Lutwak | elutwak@poly.edu |

## AREAS OF INTEREST:

Number Theory, Convexity, Combinatorics,  Discrete and Computational Geometry, Lattice Points, Combinatorial Geometry, Euclidean Geometry, Problem Solving, Problem Proposing, Symbolic Mathematics Algorithms, Triangle Inequalities, Algorithms for computing Pi, Parallel Algorithms, Using computers to solve mathematics problems, Automated Theorem Proving, Object-Oriented Programming

## HONORS AND AWARDS:

captain, Far Rockaway High School math team
during Sophomore, Junior, and Senior years in high school, I was top scorer on the
        MAA Contest (later known as AHSME, the American High School Mathematics Examination)
made national honor roll on MAA contest in junior and senior years in high school
Dean's list every semester as an undergraduate
graduated cum laude (3.4 cumulative average)
member, Pi Mu Epsilon, Math Honor Society, New York Iota chapter                www.pme-math.org
ranked 25th in U.S. on 1967 Putnam Mathematical Competition        American Mathematical Monthly 75(1968)733
captain, math team for Polytechnic Institute of Brooklyn
received "Passion for Excellence" award at Avid Technology, 2001 and 2003

## PATENTS:   Full text available at www.uspto.gov/patft

<u>Patent Numbers</u>:

| | | |
|---|---|---|
| 1991 | Video/audio transmission system and method. | 5045940 |
| 2002 | Computer system and process for transferring multiple high bandwidth streams of data between multiple storage units and multiple applications in a scalable and reliable manner. | 6374336,  6415373, 6449688, 6760808, 6785768 |

# WORK EXPERIENCE:

| | | | |
|---|---|---|---|
| 1971-1979 | Senior Software Engineer | Digital Equipment Corporation | Maynard, MA |
| 1979-1983 | Principal Software Engineer | Digital Equipment Corporation | Merrimack, NH |
| 1983-1986 | Principal Software Engineer | Digital Equipment Corporation | Nashua, NH |
| 1986-1989 | Member, technical staff | Alliant Computer Corporation | Littleton, MA |
| 1989-1991 | Principal Software Engineer | Avid Technology | Bedford, MA |
| 1991-1991 | Consulting | Tactician Corporation | Andover, MA |
| 1991-1992 | Consulting | Avid Technology | Burlington, MA |
| 1991-1994 | Consulting | Polybus Systems Corp. | Tyngsboro, MA |
| 1992-1999 | Senior Principal Software Engineer | Avid Technology | Burlington, MA |
| 1999-2005 | Consulting Software Engineer | Avid Technology | Tewksbury, MA |
| 1990-present | Sole Proprietor | MathPro Press | Chelmsford, MA |

## PROJECTS WORKED ON:

For Digital (DEC), I worked on operating systems and system software. On PDP-8, I wrote or worked on PS/8, OS/8, OS/78, COS-300, DIBOL compiler, CAPS-8, RTS-8, TECO-8, DECNET/8, MACREL. On VAX/VMS, I wrote or worked on DECset (computerized typesetting), DEC Test Manager, VMS run-time library (screen management, math libraries, display and manipulation of directed graphs). I also wrote a SNOBOL compiler.

For Alliant, I worked on the run-time library for the FX/8 parallel multiprocessor. I worked on scientific libraries, tuned BLAS and LINPACK, tuned parts of FORTRAN and C run-time library, wrote C vector library, did performance analysis, developed parallel algorithms, parallelized industry standard benchmarks such as Livermore Loops and Linpack . Ported X-Windows, TeX and Macsyma to Concentrix. Worked on 4.2 BSD unix libraries and utilities.

For Tactician, I worked on computational geometry software for their computerized mapping software.

For Polybus, I worked on networking and shared storage systems for the book publishing industry.

For Avid, I worked on Media Composer, coding algorithms for real time display of full-motion high-resolution video with synchro-nized audio for the Macintosh. I developed algorithms for matching back 24fps film edge numbers to 30fps video with pulldown. I also worked on networking and shared storage for the streaming video industry. Built a custom filesystem for the Macintosh OS/9 for MediaNet which randomly stripes data across multiple disks.  Helped with porting this to OS X. I wrote a simulator to help design and analyze ISIS, an infinitely scalable intelligent distributed storage system. Designed algorithms for mapping files across multiple servers and handling redistribution of data when new servers are added or removed. Consulted on RAID 6 algorithms. Wrote a graphical user interface for controlling ISIS using Microsoft Foundation Classes running under Windows XP.

For MathPro, I did whatever was required to start and run a small business, from renting office space to hiring consultants. Did advertising and financial record keeping.  Produced 5 books, and along the way, did typing, proofreading, copyediting, classifying, indexing, book design, artwork, and advertising. Wrote software to automate generating author, title, and keyword indexes. Designed and implemented the corporate web site.

# PROFESSIONAL SOCIETIES:

**I am currently a member of:**

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|---|---|---|
| MAA | Mathematical Association of America | www.maa.org |
| CMS | Canadian Mathematical Society | www.cms.math.ca |
| FA | Fibonacci Association | www.mscs.dal.ca/Fibonacci |
| WFNMC | World Federation of National Mathematics Competitions | www.amt.canberra.edu.au/wfnmc.html |
| ADC | Apple Developer Connection | developer.apple.com |
| MSDN | Microsoft Developer Network | msdn.microsoft.com |

**In the past, I have been a member of:**

| | | |
|---|---|---|
| ACM | Association for Computing Machinery | www.acm.org |
| AMS | American Mathematical Society | www.ams.org |
| AustMS | Australian Mathematical Society | www.austms.org.au |
| SIGART | ACM Special Interest Group on Artificial Intelligence | www.acm.org/sigart |
| SIGPLAN | ACM Special Interest Group on Programming Languages | www.acm.org/sigplan |
| SIGSAM | ACM Special Interest Group on Symbolic and Algebraic Manipulation | www.acm.org/sigsam |
| TUG | TeX User's Group | www.tug.org |

# PROFESSIONAL ACTIVITIES:

Problem Column Editor for *The Fibonacci Quarterly*, 1991-1999 — www.engineering.sdstate.edu/~fib

Problem Column Editor for *Mathematics and Informatics Quarterly*, 1994-1995 — olympiads.win.tue.nl/ioi/misc/miq.html

MAA Advisory Panel to the Committee on American Mathematics Competitions — www.unl.edu/amc/whoswho.html
1978-1979, 1985-1994, 2000-2001

MAA Committee on the American High School Mathematics Examination — www.unl.edu/amc/whoswho.html
1979-1985, 1995-1999

MAA Committee on the American Mathemtics Competitions, 1984 — www.unl.edu/amc/whoswho.html

MAA Committee on the American Invitational Mathematics Examination, 1984 — www.unl.edu/amc/whoswho.html

Organized secial session on Triangle Inequalities
at the 94th Summer Meeting of the AMS, Aug 1991 — Orono, ME

Discovered four sequences that made it into the On-Line Journal of
Integer Sequences: A001521, A070911, A089187, A063984 — www.research.att.com/~njas/sequences

Refereed papers for:
*The American Mathematical Monthly* — www.maa.org/pubs/monthly.html
*The Fibonacci Quarterly* — www.engineering.sdstate.edu/~fib
*Forum Geometricorum* — forumgeom.fau.edu
*The Journal of Integer Sequences* — www.cs.uwaterloo.ca/journals/JIS
*Mathematics Magazine* — www.maa.org/pubs/mathmag.html

Contributed problems for the USA Mathematical Talent Search, 1990-1995 — www.usamts.org

Founded MathPro Press, a company that publishes mathematics problem books — www.MathProPress.com

Published 5 books of mathematics problems — www.MathProPress.com/books/publishedBooks.html

Wrote software for the MAA Context Committee for grading the American High School Mathematics Examination

Edited special edition of *Arbelos*, a publication of the MAA Contest Committee

Organized the Intercollegiate Mathematics League of NYC — American Mathematical Monthly 73(1966)1004-1006

Member FORTRAN Standards Committee, 1987-1988

organizer of TECO Special interest group for DECUS (DEC User's Society); edited newsletter "The Moby Munger"

Canada IMO

US IMO

Moderator Math Notes, online discussion forum

ARML judge, Penn State

# CONFERENCES AND PAPERS PRESENTED:

| | | |
|---|---|---|
| Jan 1987 | 93rd Annual Meeting of the AMS | San Antonio, TX |
| | "Some Inequalities for Lattice Polygons" | AMS Abstract 831-52-469,  8(1987)95 |
| Aug 1988 | 91st Summer Meeting of the AMS | Providence, RI |
| | "Lattice Polygons in Space" | AMS Abstract 844-51-95,  9(1988)306 |
| Jan 1989 | 95th Annual Meeting of the AMS | Phoenix, AZ |
| | "Some Bonnesen-style Triangle Inequalities" | AMS Abstract 847-52-205,  10(1989)93 |
| Apr 1989 | 848th Meeting of the AMS | Worcester, MA |
| | "Interior Hull Inequalities for Lattice Polygons" | AMS Abstract 848-52-74,  10(1989)160 |
| Aug 1990 | 93rd Summer Meeting of the AMS | Columbus, OH |
| | "Consequences of the Lattice Pentagon Property" | AMS Abstract 859-52-142,  11(1990)330 |
| Oct 1990 | 860th Meeting of the AMS | Amherst, MA |
| | "Algorithmic Trigonometry" | AMS Abstract 860-12-81,  11(1990)370 |
| Jan 1991 | 97th Annual Meeting of the AMS | San Francisco, CA |
| | "A Spigot Algorithm for Pi" | AMS Abstract 863-11-482,  12(1991)30 |
| Aug 1991 | 94th Summer Meeting of the AMS | Orono, ME |
| | "Algorithmic Manipulation of Fibonacci Identities" | AMS Abstract 867-11-178,  12(1991)348 |
| Jun 1986 | Farewell Address at DEC | Nashua, NH |
| | "Great Hacks I have Known and Loved" | |
| Nov 1988 | Supercomputing '88 | Orlando, FL |
| Jun 1989 | Computers and Mathematics '89 | Cambridge, MA |
| Jul 1989 | ACM-SIGSAM International Symposium on Symbolic and Algebraic Computation | Portland, OR |
| | "Computer Solution of Symmetric Homogeneous Triangle Inequalities" | |
| Jul 1990 | 4th International Conference on Fibonacci Numbers and their Applications | Wake Forest, NC |
| May 1991 | Conference on History, Geometry, and Pedagogy | Orlando, FL |
| | in honor of the 80th birthday of Howard Eves | |
| Mar 1992 | 1992 Meeting of the New England Mathematical Association of Two Year Colleges | Lowell, MA |
| Jul 1994 | 2nd Congress of The World Federation of National Mathematics Competitions | Pravetz, Bulgaria |
| | was part of U.S. Delegation to this Congress | |
| Jul 1994 | 6th International Research Conference on Fibonacci Numbers and their Applications | Pullman, WA |
| | "Algorithmic Manipulation of Fibonacci Identities" | |
| Jun 1998 | 8th International Research Conference on Fibonacci Numbers and their Applications | Rochester, NY |
| | "Simplification of Reciprocal Sums" | |
| | 2 combinatorics conferences | Boca Raton, FL |

# INVITED TALKS:

| | | |
|---|---|---|
| Aug 1991 | 94th Summer Meeting of the AMS, special session on Geometric Inequalities | Orono, ME |
| | "Some Inequalities for Inradii Associated with a Simplex" AMS Abstract 867-51-176,  12(1991)371 | |
| Jul 1990 | 1st Congress of The World Federation of National Mathematics Competitions | Waterloo, Canada |
| | "Indexing Competition Problems" | |
| | USA Math Olympiad Training Session | West Point, NY |
| | "Complex Numbers in Geometry" | |
| Jun 1996 | Rose-Hulman Young Scholars Program | Terra Haute, IN |
| | gave an invited presentation | |
| Mar 1984 | Digital Equipment Corporation Math Club | Nashua, NH |
| | "Geometrical Properties of the Ellipse" | |
| Jun 1985 | Digital Equipment Corporation Math Club | Nashua, NH |
| | "The Butterfly Gallery" | |
| | avid talks on algorithms for theShared Storage Colloquia | Tewksbury, MA |
| | University of Nebraska at Lincoln Mathematics Dept. | Lincoln, NE |
| | "Applications of Computer Algebra Systems to Mathematics" | |

# PUBLICATIONS:

## BOOKS

Index to Mathematical Problems 1980-1984. MathPro Press, 1992.                ISBN 0-9626401-1-5
Problems and Solutions from the Mathematical Visitor. MathPro Press, 1996.    ISBN 0-9626401-5-8
Index to Mathematical Problems 1975-1979 (with Mark Bowron). MathPro Press,1999.    ISBN 0-9626401-2-3

## PAPERS

Conic Sections and Limits, *The Mathematics Student Journal* **12.1**(1964)5-6.
The Sine Product Problem, *The Mathematics Student Journal* **13.3**(1966)5.
The Intercollegiate Mathematics League, *The American Mathematical Monthly* **73**(1966)1004-1006.
A Magic Rook's Tour. *Journal of Recreational Mathematics* **18**(1985-86)203-204.
A Useful Trigonometric Substitution. *Arbelos* **5**(1986)1-6.
The Seven Circles Theorem. *Pi Mu Epsilon Journal* **8**(1987)441-449.
The Factorization of $x^5 \pm x + n$. *Mathematics Magazine* **61**(1988)191-193.
On the Computer Solution of Symmetric Homogeneous Triangle Inequalities; in *Proceedings of the ACM-SIGSAM
       1989 International Symposium on Symbolic and Algebraic Computation*,  1989. pp. 272-286.
Oblique Pythagorean Lattice Triangles. *Pi Mu Epsilon Journal* **9**(1989)26-29.
The Volume of an n-simplex with Many Equal Edges. *Missouri Journal of Mathematical Sciences* **1**(1989)11-17.
A Census of Convex Lattice Polygons with at most one Interior Lattice Point. *Ars Combinatoria* **28**(1989)83-96.
A Theorem about Collinear Lattice Points. *Utilitas Mathematica* **36**(1989)93-95.
Some Metric Inequalities for Lattice Polygons. *The Journal of Combinatorial Mathematics and Combinatorial Computing*
       **5**(1989)119-138.
Some Sums are not Rational Functions of R, r, and s. *Crux Mathematicorum* **16**(1990)1-3.
On the Number of Lattice Points Inside a Convex Lattice n-gon. *Congressus Numerantium* **73**(1990)99-124.
A Model for Memory Interference in Multiprocessors. *Missouri Journal of Mathematical Sciences* **3**(1991)12-19.
Why are the Exponents the Same? *International Journal of Mathematical Education in Science and Technology*
       **22**(1991)687-689.
A Nonlinear Recurrence Yielding Binary Digits (with Peter Gilbert). *Mathematics Magazine* **64**(1991)168-171.
How to Find the Square Root of a Complex Number. *Mathematics and Informatics Quarterly* **3**(1993)54-56.
$O(n^3)$ Bounds for the Area of a Convex Lattice n-gon. *Geombinatorics* **2**(1993)85-88.
The Octagon Anomaly. *Geombinatorics* **3**(1993)13-17.
A Perplexing Finite Continued Fraction. *Missouri Journal of Mathematical Sciences* **6**(1994)2-9.
A Spigot Algorithm for the Digits of Pi (with Stan Wagon). *The American Mathematical Monthly* **102**(1995)195-203.
Algorithmic Manipulation of Fibonacci Identities; in *Applications of Fibonacci Numbers*, Volume 6 (edited by G. E.
       Bergum, et al.), Kluwer Academic Publishers, Dordrecht, The Netherlands: 1996. pp. 389-408.
Algorithmic Manipulation of Third-Order Linear Recurrences. *The Fibonacci Quarterly* **34**(1996)447-464.
A Polynomial Curve of Constant Width. *Missouri Journal of Mathematical Sciences* **9**(1997)23-27.
A Note on the Sum $\sum 1/w_{k2^n}$. *Missouri Journal of Mathematical Sciences*, **10**(1998)141-146.
Algorithmic Manipulation of Second-Order Linear Recurrences. *The Fibonacci Quarterly* **37**(1999)162-177.
Summation of Reciprocals of Products of Fibonacci Numbers.*The Fibonacci Quarterly* **37**(1999)122-127.
Simplification of Reciprocal Sums; in *Applications of Fibonacci Numbers*, Volume 8 (edited by G. E. Bergum, et al.),
       Kluwer Academic Publishers, Dordrecht, The Netherlands: 1999. pp. 277-292.
Some Bonnesen-Style Triangle Inequalities. *Missouri Journal of Mathematical Sciences* **14**(2002)75-87.
Mixed exponential and Polynomial Congruences. *Crux Mathematicorum* **28**(2002)431-433.
Consequences of the Pentagon Property. *Geombinatorics* **14**(2005)208-220.

## PREPRINTS

Arrangements of Central Points on the Faces of a Tetrahedron, preprint 2005
Pseudo Incircles, preprint, 2005

## PROBLEMS AND SOLUTIONS

I have had original problems and solutions published in the following journals:

*Arbelos*  
*AMATYC Review*  
*American Mathematical Monthly*  
*College Mathematics Journal*  
*Crux Mathematicorum*  
*Elemente der Mathematik*  
*Fibonacci Quarterly*  
*Journal of Recreational Mathematics*  
*Mathematical Mayhem*  
*Mathematical Spectrum*  

*Mathematics and Computer Education*  
*Mathematics and Informatics Quarterly*  
*Mathematics Magazine*  
*Mathematics Student Journal*  
*Math Horizons*  
*Missouri Journal of Mathematical Sciences*  
*Pentagon*  
*Pi Mu Epsilon Journal*  
*School Science and Mathematics*  
*Siam Review*  

A complete list of all my original problem proposals can be found at www.StanRabinowitz.com/myProblems.pdf

## WEB SITES:

MathPro Press web site     www.MathProPress.com  
Stanley Rabinowitz's home page     www.StanleyRabinowitz.com  
Problem Corner (online collection of 20,000 math problems)     www.ProblemCorner.org

## WEB PUBLICATIONS:

Elementary Mathematics Journals     www.mathpropress.com/elementaryJournals.html  
Index to Problems from the College Math Journal     www.mathpropress.com/cmj/subjectIndex.html  
Internet Center for Mathematics Problems     www.mathpropress.com/mathCenter.html  
Journals with Problem Columns     www.mathpropress.com/problemJournals.html  
Journals that review Mathematics Books     www.mathpropress.com/MathBookReviewers.html  
Mathematics Competitions     www.mathpropress.com/competitions.html  
Mathematics Problem Books     www.mathpropress.com/mathBooks  
MathPro Classification Scheme     www.mathpropress.com/scheme.html  
MathPro Press Style Guide     www.mathpropress.com/preferences/preferences.html  
On-line Glossary of Technical Notation     www.mathpropress.com/notation/notation.html  
On-line Mathematics Dictionary     www.mathpropress.com/glossary/glossary.html  
Papers Published by Stanley Rabinowitz     www.StanleyRabinowitz.com/bibliography  
Problems Published by Stanley Rabinowitz     www.StanleyRabinowitz.com/myProblems.pdf  
Simple Algebraic Structures     www.mathpropress.com/groupoids/groupoids.html  
TeX Cookbook     www.mathpropress.com/cookbook/cookbook.html

## Mathematica Packages I Have Written:

algorithms for cyclotomic polynomials  
fibonacci simplification  
trig simplification  
reciprocal sums of fibonacci numbers  
tribonacci algorithms  
points in tetrahedron

# PROFICIENCIES:

### LANGUAGES:

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|---|---|
| Enough to read technical papers: | French, German |
| Proficient in the following computer languages: | APL, BLISS, C, C++, FORTRAN, SNOBOL4, TECO |
| Have written programs in the following languages: | ALGOL, BASIC, DIBOL, FOCAL, PASCAL, PL/I |
| Wrote compilers for: | DIBOL, SNOBOL4, PDP-8 Assembly Language |

### MATHEMATICAL  SOFTWARE:

| | |
|---|---|
| Cabri Geometry | www.pandd.demon.nl |
| Geometer's Sketchpad | www.keypress.com/sketchpad |
| Mathematica | www.wolfram.com |
| TeX | www.bluesky.com |

### COMPUTERS  AND  OPERATING  SYSTEMS:

IBM 7040, IBM 7090, IBM 360,
PDP-8, PDP-12, OS/8, RTS/8
PDP-10, TOPS-10
PDP-11, RT-11, RSTS, VAX-11, VMS
Unix/Linux
Macintosh OS 9, OS X
Windows XP

# HOBBIES:

Roller Coasters
Car Rallying (won many awards)
Murder mysteries
Role Playing
Dungeons and Dragons
Science Fiction
Volleyball
Table Tennis

# REFERENCES:

Prof. Walter E. Mientka      wm84841@alltel.net
    Executive Director (emeritus) of the MAA Committee on High School Contests
Prof. Erwin Lutwak      elutwak@poly.edu
    Polytechnic University
    Department of Mathematics
    98 Tech Place
    Brooklyn, NY 11201-2990
Dr. George Berzsenyi      gberzsenyi@earthlink.net
    13226 Piute Trail
    Pine, CO 80470-9557
Lawrence J. Zimmerman      lzim@tiac.net
    Teacher (retired), Brooklyn Tech HS
    Brooklyn, NY
    400 Rugby Road
    Brooklyn, NY 11226-5672