

USAMO Newsletter

1989

What's News

The following news items include: 1. bits of information supplied by 63 of the 102 USAMO winners through 1988 who responded to requests for news items - along with additions, changes and corrections to the 1988 USAMO Newsletter; 2. information relative to the 5 members of the 1989 IMO team to the Federal Republic of Germany (F.D.R.) who were 1989 USAMO winners and 1988 Putnam results; 3. miscellaneous news items in which readers may be interested.

1. ASH, David W. 77C Escondido Village, Stanford, CA 94305; recently began research, Stanford, in Knowledge Systems Lab (artificial intelligence group) and is joining a project that will provide physicians with advice in treatment of intensive care unit patients; asheks1.stanford.edu; Father: Leslie Ash, M.D., 32 Walmesley Pl., Bellevue, Ont. K8P 1H3
2. BLOCH, Daniel 909 Elm St., Marlborough, MA 01782
3. BRAY, Hubert L. 5507 Valkeith, Houston, TX 77096; '88 Putnam: H; single; IMO: 3rd prize, Australia, '88

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The USAMO Newsletter, a joint project of the Department of Mathematics, State University of New York at Albany and the AT&T Bell Labs, Warren, NJ, is produced yearly.

Editor: Nura D. Turner
Co-Editor: Tsz-Mei Ko

4. BULTEN, John J. 9225 S. 85th E. Ave., Tulsa, OK 74133; '88 Putnam II, recently coauthored a *Dictionary of 4,573 Crucial Crosswords and Their Clues* with Franklin Kemp and Richard Curby
5. CARLSON, Eric D. Ph.D., Physics, *Phenomenology of Weakly Interacting Particles*, Harvard, '88, Miller Res. Fellow, Lawrence Berkeley Labs, Berkeley 94720; carlson@LBL.bitnet
6. CARLTON, David B. IMO: 3rd prize, F.D.R., '89
7. CROSS, William P. Spent the 2nd semester of the '88-'89 year at Budapest semesters in math
8. DALBEC, John P. B.S. awarded Summa Cum Laude, Combined Sciences, '88 Youngstown St. Univ., 3rd yr. medicine, Northeastern Ohio Univ. Coll. of Med. May add a M.S. math after M.D.
9. DAVIDSON, Douglas R. 954 Euclid Ave., Berkeley, CA 94708; dvd@garnet.berkeley.edu.; Dept. of Physics, Berkeley 94720; NSF grad fellowship
10. DOUGHERTY, Randall L. Assistant Professor, Mathematics, Ohio State University, (tenure track); At Los Alamos summers '88, '89
11. EKL, Randy L. 111 S. Baybrook Dr., #108, Palatine, IL 60067, Engineering Group Leader, Motorola, Schuamberg, IL 60196; M.S., Computer Science, University of Illinois, Chicago, '89, married '88, has received a Communication Protocol Patent
12. ELLENBERG, Jordan S. 10801 Larkmeade Ln., Potomac, MD 20854; IMO: 1st prize, Cuba '87, 2nd prize Australia '88, 1st prize F.D.R. '89; awarded an AMS 3rd prize at the International Science and Engineering Fair for the paper, *An Investigation of k-ary n-tuples of Integers*, May '89; Harvard freshman, math
13. FELDMAN, Paul N. '88-'89 spent in Jewish studies, Yeshiva "Keser Torah", Jerusalem, Israel; studies to be pursued '89-'90
14. FINN, Michael V. 21 Humbert St., Princeton, NJ 08542, 609-924-3934; MVfinn@fine.princeton.edu
15. GILBERT, George T. married to Rhonda Hatcher, sons: Nolan (9/86) and Alex (4/89)
16. GRABINER, David J. djgrabin@phoenix.princeton.edu, '88 Putnam P (Fellow)
17. HAJEK, Bruce E. recently elected Fellow IEEE; Editor IEEE Transactions on Information Theory 9/89; hajek@uicls.csl.uiuc.edu
18. HAN, Zinkoo B.A. History, Haverford, '89; looking for position

19. HERDEG, Paul M. Litigation focused on large scale class-action suits against a small loan co., an appliance rental chain, and a company owning several "business colleges", served as Editor-in-Chief of *Ohio Consumer Law*, 2nd ed.; summer '88 organized a regional training seminar for consumer rights lawyers, in May '89 gave a workshop on consumer law at annual Ohio State Bar Assoc. Convention; Wife, Sharon (B.A.), now director of community organizing at West Side Community House.
20. HORWAT, Waldemar P. M.S., Computer Science, MIT '89; NSF and ONR fellowships; starting work on Ph.D., Computer Science, MIT, continuing classes in math - interested in number theory; 9 Fort Washington Place, Cambridge, MA 02139, 617-864-5232 waldemar@hx.lcs.mit.edu
21. JOCKUSCH, William C. Dept. of Math., MIT 2-230; jockusch@math.mit.edu
22. KATZ, Sheldon H. Katz%nemo.math.okstate.edu@relay.cs.net
23. KEANE, Joseph B.S., Mathematics and Computer Science, expected '90
24. KELLY, Reed B.A., Mathematics, Empire State College, '89; 242 Baltic St., #17, Brooklyn 11201-6442; (718) 855-9027; Bankers Trust, (212) 250-3715
25. KO, Tsz-Mei Taking leave of absence from AT&T Bell Labs, Warren, NJ 9/89 to work on a Ph.D. in Electrical Engineering (information and coding theory) Cal Tech; may or may not continue as co-editor USAMO Newsletter
26. KRESCH, Andrew N. IMO: 2nd prize, F.D.R., '89
27. KUBO, Tal IMO: 2nd prize, Australia, '88; working on B.A. math, Harvard, expected '92; scholarship Boston Harvard Club; '88 Putnam: Honorable Mention
28. LEE, Rocky Spending the summer travelling in Asia: Korea, Taiwan, Hong Kong and Bangkok
29. LYONS, Russell A. '89 summer at Univ. of Paris-North, visiting J.F. Mela. F. Parreau, and B. Host, participating in mini-conference on harmonic analysis and ergodic theory and thinking about probability and amenability; travel in Norway followed by his return to his Assistant Professorship at Stanford
30. MAVERICK, Vance 2315 McGee Ave., Berkeley, CA 94703
31. MIFFLIN, Richard T. Research Specialist, Oil Production Research; promoted to Research Specialist and Group Leader for Application Development and Support, keeping very busy because he now has administrative as well as technical duties

32. MOEWS, David A.B. awarded Summa Cum Laude, Mathematics, Harvard '89; '88 Putnam: P (3rd time Fellow); '89 summer participating in Joseph Gallian's undergrad res. program in combinatorics (U. of MN Duluth)
33. NISONGER, Thomas M. Plans for grad work on indefinite hold
34. PATRICK, David M. Beginning soph. yr. in Mathematics and Computer Science, Carnegie-Mellon; dp2k+@andrew.cmu.edu
35. PATRUNO, Gregg N. Associate, Mortgage Research, First Boston, New York; Associate Director U.S.A. team to IMO; served as Chairman of USAMO Committee 1988-89 while Prof. Ian Richards recuperated from serious illness
36. POONEN, Bjorn M. A.B., Mathematics, Harvard '89; grad study, math, Berkeley; '88 Putnam: P (Fellow for the 4th time); home zip: 01890
37. PROPP, James G. Adjunct Assistant Professor, Mathematics, Berkeley; 2703 Ridge Rd., #202, Berkeley, CA 94709; propp@cartan.berkeley.edu
38. PUCKETT, Miller J. seismoircam!msp
39. REITER, Ehud with NSF grad and IBM pre-doc fellowships, expects Ph.D. '90; reiter@harvard.harvard.edu (arpa).reiter@harvard(bitnet.uncp) main hobby continues to be travelling; in the summer of '88 visited Australia and Papua, New Guinea and in the summer of '87 went to Ecuador and Peru
40. ROCHE, James R. Ph.D. in Electrical Engineering in '90; has had a 1 yr. IBM grad fellowship; recently spent 5 days in a minimum-security jail for peacefully blockading an abortion clinic - the barracks, Franklinesque schedule and recreation were reminiscent of the MOP.
41. RUBIN, Arthur L. Senior Programmer, Ideal Soft. Inc., Alhambra, CA 91803; P.O. Box 2437, San Gabriel, CA 91778; UUCP: ...!crash!gryphon!pnet02!arthur; ARPA: crash!gryphon!pnet02!arthur@nosc; INET: arthur@pnet02.cts.com
42. RUBIN, Karl C. Dept. of Math., Ohio State Univ., Columbus, 43210; ts66@ohstvm (bitnet); in addition to many honors and awards received, he has been given the Presidential Young Investigator Award, '88-'93.
43. SCALES, David J. working on Ph.D., Computer Science, Stanford with a NSF grad. fellowship; has passed his first level qualifier; scales@polya.stanford.edu
at home: Rains Houses, Box 128, Stanford, CA 94305

44. SCHNEEBERGER, William A. Soph. at Duke, math/physics
45. STARR, Edith N. Married 6/88 to Ben Lotto, Ph.D. math (functional analysis) '87; has NSF grad fellowship; elotto@nsfl.mth.msu.edu; 2371F Stonehedge Dr., East Lansing, MI 48823
46. STEINKE, John M. NSF grad fellowship; Butler Apts., Princeton 08544
47. STEPHANIDES, Adam L. Working on Ph.D., American History since 1815; Phi Beta Kappa; 905 S. Busey Ave., Urbana, IL 61801
48. TAYLOR, Washington IV B.S. Math, Stanford, '86; working on Ph.D. physics, Berkeley; wati@garnet.berkeley.edu; 189 Fairlawn Dr., Berkeley, CA 94708
49. TSCHANTZ, Steven T. Dissertation: *Constructions in Clone Theory*; 136 Acklen Pk. Dr., Nashville, TN 37203; tschanst@vuctrvax.bitnet
50. TUNG, Yeh-Ching (Brian) B.S., Electrical Engineering and Computer Science, Berkeley, '89; starting work on Ph.D., Computer Science (network modelling and analysis), UCLA
51. VAKIL, Ravi D. IMO, Canadian Team: 1st prize, Australia, '88, 2nd prize, F.D.R., '89; as freshman ranked Fellow in Putnam; study interests reduced to internat'l relations, math and physics
52. VANDERBILT, David H. Associate Prof. Physics, Harvard; dissertation: *A Theoretical Study of Defects in Amorphous Semiconductors*; has an Alfred P. Sloane Foundation Fellowship ('88-'90); daughters Karen and Sarah now 6 and 3
53. VANDERKAM, Jeffrey M. IMO: 2nd prize, F.D.R., '89; 2217 Lash Ave., Raleigh, NC 27607, (919-781-9095); high school sr.
54. VANDERVELDE, Samuel K. IMO: 2nd prize, F.D.R., '89; made honors group in Westinghouse Talent Search; will be in internat'l science and engineering fair with math paper, *Why not to park your car on a One-Way Street*
55. VINKE, W. David MSc, Electrical Engineering, University of Waterloo, '89; working on Ph.D., Electrical Engineering, University of Waterloo; 208-545 Belmont Ave. W., Kitchener, Ontario N2M 5G7, 519-578-1433; married Jody Frederick 7/29/89

56. VOJTA, Paul A. Associate Professor, Mathematics, Berkeley; during first year at Berkeley on leave at Institute for Advanced Study; has submitted second proof of Mordell's conjecture to the *Annals of Mathematics*; gave a half hour talk at conference, Journees, Arithmetiques, July 17 at Luminy, France; has a Miller Res. Fellowship vojta@spaten.ias.edu (AY '89-90); vojta@cartan.berkeley.edu (before and after)
57. WALTER, Charles H. Assistant Professor, Mathematics, Rutgers Univ.; A.M., Mathematics, Harvard, '85; Ph.D., Mathematics, Harvard, '88, NSF grad fellowship '82-'85; walter@math.rutgers.edu; 459A S. Second Ave., Highland Pk., NJ 08904
58. WEISS, Paul G. Arity Corp., 29 Domino Dr., Concord, MA 02174; weiss@theory.lcs.mit.edu; married Aug. '87 Ruth Weinrib
59. WEPSIC, Eric K. IMO: 2nd Prize, Australia, '88; working on B.A., math, Harvard
60. WILMER, Elizabeth L. working on A.B., Mathematics, Harvard; summer '88 undergrad res. fellowship, Cal Tech; '89 summer participating in Joseph Gallian's undergrad res. program in combinatorics (U. of MN Duluth); member of Harvard's winning '88 math'l modelling contest; '89 fall at Budapest semesters in math; wilmer@husch.harvard.edu; elsiejean@citiago.bitnet
61. YEH, C. James A.B., Physics, Princeton, '87; M.A., Physics, Berkeley, '89; working on a Ph.D., Physics, Berkeley; NSF grad fellowship; 2124 Kittredge St., Box 2124, Berkeley, CA 94704
62. YUEN, David S. Visiting Assistant Professor, University of Rochester; dissertation: *Second Order Theta Functions and Vector Bundles over Jacoby Varieties*; 52 Sheldon Terrace, Rochester, NY 14627; dyue@uhura.cc.rochester.edu; yuen@fine.princeton.edu
63. ZEITZ, Paul working on a Ph.D. math (ergodic theory and dynamical systems); '89 summer working on math Yellowstone Nat'l Pk., where wife (Cathleen Petricle) works as Ranger-Naturalist

1988 and 1989 IMO Results (U.S.A. Team)

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The 1988 IMO, held in Australia came out after the 1st Newsletter. So those results appear here. Team members who were USAMO winners and the prizes they won were: Ellenberg, Jordan S., Kubo, Tal and Wepsic, Erik K., 2nd prizes; Bray, Hubert L., 3rd prize; . Team members not USAMO winners and the prizes they won were: Kutin, Samuel and Woo, John, 2nd prizes. This is the first IMO since our first participation in 1974 at in which we did not have a 1st prize winner.

The 1989 IMO held in the Federal Republic of Germany (F.D.R.) brought another 1st prize - for the 2nd time (1st in '87 at Cuba) - to Ellenberg, Jordan S. with a perfect score of 42; 3 other team members who were USAMO winners won 2nd prizes: Kresch, Andrew H., Vanderkam, Jeffrey M. and Vandervelde, Samuel K.; a 5th team member, not a USAMO winner, Kutin, Samuel, also received a 2nd prize; and Carlton, David B. received a 3rd prize. The total of the scores of our team members ranked 5th, but it was the highest of such scores of Western participating countries. China's was first, Romania's second, that of the U.S.S.R. third and East Germany's (D.D.R.'s) fourth.

1988 Putnam Results

Among the 2,096 contestants from 360 institutions participating in the 49th Putnam competition ('88)

15 USAMO winners ranked 1-207

5 ranked P or Fellow. 1.5 - 5:

David J. Grabiner for 3rd time ('86,'87,'88)

Jeremy A. Kahn, sophomore (N in '87)

David J. Moews for 3rd time ('86,'87,'88)

Bjorn M. Poonen for 4th time ('85,'86,'87,'88)

Ravi D. Vakil, freshman

1 ranked N, next highest to Fellow, 6 - 10.5:

William P. Cross, sophomore

7 ranked H or Honorable Mention, 13 - 47.5:

Daniel J. Bernstein (N in '87)

Hubert L. Bray, freshman

Matthew M. Cook, sophomore

Joseph G. Keane, 2nd time ('87,'88)

Tal N. Kubo, freshman

John A. Overdeck, (N in '86)

Eric K. Wepsic, freshman

2 ranked II, 107-207:

John J. Bulten, freshman

Elizabeth L. Wilmer, 2nd time ('87,'88)

Among the 82 different winners, '72-'88 who have ranked P-II in 235 tries:

1. only 2 have ranked P or Fellow 4 times:
Bjorn M. Poonen (above) and Arthur L. Rubin who ranked Fellow twice while in high school ('70,'71) and twice in college ('72,'73)
2. but 5 have ranked Fellow 3 times:
David W. Ash ('81,'82,'83), Eric D. Carlson ('80,'82,'83),
Randall S. Dougherty ('78,'79,'80), David J. Grabiner ('86,'87,'88)
and David J. Moews ('86,'87,'88) with H in '85
3. the percentages of the 5 rankings, P-II, are: P-26; N-14; H-32;
I-17 and II-11.

Wanted: Proficient Problemists

The American Mathematics Competitions [AMC] always have room for additional proficient problemists to assist in developing the four annual contests:

American Junior High School Mathematics Examination;
American High School Mathematics Examination;
American Invitational Mathematics Examination;
United States of America Mathematical Olympiad.

The pool of former Olympiad winners certainly constitutes a rich source of talent, still largely untapped for this effort. (So far, E. Lander, G. Patruno, B. Poonen and P. Zeitz have been involved in these activities at one time or another.) Any other USAMO winners who have completed their undergraduate work and who would enjoy supporting the AMC by writing new problems, reviewing drafts of tests, or lending their talents in other ways are invited to contact the chair of the AME committee,

Professor Leo J. Schneider
Mathematics Department, John Carroll University
Cleveland, Ohio 44118; (216) 397-4481

to inquire about joining the effort. Many USAMO winners would find the work rewarding!

New Book

USA Mathematical Olympiad, 1972-1986 by Murray S. Klamkin, published winter of '88-'89, represents the first time examinations of the USAMO have been collected in book form. The book includes all problems and solutions as well as a list of winners for the years '72-'86. To inquire about orders, write: The Mathematical Association of America, 1529 Eighteenth Street, N.W., Washington, D.C. 20036. (Learn how the problems should have been solved!)

Basketball

USAMO winners 1975-87, in remembering David P. Roselle, Secretary, MAA, will be interested in learning that since 1987 he has been President of the University of Kentucky. In dealing with the NCAA in its probe of the UK basketball program, he demonstrated his skill of being "politically astute enough to out maneuver everyone": his critics and coaches and administrators who broke the rules. Read *Dodging a Bullet* in the 29 May '89 *Sports Illustrated*.

Retiring

After 21 years of service to mathematics as Executive Director of the MAA, Alfred B. Willcox is leaving his post in September to begin a new period of service to mathematics as Interim Director of the JPBM (Joint Policy Board for Mathematics) Office of Government and Public Affairs. He will hold this office until a permanent Director is named. Along with the office he will assist transition affairs associated with the office of the new Executive Director of the MAA, Marcia P. Sward.

Hewlett-Packard's 50th Anniversary

All of you USAMO winners, 1973-89, are aware of the part Hewlett-Packard has played in awarding you for your outstanding performance in the Olympiad competition. Beginning with 1973 when the company first cooperated in the program by awarding each winner with a HP35, the first electronic hand-held scientific calculator that performed only the 4 basic mathematical operations and made the slide rule obsolete, they continued cooperating by awarding improved machines as they became available until the 50th year (1989) of the company's "looking to the future", when each winner was awarded a HP28S, the most powerful hand-held scientific calculator produced that does not only numerical but exact symbolic integration.

Some of the major technical contributions of Hewlett-Packard during the first 50 years have been their pioneering in the field of the logic analyzer, introduction of a system to diagnose ECGs using the technology of artificial intelligence and their leadership in cost-effective manufacturing of light-emitting diodes.

Some Vital Statistics - including addresses and telephone numbers

The help of the winners is sought for supplying missing data. Contact Miss Turner.

Winner	<u>When First</u> <u>a Winner</u>			<u>How Occupied as of Fall '89</u>
	Year	Age	H.S. Class	
1. AGIN, Richard G.	79	18	12	Lawyer, Sidley & Austin, Chicago, Sidley & Austin, Law Firm, One 1st Nat'l Plaza, 60603, (312-853-7400)
2. ANICK, David J.	72		11	Assoc. Prof. (math), MIT, Dept. of Math, MIT, Cambridge, MA 02139 (617-253-4381)
3. ARENSTORF, Gerhard C.	73		10	Deceased, Parents address: 4633 Benton Smith Rd., Nashville, TN 37215
4. ASH, David W.	80	14	11	Student (grad, comp. sci.) Stanford, Dept. of Math, Stanford Univ., Stanford, CA 94305, (415-725-6284)
5. BARTON, David R.	74		12	Last known at 21 Avenida St., Berkeley, CA 94708
6. BEARD, Bernard B.	75		12	Mech. Engineer, 5002 Fairfield Dr., San Antonio, TX 78228, (512-684-4702)
7. BERNSTEIN, Daniel J.	87	15	12	Student (undergrad, math) Princeton, 5 Brewster Ln., Bellport, NY 11713, (516-286-1339)
8. BLOCH, Daniel L.	78	17	12	Program'r/Analyst, Research Institute of Scripps Clinic, 803 Archer St., San Diego, CA 92109
9. BRAY, Hubert L.	88	17	12	Student (undergrad, math) Rice, 5507 Valkeith, Houston, TX 77096
10. BULTEN, John J.	86	15	10	Temporarily working (Tulsa), 9225 So. 85th E Ave., Tulsa, OK 74133
11. CARLSON, Eric D.	80	18	12	Miller Res. Fellow (physics) Berkeley, Lawrence Berkeley Labs., 50 A-3115 One Cyclatron Rd., Berkeley, CA 94720
12. CARLTON, David	89	18	12	Student (undergrad, math) Harvard, 165 Fairway Dr., Oberlin, OH 44047, (216-774-6542)
13. CHIN, D. Andrew	84		12	Student (grad, math) Oxford, Dept. of Math., Oxford Univ., United Kingdom
14. COOK, Matthew M.	87	17	11	Student (undergrad, math), 123 Keszic St., Evanston, IL 60202, (312-864-1760)

Winner	When First a Winner			How Occupied as of Fall '89
	Year	Age	H.S. Class	
15. CROSS, William P.	86	17	12	Student (undergrad, applied math) Cal Tech, 2205 Tamarack, Kalamazoo, MI 49007, (616-349-1842)
16. DALBEC, John P.	85		12	Student (undergrad, medicine) Northeastern Ohio Universities College of Medicine, 1984 Innwood Dr., Youngstown, OH 44515, (216-793-1251)
17. DAVIDSON, Douglas R.	83		11	Student (grad, physics) Berkeley, Dept. of Physics, Univ. of CA, Berkeley, CA 94720
18. DAVIS, Ernest S.	73		11	Ass't. Prof. (comp. sci.), New York Univ., Dept. of Comp. Sci., New York Univ., NY 10012
19. DOUGHERTY, Randall S.	76	15	10	Ass't. Prof. (math) Ohio State University, Dept. of Math., Ohio State Univ., Columbus, OH 43210, (614-292-4975)
20. EKL, Randy	79	17	12	Engineering Group Leader, Motorola, Schaumburg, IL, 111 So. Baybrook Dr., #108, Palatine, IL 60067
21. ELKIES, Noam	81	14	11	Junior Fellow (math) Harvard, 25 Montgomery St., New York, NY 10002, (212-962-4734)
22. ELLENBERG, Jordan	88	16	11	Student (undergrad, math) Harvard, 10801 Larkmead Ln., Potomac, MD 20854, (301-299-9039)
23. FELDMAN, Paul N.	80	17	12	Student (postgrad, religious studies) Israel, 105-68 Ave. L., Brooklyn, NY 11236
24. FINN, Michael V.	79	16	11	Student (grad, math) Princeton, Dept. of Math., Princeton Univ., Princeton, NJ 08540, (609-452-5791)
25. FISCHMAN, Joshua B.	88	15	10	Student (high school sr.), 6908 Millwood Rd., Bethesda, MD 20817, (301-299-9250)
26. FISHER, Benji N.	81	17	12	Student (grad, math) Princeton, 701 Brian Ct., Princeton, NJ 08540, (609-924-5774)
27. GELLER, Alan S.	75		12	1020 Ravitan Ave., Highland Pk, NJ 08904
28. GILBERT, George T.	74		11	Ass't. Prof. (math) St. Olaf College, 728 Lathrop Dr., Northfield, MN 55057, (507-645-7194)
29. GRABINER, David J.	84		10	Student (undergrad, math) Princeton, 424 W. 7th St., Claremont, CA 91711, (714-624-4185)
30. HAJEK, Bruce E.	73		12	Professor (elec. engineering & comp. sci.) Univ. of IL (Urbana), 1101 W. Springfield Ave., Urbana, IL 61801, (217-333-3605)

Winner	When First a Winner			How Occupied as of Fall '89
	Year	Age	H.S. Class	
31. HAN, Zinkoo	85		12	Looking for job, 145 Elmira Loop 8Q, Brooklyn, NY 11239, (718-642-9438)
32. HARRINGTON, Paul D.	72		12	Sr. Comp. Prog'r./Analyst, State of NY, 1247 Garner Ave., Schenectady, NY 12309, (518-377-0876)
33. HEMPHILL, T. Scott	72		12	Student (grad, comp. sci.) Cal Tech, 1439 Topeka St. Pasadena, CA 91104, (818-794-3779)
34. HERDEG, Paul M.	74	16	10	Lawyer, Cleveland Legal Aid Society, Cleveland, 2499 Queenston Rd., Cleveland Hts., OH 44118, (216-321-5688)
35. HIGA, Jonathan T.	89	16	11	Student (high school sr.), 807 21st Ave., Honolulu, HI 96816, (808-735-9478)
36. HIRSCH, Martin D.	73		12	Sr. Engineer, Litton Acre Products, 1748 Sinoloa Rd. #258, Simi Valley, CA 93065, (805-583-4410)
37. HORWAT, Waldemar P.	85		12	Student (grad, comp. sci.) MIT, 9 Fort Washington Pl., Cambridge, MA 02139, (617-864-5232)
38. HUNT, Brian R.	81	15	11	Expected Ph.D., math, Stanford, '89, 902 Daleview Dr., Silver Spring, MD 20901, (301-434-8923)
39. JOCKUSCH, William C.	84		12	Student (grad, math) MIT, MIT 2-230, 77 Mass Ave., Cambridge, MA 02139, (617-253-4381)
40. JUNGREIS, Douglas	82	15	11	Student (grad, math) Berkeley, Dept. of Math, Univ. of CA, Berkeley, CA 94720
41. KAHN, Jeremy A.	83	14	9	Student (undergrad, math) Harvard, 155 W. 78th St., New York, NY 10024, (212-799-2464)
42. KAMINSKY, Ronald F.	77	16	10	Student (grad, appl'd math) Weizmann Inst. of Sci., Israel
43. KATZ, Sheldon H.	73		10	Ass't. Prof., (math), Oklahoma State Univ., 1609 Wildwood, Stillwater, OK 74075
44. KEANE, Joseph G.	84	16	10	Student (undergrad, math/comp. sci.) Carnegie-Mellon 207 Springhouse Ln., Pittsburgh, PA 15238, (412-963-9432)
45. KELLY, Reed	75	16	11	Systems Programmer, Banker's Trust, NY, 242 Baltic St. #17, Brooklyn, NY 11201-10006, (212-250-3715)
46. KLEIMAN, Mark P.	76	15	10	Assoc., Mergers and Acquisitions Dept., Salomon Bros., Inc., NY, 468 W. 23rd St., New York, NY 10011, (212-627-1943)

Winner	When First a Winner			How Occupied as of Fall '89
	Year	Age	H.S. Class	
47. KNIERIM, Daniel G.	76	18	12	Principal Engineer, Tektronix Inc., Beaverton, OR 74075, (405-372-5936), 1470 S.W. Barlow Rd., Beaverton, OR 97005, (503-644-7737)
48. KO, Tsz Mei	82	17	12	Student (grad, elec. engineering) Cal Tech, Dept. of Electrical Eng., Cal Tech
49. KRESCH, Andrew H.	89	16	12	Student (undergrad, math) Yale, 1632 Mount Pleasant Rd., Havertown, PA 19083, (215-853-1054)
50. KUBO, Tal	88	18	12	Student (undergrad, math) Harvard, 14 Garrison Rd., Brookline, MA 02146, (617-566-3076)
51. LANDER, Eric S.	73		11	Ass't. Prof. (managerial economics), Harvard, 337 Morgan Hall, Harvard, Cambridge, MA 02138
52. LARSEN, Michael J.	77	15	9	Student (grad, math) Princeton, 6 Fessenden Way, Lexington, MA 02173, (617-861-0496)
53. LEE, Rocky	87	17	12	Student (undergrad, biology/premed) Harvard, 66 Glenwatford Dr., Scarborough, Ontario, M1S-2C5, (416-297-5073)
54. LEFKOWITZ, Darien G.	86	17	12	Deceased
55. LYONS, Russell D.	75		12	Ass't. Prof. (math), Stanford, Dept. of Math., Stanford Univ., Stanford, CA 94305
56. MAVERICK, Vance	82	16	12	Student (grad, c. s.) Berkeley, Dept. of Comp. Sci., Univ. of CA, Berkeley, CA 94720, (415-642-3214)
57. MIFFLIN, Richard T.	76	17	12	Research Specialist, Oil Production Research, EXXON, Houston, 5401 Chimney Rock #700, Houston, TX 77081, (713-664-4324)
58. MILENKOVIC, Victor J.	77	16	11	Dept. of Comp. Sci., Harvard, Cambridge, MA 02138, (617-495-2833)
59. MODZELEWSKI, Stephen W.	74		11	28 Meadow Ln., Pennington, NJ 08534
60. MOEWS, David J.	84		11	Student (grad, math) Berkeley, Dept. of Math., Univ. of CA, Berkeley, CA 94720, (415-642-4120)
61. MONTANA, David J.	78	17	12	Scientist, BBM Laboratories, Cambridge, MA, 88 Park Ave., Apt. 104, Arlington, MA 02174, (617-641-1611)
62. MUNOZ, Demetrio A.	89	15	11	Student (high school sr.), 1372 Titania Ln., McLean, VA 22102, (703-734-0546)
63. NEWMAN, Steven	83		11	Senior Designer, Aston Tate, Campbell, CA, 520 Univ. Ave., Los Gatos, CA 94030, (408-395-8424)

When First
a Winner How Occupied as of Fall '89

Year Age H.S. Class

Winner

- | | | | | |
|-------------------------|----|----|----|--|
| 64. NGUYEN, Nhat | 88 | 15 | 9 | Student (high school jr.), 248 West Norwich Ave., Columbus, OH 43201, (614-299-3503) |
| 65. NISONGER, Thomas M. | 74 | | 12 | Assoc. Programmer, IBM, Poughkeepsie, NY, Village Crest Apts., #G-15, Poughkeepsie, NY 12603, (914-462-8097) |
| 66. O'NEIL III, John T. | 83 | | 12 | No information |
| 67. OVERDECK, John A. | 85 | | 11 | Student (undergrad, math/stat) Stanford, 10300 Greek Boy Pl., Columbia, MD 21044, (301-997-0241) |
| 68. PATRICK, David M. | 88 | 16 | 12 | Student (undergrad, math/comp. sci.) Carnegie-Mellon 3 Fordham Dr., Batavia, NY 14020, (716-344-1867) |
| 69. PATRUNO, Gregg N. | 81 | 16 | 12 | Associate, Mortgage Res. First Boston, NY, 353 Gifford Ln., Staten Is., NY 10055, (718-356-2172) |
| 70. PENN, Laurence E. | 79 | 17 | 12 | V.P. Secured Offerings, Shearson, Lehman Hutton, NY in charge of analysis, 221 E. 78th St., New York, NY 10021, (212-628-5554) |
| 71. PLESZKOCH, Mark G. | 79 | 18 | 12 | Last known to be Staff Programmer, IBM, Bethesda, MD 284 Munson St., Wheaton, MD 20902, (301-942-6519) |
| 72. POONEN, Bjorn M. | 85 | | 12 | Student (grad, math) Berkeley, Dept. of Math., Univ. of CA, Berkeley, CA 94720, (415-642-4120) |
| 73. PRIMER, Jeremy D. | 80 | 15 | 11 | 21 Edgewood Pl., Maplewood, NJ 07040, (201-762-5292) |
| 74. PROPP, James G. | 77 | 17 | 12 | Adjunct Ass't. Prof. (math), Berkeley, Dept. of Math., Univ. of CA, Berkeley, CA 94720, (415-642-4120) |
| 75. PUCKETTE, Miller S. | 75 | 16 | 11 | Research Scientist, IRCAM, Paris, France, IRCAM 31, rue St. Merri, 7500 4 Paris, France |
| 76. RAHER, Steven J. | 72 | | 12 | Sr. Software Eng., Dynamics Res., Wilmington, MA, 8 Stage Fort Acres, Gloucester, MA 01930-4056, (617-283-2443) |
| 77. REID, Michael | 83 | | 11 | 84-33 90th St., Woodhaven, NY 11421, (718-441-8030) |
| 78. REITER, Ehud | 78 | 17 | 12 | Student (grad, c. s.) Harvard, Aiken Computational Lab, Harvard Univ., Cambridge, MA 02178 |
| 79. ROCHE, James R. | 81 | 17 | 12 | Student (grad, elec. engineering) Stanford, 313 Sheridan Ave., Palo Alto, CA 94306, (415-322-7650) |

Winner	When First a Winner			How Occupied as of Fall '89
	Year	Age	H.S. Class	
80. RUBIN, Arthur L.	72		12	Sr. Programmer, Ideal Soft, Alhambra, CA, P.O. Box 2437, San Gabriel, CA 91778-2437, (818-287-6011)
81. RUBIN, Karl C.	73		12	Professor (math) Ohio State University, Dept. of Math., Ohio State Univ., Columbus, OH 43210, (614-292-4975)
82. RUSCZYK, Richard	89	17	12	Student (undergrad, chem. engineering) Princeton, 3214 Trails End, S.W., Decatur, AL 35603, (205-355-0602)
83. SAXE, James B.	72		12	Principal Software Engineer, Digital, Palo Alto, CA, 1072 Tanland Ave., Palo Alto, CA 94302
84. SCALES, Daniel J.	80	16	11	Student (grad, c. s.) Stanford, Dept. of Math., Stanford Univ., Stanford, CA 94305, (415-725-6284)
85. SCHNEEBERGER, William A.	87	16	11	Student (undergrad, math/physics) Duke, 1903 12th St., Columbus, GA 31906, (404-322-7813)
86. SHEARER, James B.	72		12	Research Staff Member, IBM, Yorktown Hts., 40 Overlook Rd., Ossining, NY 10562
87. SHOR, Peter W.	77	17	12	Member of Technical Staff, AT&T, Murray Hill, 48 Edgewood Ave., New Providence, NJ 07974, (201-582-4435)
88. SMITH, Bruce W.	79	18	12	Computer Programmer, Wolfram Res., 57 Glenside Way, San Rafael, CA 94903, (415-479-4917)
89. STARR, Edith N.	82	18	12	Student (grad, math) Berkeley, 2371F Stonehenge Dr. East Lansing, MI 48823
90. STEINKE, John M.	83	16	12	Student (grad, math) Princeton, Butler Apts., Princeton Univ., Princeton, NJ 08540
91. STEPHANIDES, Adam L.	76			Student (grad, Amer. Hist.) Univ. of IL, Urbana, 905 So. Busey Ave., Urbana, IL 61801
92. STONG, Richard A.	81	17	12	Student (grad, c. s.) UCLA, Dept. of Math., Harvard Univ., Cambridge, MA 02138
93. TAYLOR IV, Washington	82	17	12	Student (grad, physics) Berkeley, Dept. of Physics, Univ. of CA, Berkeley, CA 94708
94. TSCHANTZ, Steven T.	75		12	Ass't. Prof. (math) Vanderbilt, 136 Acken Pk. Dr., Nashville, TN 37203
95. TUNG, Yeh-Ching (Brian)	85		12	Student (grad, c. s.) UCLA, Dept. of Comp. Sci., UCLA, Los Angeles, CA

When First
a Winner How Occupied as of Fall '89

Winner	Year	Age	H.S. Class	
96. VAKIL, Ravi D.	86	16	11	Student (undergrad, math, physics, or internat'l rel.), 3 Kingscross Square, Toronto, Ontario, M82 4M4, (416-232-1937)
97. VANDERBILT, David H.	72		12	Assoc. Prof. (physics) Harvard, Dept. of Physics, Harvard Univ., Cambridge, MA 02138
98. VANDERKAM, Jeffrey M.	89	17	11	Student (high school sr.), 2217 Lash Ave., Raleigh, NC 27607, (919-781-9095)
99. VANDERVELDE, Samuel K.	87	16	10	Student (undergrad, math) Swarthmore, 206 N. Main St., Amherst, VA 24521, (804-946-2603)
100. VINKE, David W.	82	18	12	Student (grad, elec. engineering) Univ. of Waterloo 545 Belmont Ave., Kitchener, Ontario, N2M-5B7, (804-946-2603)
101. VOJTA, Paul A.	75		12	Assoc. Prof. (math) Berkeley, School of Math., Inst for Adv'd Study, Princeton, NJ 08540
102. WALTER, Charles H.	78	16	12	Ass't. Prof. (math, postdoc) Rutgers, Dept. of Math., Rutgers Univ., New Brunswick, NJ 08903
103. WEISS, Paul G.	77	16	12	V.P. (R&D) Arity Corp., Concord, MA, 43 Harlow St., Arlington, MA 02174, (617-371-1243)
104. WEPSIC, Eric K.	86	16	10	Student (undergrad, math) Harvard, 84 Prince St., Boston, MA 02130, (617-524-0894)
105. WILMER, Elizabeth Lee	87	16	12	Student (undergrad, math) Harvard, 700 Scarsdale Ave., #2U, Scarsdale, NY 10583, (914-723-2956)
106. YEH, C. James	83	18	12	Student (grad, physics) Berkeley, Dept. of Physics, Univ. of CA, Berkeley, CA 94708
107. YUEN, David S.	81	18	12	Visiting Ass't. Prof. (math) Univ. of Rochester, 52 Sheldon Terrace, Rochester, NY 14619, (716-275-4411)
108. ZEITZ, Paul A.	74		11	Student (grad, math) Berkeley, 1064 9th St., Albany CA 94710

Commentary - on selection of members of U.S.A. team to the IMO

Might consideration be given to selecting the members of our team only from the 8 U.S.A. winners that for reference I'll call Group 1, rather than from the membership of the short 3 or 4 week training program (MOP) that precedes our sending a team to the IMO that I'll call Group 2? Supporters of Group 2 base their attitude on *competing-to-beat* that is, competing with the purpose of achieving a total of the scores of team members that would be greater than such totals of other teams. But that was not the aim of the "father" of the IMO, Tiberiu Roman, who as the one responsible for the founding of the IMO, organized the first competition held in Romania in 1959 at which only Eastern European countries were invited and 7 attended and organized it as a competition of individuals - not as one of teams.

We don't need to do what some other countries are doing: China, for example that trains 60 students for 6 months and then chooses its team of 6, or the U.S.S.R. that assigns 6 professors to work for a year with 6 students selected a year in advance as team members to the IMO. Moreover we don't need to do what we are doing to perform well: include non-USAMO winners as team members to the IMO that show up with test scores, during the first few days of our short training period, higher than scores of some USAMO winners. A look at our IMO results, 1974-1989, provide justification for that contention.

First a look at our prizes at the IMO's. In comparing average prize ratings of our prize winners assigning a 1 to 1st prize, 2 to a 2nd prize and to a 3rd prize and 4 to no prize, the average for Group 1 (team members all USAMO winners) is 2.132. The average for Group 2 (team members not all USAMO winners) is 2.246. This difference may or may not be significant. Next a look at the ranking of the total scores of our team members over the years '74-'89 shows Group 1 vs. Group 2 as 2.55 to 4. I dare say this difference is significant.

Just where might this *compete-to-beat* sideplay end up? The 8 winners of a USAMO in accordance with competitions in other activities - academic or otherwise - have earned the right to provide the 6 members of a team to an IMO, and whether or not such a team beats others is not the important point. What is important is the early life experiences of team members mingling in friendly mathematical contact with young people of nations of the world with whom they are likely to mingle mathematically in future years.

John D. Turner

U.S.A. IMO PRIZES (1974-89)

<u>Year</u>	<u>Prizes</u>		
	First	Second	Third
D.D.R., 1974		Arenstorf, Gerhard C. Barton, David R. Lander, Eric S. Modzelewski, Stephen W. Nisonger, Thomas M.	Herdeg, Paul M. Zeitz, Paul A. * ₁ Oman, Douglas W.
Bulgaria, 1975	Herdeg, Paul M. Puckette, Miller P. Vojta, Paul A.	* ₂ Modzelewski, Stephen W.	Kelly, Reed Lyons, Russell A. Tschantz, Steven T.
Austria, 1976	Kleiman, Mark P.	Dougherty, Randall L. Herdeg, Paul M. Knierim, Daniel G. Puckette, Miller P.	Kelly, Reed
Yugoslavia, 1977	Dougherty, Randall L. Larsen, Michael J.	Kleiman, Mark P. Milenkovic, Victor J. Shor, Peter N.	Propp, James G.
Romania, 1978	Kleiman, Mark P.	Dougherty, Randall L. Milenkovic, Victor J. Reiter, Ehud	* ₃ Bernoff, Andrew Montana, David J. Walter, Charles H.
U.K., 1979	Larsen, Michael J.	Pleszkoch, Mark G. Smith, Bruce K.	Finn, Michael V. Penn, Laurence E.
U.S.A., 1981	Elkies, Noam D. Fisher, Benji N. Hunt, Brian R. Primer, Jeremy D.	Patruno, Gregg N. Roche, James R. Stong, Richard A.	Yuen, David S.
Hungary, 1982	Elkies, Noam D.	Hunt, Brian R. Taylor, Washington IV	Jungreis, Douglas
France, 1983	Reid, Michael	Jungreis, Douglas S. Kahn, Jeremy A. Newman, Steven	Steinke, John M. Yeh, C. James
Czechoslovakia, 1984	Moews, David J.	Grabiner, David J. Kahn, Jeremy A. Newman, Steven Reid, Michael	Davidson, Douglas

<u>Year</u>	<u>Prizes</u>		
	First	Second	Third
Finland, 1985	Kahn, Jeremy A. Horwat, Waldemar P.	Grabiner, David J. Keane, Joseph G. Moews, David J. Poonen, Bjorn M.	
Poland, 1986	Grabiner, David J. Kahn, Jeremy A. Keane, Joseph G.	Cross, William P. Lefkowitz, Darien G. Overdeck, John A.	
Cuba, 1987	Ellenberg, Jordan S. Wepsic, Erik K.	Schneeberger, William A. * ₄ {Southworth Woo, John	Cook, Matthew M.
Australia, 1988		Ellenberg, Jordan S. Kubo, Tal Wepsic, Erik K. * ₅ {Kutin, Samuel Woo, John	Bray, Hubert L.
F.D.R., 1989	Ellenberg, Jordan	Kresch, Andrew H. Vanderkam, Jeffrey M. Vandervelde, Samuel K. * ₆ Kutin, Samuel	Carlton, David B.

- *₁ not a winner, replaced Gilbert
- *₂ 1976 winner, replaced Geller
- *₃ not a winner, replaced Larsen
- *_{4, 5, 6} not winners but selected thru MOP tests

*No IMO held in 1980

1988 IMO (29th)

First Day, Canberra, July 15, 1988

1. Consider two coplanar circles of radii R and r ($R > r$) with the same centre. Let P be a fixed point on the smaller circle and B a variable point on the larger circle. The line BP meets the larger circle again at C . The perpendicular l to BP at P meets the smaller circle again at A (if l is tangent to the circle at P then $A = P$).
 - (i) Find the set of values of $BC^2 + CA^2 + AB^2$.
 - (ii) Find the locus of the midpoint of AB .

2. Let n be a positive integer and let $A_1, A_2, \dots, A_{2n+1}$ be subsets of a set B . Suppose that
 - (a) each A_i has exactly $2n$ elements,
 - (b) each $A_i \cap A_j$ ($1 \leq i < j \leq 2n+1$) contains exactly one element, and
 - (c) every element of B belongs to at least two of the A_i .

For which values of n can one assign to every element of B one of the numbers 0 and 1 in such a way that each A_i has 0 assigned to exactly n of its elements?

3. A function f is defined on the positive integers by

$$\begin{aligned} f(1) &= 1, & f(3) &= 3, \\ f(2n) &= f(n), \\ f(4n+1) &= 2f(2n+1) - f(n), \\ f(4n+3) &= 3f(2n+1) - 2f(n), \end{aligned}$$

for all positive integers n .

Determine the number of positive integers n , less than or equal to 1988, for which $f(n) = n$.

Time: 4.5 hours

Each problem is worth 7 points.