

THE WILLIAM LOWELL PUTNAM MATHEMATICAL COMPETITION

ANNOUNCEMENT OF WINNERS of the sixty-fifth competition held on December 4, 2004

WINNING TEAMS

<i>Rank</i>	<i>School</i>	<i>Team Members (in alphabetical order)</i>
1	MASSACHUSETTS INSTITUTE OF TECHNOLOGY	Reid W. Barton, Daniel M. Kane, and Emanuel I. Stoica
2	PRINCETON UNIVERSITY	Ana Caraiani, Suehyun Kwon, and Mihai Manea
3	DUKE UNIVERSITY	Nikifor C. Bliznashki, Oaz Nir, and Lingren Zhang
4	UNIVERSITY OF WATERLOO	Olena Bormashenko, Ralph Furmaniak, and Michael A. Lipnowski
5	CALIFORNIA INSTITUTE OF TECHNOLOGY	Po-Ru Loh, Mehmet B. Yenmez, and Rumen I. Zarev

The first place team receives an award of \$25,000 and each member of the team receives \$1,000. The awards for second place are \$20,000 and \$800; for third place \$15,000 and \$600; for fourth place \$10,000 and \$400; and for fifth place \$5,000 and \$200.

In each of the following categories, the listing is in alphabetical order.

THE PUTNAM FELLOWS—THE FIVE HIGHEST RANKING INDIVIDUALS

Each receives an award of \$2,500.

REID W. BARTON	Massachusetts Institute of Technology
VLADIMIR V. BARZOV	Massachusetts Institute of Technology
ANA CARAIANI	Princeton University
DANIEL M. KANE	Massachusetts Institute of Technology
AARON C. PIXTON	Princeton University

THE NEXT TEN HIGHEST RANKING INDIVIDUALS

Each receives an award of \$1,000.

TIMOTHY G. ABBOTT	Massachusetts Institute of Technology
ROBERT M. BARRINGTON LEIGH	University of Toronto
OLENA BORMASHENKO	University of Waterloo
DORIAN CROITORU	University of Pittsburgh
IAN T. LE	Harvard University
SHAOWEI LIN	Stanford University
ALISON B. MILLER	Harvard University
ANDREI NEGUT	Princeton University
JACOB TSIMERMAN	University of Toronto
INNA I. ZAKHAREVICH	Harvard University

THE NEXT ELEVEN HIGHEST RANKING INDIVIDUALS

Each receives an award of \$250.

NIKIFOR C. BLIZNASHKI	Duke University
STEVEN J. BYRNES	Harvard University
DAVID W. COLEY	University of Chicago
OLEG I. GOLBERG	Massachusetts Institute of Technology
DANIEL R. GULOTTA	Massachusetts Institute of Technology
SERIN HONG	Stanford University
XIANNAN LI	University of Waterloo
TIANKAI LIU	Harvard University
MIHAI MANEA	Princeton University
ZHONGTAO WU	Massachusetts Institute of Technology
TONG ZHANG	Harvard University

HONORABLE MENTION—TEAMS

BUCKNELL UNIVERSITY
UNIVERSITY OF CALIFORNIA, BERKELEY
HARVARD UNIVERSITY
STANFORD UNIVERSITY
UNIVERSITY OF TORONTO

Hoang Minh Le, Toan Vu Phan, and Robert C. Rhoades
Boris Bukh, Xia Hua, and Vedran Sohinger
Andrei Jorza, Ian Le, and Ricky I. Liu
Robert D. Hough, Youngjun Jang, and Shaowei Lin
Robert Barrington Leigh, Roger Mong, and Jacob Tsimmerman

HONORABLE MENTION—INDIVIDUALS

BORIS ALEXEEV, Massachusetts Institute of Technology
JEFFREY M. AMOS, Kansas State University
DANIEL S. BROX, University of British Columbia
MATTHEW B. BURKEMPER, Kansas State University
PO-NING CHEN, Massachusetts Institute of Technology
MICHAEL O. CHURCH, Carleton College
FERNANDO A. DELGADO, University of Michigan, Ann Arbor
ANAND R. DEOPURKAR, Massachusetts Institute of Technology
ADAM V. DONOVAN, Massachusetts Institute of Technology
ALEXANDER R. FINK, University of Calgary
CORY FLETCHER, University of Waterloo
RALPH FURMANIAK, University of Waterloo
YULIYA GORLINA, California Institute of Technology
MICHAEL A. HAMBURG, Harvard University
TIANYI DAVID HAN, University of Toronto
ROBERT D. HOUGH, Stanford University
SUEHYUN KWON, Princeton University
HOANG MINH LE, Bucknell University
JOEL B. LEWIS, Harvard University
MICHAEL A. LIPNOWSKI, University of Waterloo
MARK I. LIPSON, Harvard University
RICKY I. LIU, Harvard University
PO-RU LOH, California Institute of Technology
ANDREW M. LUTOMIRSKI, Stanford University

KAROLA MESZAROS, Massachusetts Institute of Technology
OAZ NIR, Duke University
NIZAMEDDIN H. ORDULU, Massachusetts Institute of Technology
VIRGIL C. PETREA, Massachusetts Institute of Technology
JONATHAN PINYAN, Washington University, St. Louis
ANATOLY PREYGEL, Harvard University
GREGORY N. PRICE, Harvard University
FLORIN RATIU, Stanford University
SHUBHANGI SARAF, Massachusetts Institute of Technology
STEVEN W. SIVEK, Massachusetts Institute of Technology
KALOYAN S. SLAVOV, Harvard University
EMANUEL IOAN STOICA, Massachusetts Institute of Technology
SAWYER J. TABONY, University of Chicago
KWOKFUNG TANG, University of Chicago
JEREMIAH J. TAUZER, University of California, Berkeley
MATTHEW J. THIBAUT, Massachusetts Institute of Technology
ILIYA T. TSEKOV, Massachusetts Institute of Technology
WEI-LUNG D. TSENG, University of British Columbia
DAVID W. VINCENT, Massachusetts Institute of Technology
MEHMET B. YENMEZ, California Institute of Technology
PAUL ZAGIEBOYLO, Carnegie Mellon University
RUMEN I. ZAREV, California Institute of Technology
JINGJIN ZHANG, Tufts University
LINGREN ZHANG, Duke University

ELIZABETH LOWELL PUTNAM PRIZE

Winner receives an award of \$1,000.

ANA CARAIANI

Princeton University

QUESTIONS COMMITTEE

Byron L. Walden (chair), Santa Clara University; Hugh Montgomery, University of Michigan, Ann Arbor; and Steven Tschanz, Vanderbilt University.

A total of 3733 students from 515 colleges and universities in Canada and the United States participated in the Competition. There were teams from 411 institutions. More complete details will appear in the *American Mathematical Monthly*.

March 7, 2005

Leonard F. Klosinski, Director; Gerald L. Alexanderson and Loren C. Larson, Associate Directors

THE WILLIAM LOWELL PUTNAM MATHEMATICAL COMPETITION

March 7, 2005

Dear Colleague:

Enclosed is a report on your contestants in the 65th Competition and your team rank (if it was in the range 1—150), a list of the top 500 contestants (which you may wish to share with your committee on graduate students), an announcement of winners, and a list of participating schools. Some tables are given below. Your contributions to the Competition are greatly appreciated.

Leonard F. Klosinski, Director
 Gerald L. Alexanderson, Associate Director
 Loren C. Larson, Associate Director

Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
109	1	70	23	51	84.5	39.6	186	29	371	13	778.5
101	2	69	27.5	50	89.5	39.5	187.5	28	405.5	12	825.5
99	3	68	31	49	100	39.4	189.5	27	426.5	11	916.5
89	4.5	67	34.5	48	110.5	39.3	192.5	26	432.5	10	1123.5
88	6	66	38	47	118	39.2	195.5	24	436.5	9	1305.5
87	7.5	63	41.5	46	122	39	208.5	23	445	8	1376.5
84	9	62	43	45	124	38	228.5	22	467	5	1419
80	10	61	47.5	44	126.5	37	241	21	508.5	4	1422.5
79	11	60	53	43	130	36	247	20	596.5	3	1439.5
78	12	59	58.5	42	134	35	249.5	19	686	2	1515
77	13.5	58	64.5	41	142.5	34	252.5	18	733.5	1	1655
76	15	57	69	40	159.5	33	258	17	754	0	2733.5
73	16	56	73	39.9	174.5	32	267	16	756		
72	17	53	75.5	39.8	181.5	31	287	15	759		
71	18.5	52	80	39.7	184.5	30	327.5	14	764.5		

FREQUENCY DISTRIBUTION OF PROBLEM SCORES OF THE TOP 196 CONTESTANTS

	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	Total
10	139	64	148	23	14	7	156	56	79	92	16	4	798
9	3	10	13	6	0	3	3	41	10	42	3	1	135
8	26	11	4	8	2	4	2	39	1	10	1	0	108
7	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
2	7	7	2	15	0	1	2	22	3	8	3	1	71
1	0	1	9	13	0	0	3	0	44	9	12	1	92
0	20	83	8	69	55	49	27	28	35	19	62	58	513
blank	1	20	12	62	125	132	3	10	24	16	99	131	635