

PRIME BITS

News from the Department of Mathematics - University of Colorado, Boulder
Boulder, Colorado 80309-0426 U.S.A.

October 1987

Volume I Number 1

About the name **PRIME BITS**. **PRIME** numbers play an important role in pure mathematics (e.g. number theory). A **BIT** is a binary digit (0 or 1) used in digital computer arithmetic that plays an important role in applied mathematics (and sometimes also pure mathematics). We hope that this name will call attention to the symbiotic relationship between pure and applied mathematics.

The purpose of **PRIME BITS** is to bring you information about all activities of the Mathematics Department. We welcome news from faculty, staff, students (graduate and undergraduate) and alumni. Please turn in news items to Jane Torgerson by the 20th of the month for the following month's issue.

Meet and Greet Our Visitors

Olav Njåstad is visiting the Mathematics Department during 1987-88 from the University of Trondheim, Norway where he is a Professor of Mathematics. He is not teaching a regular course, but is giving lectures from time to time at the Rational Approximation Seminar that meets on Thursdays 2:00-4:00 p.m. in CR 0-16. His primary areas of interest are classical analysis, functional analysis and general topology. This is his third year at C.U.; the first was 1973-74 and the second 1980-81. Olav and his wife Laila are living this year in University housing on Athens St. In her spare time here, Laila is taking a Spanish course at C.U. In Trondheim she works as a pharmacist. Their three children are attending universities in Norway. Their oldest, Oddvar, has become well known in Norway following the Chernobyl accident last year, since he is an expert on the detection of heavy metal concentration from pollution in beetles.

Hugh Maynard received his Ph.D. from C.U. in 1970. He is visiting from the University of Texas at San Antonio. His areas of mathematical interests include the geometry of Banach spaces and computer graphics. He is presently working on a book in computer graphics. Hugh still holds the frisbee golf record (the long course) for the Engineering Center. The record is 65.

Dening Li is visiting the United States from China where he is an associate professor in the Department of Mathematics and Mechanics at the Nanjing Institute of

Technology. His wife, who also teaches mathematics at the Nanjing Institute of Technology, and 3½ year old daughter remain in China.

In his last year of high school, the Cultural Revolution began. During this period, he was sent to the countryside, where he taught himself undergraduate-level mathematics. In 1978 after the revolution, he was among the first fifteen graduate students selected to begin graduate study at Fudan University in Shanghai which has one of the two best mathematics departments in China. He received his Ph.D. in 1985 in the area of partial differential equations. His current areas of interest are 1) boundary value problems of linear or nonlinear hyperbolic and parabolic systems, 2) pseudo-differential operators and their applications, and 3) scattering theory for wave equations--its application to image reconstruction and computed tomography.

He is interested in learning English, French, Russian, German, and Japanese; also in travel, playing bridge, and stamp collecting.

Stevó Todorčević This semester's Ulam visitor is Stevo Todorčević. He is on loan to us from the Mathematics Institute of Belgrade. The focus of the first part of his lecture series is the measure problem (an example of a question under this heading is: if C is a closed subset of R^n , then is every set, which can be obtained from C by finitely many applications of complementation and projection onto coordinate hyperplanes, Lebesgue measurable?) Stevo is giving a simplified account of the recent solution of this problem.

Welcome! To Our New Graduate Students

Arlan Ramsay and Betty Jo Thorson (Graduate Secretary) informed us that there are now 97 graduate students (head count, not FTE) in our graduate program. The 27 new ones are listed below. Future issues of *Prime Bits* will tell more about these and other graduate students in our department.

Boudjema Achab is from Algeria and is working on a Masters degree. His diploma of Higher Studies (DES) in 1986 is from University des sciences et la Technologie, Algeria.

Behzad Alezadeh-Rad's permanent address is Louisville, KY. He is working on a M.S. degree. He went to high school in Iran and Geneva, Switzerland. His B.S. degree is from UCB in 1986. He is a TA for our department, fall 1987.

Fathi Allan is from Jordan. He is working on a Ph.D. degree. He received his BSC from Birzeit Univ. in 1978 and a MSC from the University of Missouri in 1982.

Joyce Armstrong was born in Illinois. She is working on a Ph.D. degree. She received a BA/BS from The Evergreen State College in 1982.

Mary Jo Brodzik was born in New York state. She is working on her Ph.D. degree. She received her BA from Fordham University in Bronx, NY in 1987. She is a TA for the department 1987-88.

Manish Chakrabarti is from India. He is working on a Ph.D. degree. He received a M.Sc. in Computer Sciences from Birla Inst. of Technology and Science Pilani, India in 1985 and a M.S. in Math from Purdue University in 1987. He has a Fellowship and is a TA in our department for 1987-88.

Cynthia Connors was born in New Jersey. She is working on a M.S. degree. She has a B.S. degree from Albright College, Reading, Pennsylvania. She has a Fellowship and is a TA in our department for 1987-88.

Lee Cox was born in Maryland. She is working on an M.S. degree. In 1982 she received an A.B. degree from Middlebury College.

James Flanders was born in Nevada. He is working on a M.S. degree. He received a B.A. from St. Olaf College in 1987.

Scott Goette was born in Missouri. He is working on a M.A. degree. He attended University of Missouri and Columbia College.

Scott Herod was born in North Carolina. He is working on a Ph.D. degree. He received a B.S. in 1984 and a M.S. in 1986 from Georgia Tech. He will be a TA in our department for 1987-88.

Seong-Eun Kang is from Korea. He is working on a Masters degree. He received a B.A. from UCB in 1987.

Brian Kauffman was born in Wisconsin. He is working on a Ph.D. degree. He received a B.S. degree from the

University of Wisconsin in 1987. He has a Fellowship and is a TA in our department for 1987-88.

Linda Kilpatrick was born in Michigan. She is working on a Ph.D. degree. She received a B.S. degree from Texas A&M University in 1983 and a M.S. degree from UCB in 1987 (Ch.Engr.). She is a TA for our department this fall.

Thomas O'Connell was born in New York. Tom is working on a Ph.D. degree. He has a B.S. degree from Marist College, Poughkeepsie, NY. He will be a TA in our department for 1987-88.

Hussain Ojan is from Saudi Arabia. He is working on a Ph.D. degree. He received a B.S. degree from the University of Petroleum and Minerals, Saudi Arabia in 1979 and M.A. from Western Michigan University in 1983.

Roger Roberts was born in Ohio. He is working on a M.A. degree. He received a B.S. degree at Ohio University in 1974 and a C.C.E.S. from Johns Hopkins University in 1981.

Ana Sanabria is from Columbia. She is working on a Ph.D. degree. She received a Title in Math from Universidad Nacional, Columbia in 1979 and a Magister in Math. from the Universidad del Valle Ciudad Melendez in 1984. She will be a TA in our department this fall.

Bradley Sather was born in Minnesota. He is working on a M.S. degree. He has been attending the University of Colorado.

Chang Eon Shin is from Korea. He is working on a Ph.D. degree. He received a Bachelors degree from Sogang University, Korea in 1984 and a Masters from Sogan Graduate School in 1986.

Amy Solomon was born in Pennsylvania. She is working on a M.S. degree. She received a B.A. degree from the University of California at Berkeley in 1982. She attended the University of Wisconsin and will be a TA in our department for 1987-88.

James Swenson was born in Wisconsin. He is working on a Ph.D. degree. He received a B.S. degree from the University of Wisconsin, Platteville, Wisconsin in 1987. He will be a TA in our department for 1987-88.

John Verzani was born in Washington. He is working on a Ph.D. degree. He received a B.A. degree from Whitman College in 1986. He will be a TA in our department for 1987-88.

Andreas Weber is from W. Germany. He is working on a M.A. degree. He received a Vordiplom from Eberhard-Karls University in 1984.

Heather Weeden was born in Wisconsin. She is working on a M.S. degree. She received a B.S. degree from the Pennsylvania State University in 1985.

Anita Widjaja was born in Indonesia. She is working on a Masters degree. She received a BSC degree from the University of Pittsburgh in 1985. She attended UCB Fall 1986- Spring 1987.

John Zalewski was born in Wisconsin. He is working on a Ph.D. degree. He received a B.A. degree from Lawrence University, Appleton, Wisconsin in 1987. He is a TA in our department for 1987-88.

Notes from the Undergraduate Program

During the summer, negotiations with the Dean of Arts and Science and Engineering enabled us to hire five additional TA's to assist with AM135.

During the 1987-88 academic year, among the items we intend to consider are:

- 1) Module self-instruction for Math 101, 102, 110
- 2) Requiring Math 272 for Mathematics majors
- 3) Requiring two semesters of linear algebra for Mathematics Majors
- 4) Requiring advanced calculus for Mathematics Majors
- 5) Combining the Math 130 and AMath 135 courses.

Putnam Exam this year will take place Saturday, December 5. Please encourage undergraduate students with outstanding ability to sign up with Professor Brown by October 8, 1987.

What has the faculty been doing?

Walter Taylor's book, entitled *Algebras, Lattices and Varieties*, written jointly with George McNulty of South Carolina and Ralph McKenzie of Berkeley (CU Ph.D. 1966), was published by Wadsworth and Brooks-Cole in May. That was Volume 1; they are still working on Volume 2.

Professor James Curry has been invited to serve as a member of the Panel for Applied Mathematics, one of

the activities of the Board on Assessment of NBS Programs. His three year term began July 1, 1987 and ends June 30, 1990.

The Panel evaluates the technical work of the Center for Applied Mathematics, a part of the National Engineering Laboratory.

The National Research council has provided an annual evaluation of the technical functions and operations of the National Bureau of Standards since 1959. The Panels consider the importance and relative priority of projects, quality of staff, equipment needs, finances, and the relation of the program to the mission of the Bureau.

Bob Richtmyer retired from the Mathematics Department at C.U. several years ago and has been very active since then organizing and teaching in an Honors Mathematics Program. Bob retired from this program last summer, but has decided to begin teaching again this fall because there are so many students (29) in A.Math 237. Bob, we welcome you back with open arms.

On The Road and In The Sky

Gordon Brown attended a workshop on prime characteristic Lie algebras August 22-25 at the University of Wisconsin-Madison, where he was co-leader of a discussion on Lie algebras of low characteristic.

Rob Tubbs traveled to Ulm, West Germany to attend the Journées Arithmétiques conference (Sept. 12th-19th)-gave a talk at conference entitled "The algebraic independence of two numbers". July 5-18 Rob attended and lectured at the Conférence internationale de théorie des nombres in Québec, Canada.

Professor John Maybee's winter address is 1620 Decatur St. N.W., Washington, DC 20011.

Professor H. Hermes's winter address is Mathematical Sciences Research Institute, Berkeley, California. He will be there until December, 1987.

About the first of June, Professor Taylor attended an IEEE meeting in Boston, at which he gave a paper. "It was the first time I had been in Boston since my Ph.D. defense in 1968. I am glad I moved to Colorado."

Professor Taylor spent the first ten days of July at the Asilomar conference ground in Pacific Grove, California. There he spent three days conferring with the co-authors of his book and then a week at a conference on universal algebra, lattice theory and algebraic logic.

From Professor Ramsay, "I had a fine time in Australia visiting the Centre for Mathematical Analysis' at the Australian National University in Canberra. There were two conferences and a large group of visitors from around the world. I was able to make a side trip to visit a few days at the University of New South Wales as well as holiday trips to Perth and Alice Springs, climbing Ayers Rock."

Bill Jones attended the following meetings this year so far: January 1987 AMS at San Antonio (short course on moment theory and special session on orthogonal polynomials), April 1987 at the University of Antwerp, Belgium (nonlinear Methods and Rational Approximation), June 1987 Phoenix (Mathematical Theory of Networks and Systems), and August 1987 at Oberwolfach, F.R.G. (Constructive Methods in Complex Analysis). He gave invited talks at all but the San Antonio meeting.

Wolf Thron returned to Boulder in August from a 9-month stay at the University of Trondheim, Norway. Ann Thron worked as a medical doctor while Wolf was doing mathematics at the University. They had previously spent two full years in Trondheim which has become sort of a second home for them. As some of you may know, Wolf was elected to the Royal Norwegian Academy of Science a few years ago. He attended and gave invited talks at mathematics meetings in Antwerp, Belgium in April 1987 and at Oberwolfach in August 1987. Wolf retired from C.U. in May 1985, but it is a little bit hard to tell.

Notes from the Graduate Students

On Wednesday September 16 the graduate students held an informal informational meeting during the Slow Pitch Colloquium hour. Due to the new prelim structure and revised tax codes it was felt by many that there was an inordinant amount of confusion around that might be cleared up in general discussion. In addition to these topics we introduced Andy Bardwell and Roland Christofferson as the new Graduate Representative. And discussed: establishing a library of prelim solutions; sending a representative to the GSAC; study groups in Logic and Math/Physics and how to start others; teaching awards; the CUOP Teaching option; faculty evaluation and social activities.

Perhaps some progress was made toward clearing the air. At any rate, it was agreed that we meet again in Nov. or Dec. primarily to update the tax information but also to discuss developing events. Any input for the meeting from students or faculty should be directed to my mail box. John Martin.

Honors Program

The Advisory Committee for the (Undergraduate) Honors Program has met twice so far this semester and expects to meet on some sort of regular basis at 4:00 p.m. on Thursdays. Anyone who wishes to may attend these meetings and/or give any input to any member of the committee.

To this point the Committee has: (1) gratefully endorsed Bob Richtmyer's offer to assist Marty Walter (who is teaching this year's undergraduate honors course) with advising, office hours and even possibly with some teaching. (2) decided that the objective of our Honors Program should be to prepare students to take graduate courses in mathematics after two years in our honors courses. (They all enter with one year of AP credit in beginning calculus.) (3) discussed ways in which the department might encourage more rapport (even camaraderie) among our undergraduate mathematics majors. As a means of building interest in our major and of promoting interactions between students and faculty, it's been suggested that we (re)organize an Undergraduate Math Club using any interested students from AM237 as well as others as a core group. The possibility of doing this is being considered.

SEMINARS:

Harmonic Analysis

Kathy Merrill

Equivalence of Cocycles Under
an Irrational Rotation

October 6, 1987

Place and time to be announced

Rational Approximation

Thursdays 2:00-4:00 p.m.

ECCR 0-16

Editor's Note: Please let Jane know about seminars (research or otherwise) that meet regularly or irregularly so that we can announce them here in PRIME BITS.