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Outstanding Student Awards

During "end of year awards ceremonies" in May 1999, three mathematics students were honored for academic achievement during Academic Year 1998/99.

Gretchen Lee and **William ('Bill') McKee** were named the *Outstanding Undergraduate Students in Mathematics.*

Brian McBee was named the *Outstanding Graduate Student in Mathematics.*

Congratulations to Gretchen, Bill, and Brian for jobs well done !!

Outstanding Instructor

The 1998/99 Outstanding Honorarium Instructor in Mathematics award was presented to Dr. Holly Zullo. Holly has taught courses for the UCCS Department of Mathematics for the past two years. In addition, Holly led the UCCS COMAP Modeling Contest teams to impressive finishes in the national competition last February (see article below). Holly and her husband Mark are the proud parents of Kira, born November 29, 1997. Congratulations for all these things, Holly!

Daly Earns Chancellor's Award

Professor James E. Daly was named the recipient of the 1999 campuswide Chancellor's Award. This award is given to the one UCCS faculty member per year who best exemplifies the qualities most admired in a faculty member, including the three areas of research, teaching, and service. In remarks made at the campuswide Awards Ceremony in May, UCCS Chancellor **Linda Bunnell Shade** commented on Jim's valuable contributions to the University (including his work on various campuswide budget and search committees, and his work as Associate Dean in EAS), and his impressive research and teaching accomplishments. The Chancellor's Award comes with a medallion as well as a $500 stipend. Jim's recognition comes just one year after Professor K.M. Rangaswamy of the math department earned the 1998 Chancellor's award. We all congratulate Jim on this richly deserved recognition !!

Stephens Earns Employee of the Month Award

Joanie Stephens, the secretary and all–round support person for the mathematics department, was named CU–Colorado Springs Employee of the Month for August 1999. The new award, initiated by All-Staff Council and the Professional Exempt Staff Association (on-campus employee organizations), cites outstanding job performance and community and/or university service. Employed at the University since 1983, secretary of the math department since 1996, and an active member of the UCCS Financial Aid Committee for the past three years, Joanie was delighted to receive the recognition. "I'm lucky to work in the Math Department – the people here are wonderful. Everyone's effort counts," she said. We all appreciate Joanie's efforts, and are glad that she has received this important campuswide honor.

Notes From the Squeaky Chair

Jeremy Haefner
Chair, Department of Mathematics

There is probably no better time for a Department Chair to boast, cajole and leverage than within a Department Newsletter so I shall not let this opportunity pass. This has been an interesting year for the Department and this (albeit green) Chair as we've seen many exciting changes.

To begin, there have been a number of personnel changes to record. With sadness to the Department, long-time instructor **Nancy Baggs** chose last year to retire after 33 years of exemplary teaching and service. Students and faculty will (and already do) greatly miss Nancy but we are fortunate to see her from time to time as she still attends Departmental colloquia.

On a more positive note, **Sarbarish Chakravarty** has joined the faculty this year. He assumes the position that was vacated when Laurel Rogers retired. Professor Chakravarty specializes in applied mathematics but has many different interests; we are happy and lucky to have him in our Department. If you are visiting the Department, please stop by his office and introduce yourself. For more information, please read the article about Sarby that appears later in this Newsletter.

We are fortunate to hire **Shannon Michaux** as a half-time instructor to partially fill Nancy Baggs' shoes. In addition to teaching courses for the Department, Shannon also acts as coordinator for our honoraria faculty. This is an extremely helpful service to the Department; for example, she has organized an orientation for new honoraria and meets with them on a regular basis to help with problems.

The Department underwent a regular seven–year **program review** in 1998-99 and the overall report was VERY favorable. The reviewers had many great things to say about the Department especially about our concern for quality teaching and our production of research. But the team also had some helpful constructive criticism and suggestions which we will be working on over the next several years. Some of these suggestions, such as integrating our honoraria into the department more effectively, have already been partially accomplished. The honoraria now have an office (EAS 281) within the Department area so that they can conveniently hold office hours and prepare for their courses. We have also installed a bulletin/photo board that contains the names, photos and phone numbers of all our instructors.

Other suggestions from the review team will take more time to implement. For example, we are making the **analysis of our graduate program** our highest priority this year. As a sneak preview, the Department is embarking on an ambitious effort to possibly redesign the program. We intend to more effectively market our program by offering up to four "tracks" of specialization. You can help us in this effort as we will be sending out a survey to gather data and solicit opinions about our possible redesign. Your response to this survey will highly influence our course of action so we appreciate your time and effort.

Professor Gene Abrams is leading a discussion that may lead to a creation of a **Senior Seminar**, which may act as a culminating educational experience for our mathematics majors. The possibilities of such a seminar are quite rich and faculty appear to be enthusiastic for this project. But such a project would also necessitate a **re-evaluation of our entire program for mathematics majors**. So Professor Jim Daly is looking into possible changes in our undergraduate mathematics offerings. By this time next year we could be looking at a substantially different set–up here in the Department.

Of course, I could go and list the fantastic contributions that the mathematics faculty have made over the year but I will leave that for them to boast. Suffice it to say that we wanted to minimize the mailing cost of these newsletters so space is valuable!

Let me finish by extending an invitation to you to help mold this Department. Your input is invaluable and appreciated. If you have any questions or comments, I hope you'll feel free to contact me. Electronic mail is the best (haefner@math.uccs.edu) but the phone works just as well (262.3311). Thanks to all who supported us last year!

Around the Department

Greg Morrow is having 'serious fun' while experiencing "instant family" syndrome after marrying Marie Morrison and her two children MacKenzie (11) and Quinn (just turning 13) this past summer. These intrepid journeyers now have three cats and a new family member Jimmy (a Maltese puppy) who requires frequent walks and much loving attention. (Greg often attributes his recent internship in psychology as both a bane and helpful reminder of his inadequate coping techniques!) Greg moved to Denver not far from Mile High stadium to make his new life as a step dad. (He enjoys watching out for tow trucks and police handing out $150 parking

tickets for nearly all parking in sight on game days.) To help pay for the wedding, Greg consulted this year on a statistics design problem with Insurance Technologies of Colorado Springs.

In between his attendance at Star Trek conventions with his two sons Nick and Ramsey, **Jeremy Haefner** has participated in a number of triathlons throughout Colorado. These included strong finishes at the Cheyenne Mountain Triathlon, Glenwood Triathlon, and Louisville Triathlon. After this last race, **Keith Phillips and Sharon Hagan** hosted a departmental celebration gathering at their home in Boulder. Great fun was had by everyone who attended!

New Math Learning Center Director to be Named

Shannon Michaux has taken on new responsibilities and duties in the department of mathematics, and thereby will be giving up her directorship of the Mathematics Learning Center. A search for a new director is being conducted during Fall 1999. If you are interested in applying for this position, or know of someone who might, please contact Jeremy Haefner at haefner@math.uccs.edu. Shannon's shoes will be tough to fill!

Sabbatical Assignments

Gene Abrams finished a number of projects during his Spring 1999 sabbatical. These include completing some joint work with Visiting Assistant Professor Christopher Pappacena on tilting modules, completing an article ('Isomorphisms between infinite matrix rings: a survey', joint with Professor Juan Jacobo Simon Pinero of the University of Murcia, Spain), and visiting area high schools to make a presentation to sophomores and juniors titled 'Don't Wait!!'

Shirts and Hats

Just a reminder that the UCCS Department of Mathematics logo has been incorporated in handsome golf shirts and caps! (The logo appears in the masthead of this Newsletter). The shirts and caps are black; the logo is in the school colors (blue and gold). To order: Shirts are $18.98, Caps are $16.00. Caps are one-size-fits-all; specify shirt size S, M, L, or XL. Send a check (payable to *Embroidered Expressions*) to the above mailing address, attention Joanie Stephens.

Visitors

Professor Toshi Kitada of Hirosaki University (Japan) is visiting the department during Fall 1999.

He is working with Keith Phillips and Jim Daly on some research projects in various aspects of harmonic analysis. Jim, Keith, and the entire department are honored that Toshi chose to spend some of his sabbatical year at UCCS.

Travelers / Speakers

Keith Phillips presented a paper regarding some joint work with **Jim Daly** on *Sunuchi operators for Hardy spaces over Vilenkin groups* in Hungary this past August.

Yu Zhang visited Department of Mathematics at Kobe University (Japan) for two weeks in June. He then continued on to China, where he gave a talk in the international probability conference in Beijing.

Ken Rebman was invited to give a colloquium talk to the Optimization Seminar at CU - Denver. The talk, presented last fall, was titled 'The Mathematics of Apportionment.'

K.M. Rangaswamy was invited to give a main talk at the International Ring Theory Conference in July 1999 at Kyongju, South Korea. Ranga had the opportunity to see the OLD (2000-3000 years) relics of Korean Dynasties in that ancient city.

Rinaldo Schinazi used an NSF/CNPq collaborative grant to visit Brazil in June 1999. He gave two talks at the University of Sao Paulo, and then gave a talk at the IMPA in Rio de Janeiro. In July he went to Amsterdam for the Society of Mathematical Biology meeting, and subsequently to Paris where he worked with Ellen Saada.

Interaction with Teachers

The Mathematics Department was very much involved in the ongoing dialog with K-12 teachers throughout the Pikes Peak region. The course Math 4/510 *Technology in Mathematics Teaching and Curriculum* was taught during Summer 1999 by **Jeremy Haefner**. Students completed projects which they could utilize in their own classrooms. **Gene Abrams** continued to give presentations about the nature of mathematics to high school students throughout the area. Most of these were presented in February, around the time students are asked to decide what math courses they will take the following academic year. The title of the presentation was "Don't Wait!". The idea was to encourage students (by presenting some factual data) to re-enroll in math courses during their junior and senior years in high school. **Gene Abrams** and **Jeremy Haefner** made a 45–minute presentation at the Annual Meeting of the Colorado Council of Teachers of Mathematics, held in Denver on October 15, 1999. This meeting attracts math teachers at all levels (K-12, community college, university) from

throughout the state. The title of the presentation was "Don't Wait! Why Wait?". In it they discussed the "Don't Wait" talks described above, and the UCCS High School MathOnline program (see article below).

Congratulations to All 1998/99 Graduates!

Here is the list of the 1998/99 graduates from each of the department's degree programs. An impressive list, to be sure!

B. A. Mathematics:
Loren Barnes
Sarah Beaudin (recent mother of twins!)
Natalie Brown
Casey Geist
Alison McAffrey
Stewart Suhr
B.S. Applied Mathematics:
Seena Kim (student in MS Computer Science)
Gretchen Lee
William McKee
Sandra Shappell (in AL, will move to DC next year)
Barbara Sieving
M.S. Applied Mathematics:
Brian McBee
Erika Faciana (teaching math at UCCS and PPCC)

COMAP Modeling Contest: A MAJOR SUCCESS !!

The Mathematical Competition in Modelling is an annual international contest in which teams of three students model, solve, and write up their solution to an open-ended applied math problem. The contest is unique in that it involves students working cooperatively on a problem throughout the course of an entire weekend (nights included!). The students' work culminates with a solution paper that is mailed in to the judges. Several hundred teams participate each year from schools around the world, and the best papers are recognized with publication in the UMAP Journal.

Last year two teams participated in the COMAP Mathematical Contest in Modeling with great success! The two teams prepared for this competition with the help of Dr. **Holly Zullo**. (Holly has had much experience with COMAP. In fact, when she was a faculty member at Eastern Oregon University, she guided the team there to national prominence. In fact, the 1998 EOU team finished in a first place tie in the 1998 competition. The team EOU tied with? Harvard University!) The 89 hour contest was held in February and required analyzing one of two problems: PROBLEM A – What happens if a large meteor hits the South Pole? PROBLEM B – How should the maximum capacity of a room be determined so that the room can be evacuated efficiently in case of a fire? Both UCCS teams worked on Problem A. The team of Meredith Elrod, Shane Holloway, and Nick Sanford received a Meritorious rating, placing them in the top 17% world-wide and earning them an invitation to the Colorado Mathematics Awards at the Governor's Mansion. The team of James Horton, Bill McKee, and Pascal Stahel received a Successful Participant Rating. Congratulations to both teams!

The Math Department is looking for students to participate in the COMAP Contest for this academic year. The contest will be February 4–7, 2000. Each school can enter up to four teams in the traditional contest. If you are interested in participating in the COMAP MCM, please contact Dr. **Jon Epperson,** either by email epper@codenet.net, or by dropping a note at the math department office, or by calling him at home 488-0927.

Courses Delivered via the Internet

The Department of Mathematics continues to deliver a number of its standard courses in a format which allows for transmission via the Internet. The program is called MathOnline. Each of the courses is taught in a relatively traditional fashion (live instructor in a classroom, with students fully participating). The slight difference that in-class students experience the use of a graphics tablet to project the instructors' writing on a screen, rather than a standard chalkboard or whiteboard. All students can 'replay' the lectures at their convenience in order to review material or prepare for exams. In addition, students can print off hard copy of lecture notes. Traditional, in-class students indicate that they like this format. In addition, various students who would not otherwise be able to take the course (e.g. advanced high school students) are able to enroll and fully participate without coming to campus. The courses *Discrete Mathematics* (Math 215), *Linear Algebra* (Math 313), and *Introduction to Differential Equations* (Math 340) are being offered in both Fall 1999 and Spring 2000. For more information, email mathon@math.uccs.edu .

International Research Conference at UCCS

In June 1999, the Conference on Probability Models on (Exotic) Graphs was held at UCCS. This conference was organized by **Rinaldo Schinazi**, **Yu Zhang**, and **Greg Morrow**. The conference was sponsored by, among others, the UCCS Department

of Mathematics (which helps sponsor a research conference each summer in varying mathematical disciplines), and the National Science Foundation. The conference brought together a lively mix of older and younger mathematicians. From the younger set, many outstanding researchers, both women and men, were represented. This was quite satisfying to the conference organizers, since indeed a whole new generation of mathematicians has picked up a tradition of research on probability, with now a focus on graphs. Many conferees lodged in the dorms (including some of the organizers!). The three probabilists have now hosted three international conferences since 1990. The first was held on the Colorado College campus, in part because it had dorm rooms available. Thus for the probabilists, this conference was a breakthrough in that it was successfully hosted entirely on the UCCS campus.

Ranga Takes Charge …

Ranga has selflessly been filling many important administrative roles within the College of Engineering and Applied Science. First, he has been acting as Associate Dean for the College since Spring Semester 1999. Second, he has been the UCCS Site coordinator for CO-AMP (Colorado Alliance for Minority Participation); see the following article. Finally, he has been Acting Chair of the Mechanical and Aerospace Department.

CO-AMP

The Colorado Alliance for Minority Participation has a strong presence at UCCS. As part of this program, **K.M. Rangaswamy** received an NSF grant of $37,000 for 1999; with these monies he ran a summer 'bridge' program in August 1999 for incoming minority students in Engineering and Sciences. CO-AMP's primary goal is to double in five years the number of underrepresented minorities (African American, Hispanic and Native American) students receiving baccalaureate degrees in Science, Mathematics, Engineering, and Technology (SMET) in Colorado. It is supported by a 3 million dollar grant from the NSF for five years. Other CO-AMP goals include substantially increasing the quantity and quality of education for these students. The CO-AMP objectives include (i) Bridge Programs to facilitate a smooth transition for incoming freshmen and transfer students, (ii) Retention and Mentoring activities such as study skills workshops, tutoring, Supplemental Instruction and MESI, (iii) Undergraduate Research, and (iv) Recruitment.

The MESI Program

Greg Morrow and **K.M. Rangaswamy** head up the MESI program (Maximizing the Effect of Supplemental Instruction) for supporting success and retention of both minority (CO-AMP) and at-risk students. The Supplemental Instructors who were added to the Math Learning Center support system over the last few years will be further utilized for large group review sessions for all students of the 100-level mathematics courses during midterm and final exam periods. This will involve increased communication between the department and the instructors to provide even greater consistency in the way these courses are being taught. CO-AMP students undergo an intensive week of preparation at the beginning of the semester, including contact with many faculty and support personnel. The MESI students are being contacted by mail with comments provided by their individual instructors to offer insights and feedback for academic success. The diagnostic exams the department instituted a few years ago have provided a big drop in the percentage of failures and withdrawals for the 100-level courses overall. A goal of the MESI and CO-AMP programs is to provide avenues for improved success and retention of students in these courses.

Mathematics Monthly Puzzler

The Math Department is glad to continue its sponsorship of the Mathematics Monthly Puzzler contest. This contest is open to all currently–enrolled UCCS undergraduate students. Students of all mathematical ability levels and backgrounds are encouraged to try their hand at the Puzzler. Written solutions to the Puzzler should be deposited in the Puzzler Box in the Math Learning Center (EAS 129). A $20 Gift Certificate to the UCCS Bookstore is awarded to the student who submits the most creative, complete, and/or interesting solution. In addition, a special prize will be awarded to the student who submits the best overall solutions to all of the semester's Puzzlers. Check the website for the November 1999 Puzzler. Previous Puzzler questions, along with their solutions, can be found by visiting the department's web site http://mathweb.uccs.edu.

Newsletter Interview:
Dr. Sarbarish Chakravarty

The UCCS Math Department's newest faculty member is Sarbarish Chakravarty. We interviewed Sarbarish to find out something about his background, his initial impressions of UCCS, and how he is adjusting to Colorado Springs.

Q: Sarbarish, you just arrived here after spending quite a few years in the Applied Mathematics Department of CU Boulder, and several years in Sydney, Australia. What are your initial reactions to UCCS, and can you make any comparisons between the educational experience here and at our larger neighbor to the north?

Sarbarish: I immediately noticed the age difference in the student bodies. The students in Boulder are mostly traditional, so when I taught Calculus there the students were mostly eighteen years old and fresh from high school. At UCCS there are many older students. The atmosphere in the classroom and on campus seems more serious at the freshman level. I'm teaching a Calculus 1 class which meets T-Th-F from 5:50 to 7:05. Attendance has been good, even on Friday nights, when the students in Boulder are more likely to be at a party. The mathematics students at UCCS also have several advantages. Class sizes are quite a bit smaller. In Boulder a typical Calculus class would have 125-150 students. Also the fact that the Mathematics Department requires students to pass a calculus readiness exam means that students with weak preparation are identified and advised before the semester starts.

Q: Your background in applied mathematics is pretty extensive. Can you give us a sketch of your academic background.

Sarbarish: My Ph.D., from the University of Pittsburgh, is actually in Mathematical Physics. At that time I was studying modern geometric problems related to Einstein's Theory of General Relativity. I was interested in a class of nonlinear differential equations known as soliton equations, which also have applications to fluid flows and nonlinear optics. After graduate school I had the opportunity to work on this subject with Mark Ablowitz and A. Fokas at Clarkson University in northern New York. A year later, when Ablowitz became head of what is now the Department of Applied Mathematics in Boulder, I was able to accompany him. In 1995 I began working on applications of soliton equations to fiber optic communications. For very long distance communications, such as for trans-Pacific cables, the light pulses used for optic communications spread by a process called dispersion. This spreading can easily cause interference between neighboring pulses, leading to unacceptable performance. If one modifies the composition of the fiber, introducing the right type of nonlinear effect, the dispersion and nonlinearity tend to cancel, providing enhanced performance. However the introduction of nonlinear effects greatly complicates the phenomenon which can be observed. These phenomenon can have a direct connection to the performance of the communications channel, so they are very important from an engineering viewpoint, but their explanation also provides complex challenges for mathematicians and physicists.

Q: Tell us a little bit about yourself and your family.

Sarbarish: My family consists of a wife, Rhonda, who is currently a full–time mom, a daughter Ila (8yrs., 4th grade), a full–time Chipeta Elementary student and likes it, and a son, Raja (2yrs. 10 mo., no grade), who keeps mom VERY busy. My wife is originally from northern New York and both my kids were born in Boulder, Colorado. We all like the Colorado weather and mountains a lot.

I enjoy hiking, reading, and hot food (both cooking and eating). As a family we also like to travel. Besides visiting several places in the U.S., India (my parents live there), Japan, Thailand, we lived in Sydney, Australia, for almost three years (1995-98). That was an interesting experience for all of us, but especially for my daughter who started her first school in Sydney. At school she learned and spoke Australian English then at home she switched to American English. She thought that was cool!