



Colorado School of Mines

Newsletter

Petroleum Engineering

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Greetings from Craig W. Van Kirk

It is my pleasure to share with you the activities of CSM's Petroleum Engineering Department during the last 12 months. Also, here's a brief update on my personal family status. On a positive note, my wife Denice and I enjoyed the birth of our fifth grandchild, Sean William Campbell, on October 8, 2002. He is healthy and happy, as is our son-in-law USMC Captain Tom Campbell, who returned home safely to the US after having spent 6 months recently in Iraq with his brother Patrick. We are lucky and grateful.

Unfortunately, on a sad note, my little brother's wife Shari Van Kirk died of cancer this summer on June 20 after being diagnosed 2 years ago. She was only 55 years old. My wife Denice and I knew Shari for 40 years, as closely as our own sister.

Also, several CSM PE alumni passed away during the year, ranging in ages from 35 to 90. So, please enjoy life every day and be careful. Throughout the year I receive daily messages or personal visits from many PE alumni with inspirational and satisfying news. This frequent contact is most appreciated and welcome, please make a point to keep in touch with us.

Since our last Newsletter a year ago we have added one new faculty member, Dr. Larry Chorn. We are so pleased that Larry has joined our staff after 25 years in private industry in research, development, and operations with Arco, Mobil, et al. Larry moved into Alderson Hall in early August and started fresh this current Fall semester. His areas of specialization are economic evaluations, risk analysis, real options, and EOR. Naturally, he's teaching PE422 this semester. Read on and learn more about Larry later in this Newsletter.

During the past year our PE Department continued to enjoy success on all fronts. The job market for our graduates has been very strong. Our BS graduates enjoyed the highest average salaries of any department on campus, as always, exceeding \$60,000 per year. Also, our job placement rate by graduation time was tops on campus, nearly 100 percent. During these economic times in the country and the State of Colorado, we are pleased that PE's students and program are so popular and so well supported.

(continued on page 2)



Craig Van Kirk

Inside this issue:

Greetings from Craig Van Kirk	1
Faculty Letters	3
Field Trip Photos	10
Anchorage Alumni Picnic	11
Alumni Reception-SPE Conference	16



Please help us by completing and mailing the enclosed Alumni Survey.

As always, Dee Brown and Chris Cardwell continue to provide excellent support for the program, students, alumni, professors, and partners around the world. Dee has completed 20 years and Chris has completed 10 years as administrative assistants in PE. Both of these ladies are planning to retire within the next 12 months, against my pleadings. I suppose I'll be retiring too, someday.

Here's some new and exciting news:

1. The US Department of Energy has chosen CSM and Penn State to conduct a pilot project to find ways to increase the number of students graduating annually who are prepared to enter the energy industry. Our PE Department is a major player in this new program.

2. Gulf Publishing Company's Advisory Board has selected CSM's PE Program to receive the World Oil Award, to be presented at a banquet in Houston on October 16. Only 4 US PE programs have been so recognized for "excellence in petroleum engineering education".

3. Marathon Oil Company has started a Center for Reservoir Studies in our department with a grant of \$300,000 over 3 years. Read more about it later in this Newsletter.

4. Our computer labs which we provide our PE students appear to be top notch. Our students offered their opinions in a survey last school year that our computer labs are the best on campus; clean, reliable, up-to-date, always open, free software and paper; thanks to professor Mark Miller's dedicated hard work, and thanks to alumni and industry supporters who deliver the funds necessary to pay Mark's salary and cover the other significant costs not provided by CSM.

My own activities continue to include teaching seniors reservoir engineering in PE423, teaching freshpeople the introductory course in PE102, and working with grad students on a wide variety of reservoir management topics. I do enjoy it all so much.

In late September I'm scheduled to go to China with CSM President John Trefny as part of a small group to further CSM's part in training Chinese professionals in global oil and gas E & P business, technology, economics, et al. I plan to be back in the USA just in time for the Annual SPE Conference.

Then in late October I'll be in Egypt to conduct a "needs assessment" to help them improve the quality of their petroleum industry professionals through improved training. It is most satisfying to be able to help people from throughout the world improve their lot, and I really do enjoy the trips, visits, and making new friends for myself and for CSM. However, I don't like to miss classes very often, and these 2 trips in the same semester create an unusual situation which cannot be avoided. Not to worry though, I'll schedule tests on the class days I'll miss.

Please note that the Annual SPE Conference this year is in Denver, from Monday October 6 through Wednesday October 8. Naturally, we'll cancel all PE classes for those 3 days and encourage all of our students to attend the conference

as much as they can. And, as always, the Department will cover all of the students' costs using funds provided by CSM PE alumni and other supporters in industry. If you can make it, please try to attend our annual alumni reception on Tuesday evening October 7. As always, lots of students and alumni will be there making new friends and sharing news. If you need more info please phone Dee or Chris at (303) 273-3740.

Each year the PE Department enjoys donations from alumni and other industry friends totaling several hundred thousand dollars above and beyond the support provided by CSM's Administration. These donations have been and continue to be essential to our practice of providing our students with an exceptional and excellent educational experience. Most of the monies go to supplement the undergraduate program; such as, computer labs, SPE Conference expenses, 2 summer field sessions PE315 and PE316, fieldtrips, books, financial aid, guest speakers, Thanksgiving luncheon, et al.

Also, significant funds are spent on graduate students to support them as Teaching Assistants, with most of these activities going to support the undergraduate program by providing graders for all undergraduate classes and assistants to ensure safety in our undergraduate lab classes and summer field sessions. The PE program really does need your help in order to continue our exceptional activities, so please give serious consideration to supporting the Program in any way you can. If you need advice or have any questions, please contact me at your convenience.

Our PE Department continues to be strong and healthy, striving to maintain and build upon the longstanding fine reputation. The alumni accomplishments in the global petroleum industry continue to bring praise to CSM and a worldwide reputation of the highest caliber. We can all be proud to be associated with such an extraordinary group of people, young and old, in PE and across the CSM campus.

We continue to enjoy healthy class sizes, averaging approximately 30 seniors per year. Our undergraduate program is balanced very nicely with our graduate program, which maintains approximately 50 total Masters and PhD students each year. At all levels of our student body our global reputation attracts a healthy mixture of US citizens from throughout the country and international students from throughout the world. The PE Department annually attracts the highest percentage of non-Colorado resident students on campus and the highest absolute number of international students. Also, I believe the number of US citizens in our graduate program is the largest in the world.

The ultimate success of each of us, and our teammates, and our teams depends on mutual support. I thank you for your continuing support. Please keep in touch and come by for a visit whenever you can.

My best regards to you.
Craig

Letters from Our Faculty

Larry G. Chorn

It has been quite a while since I was the new kid on the block (nearly 15 years), so I find myself trying to learn all of the do's and don'ts of the department, ASAP. Twenty-five years of experiences at ARCO R&D and, most recently, with Mobil Research and Development have made me pretty pragmatic about change, so I ask people to bear with me. I'll get up to speed soon. Everyone is very understanding and generously avoids laughing at me when I ask silly questions.

I joined the department in August, 2003 as an Associate Professor with a focus on valuation of exploration and development opportunities, oil corporation finance and strategy, and technical interests in Reservoir Engineering and pipelines (more about those experiences later.) The faculty took pity on me this first semester and assigned me to instruct PEGN 422 (Economics and Evaluation of Oil and Gas Projects). It is a subject that I have a great deal of experience in, both through education and practical application. I will also be directing one or two special topics students on valuation related issues. One is an extension of one of my recent papers, SPE 82006, which documents a strong linkage between reserve replacement ratio, proven inventory value, and share price. I intend to begin my research funding search and project proposal effort by mid-term. One of my near-term goals is to begin training (which means finding funding and then the students) masters-level students in the practical aspects of project valuation and reserve estimation and management.

By now you are probably wondering about my industry background and my pathway to Mines. So here is the biography, in a nutshell.

I received all of my technical degrees (B.S. through Ph.D.) in Chemical Engineering. I was extremely fortunate to train with Prof. Thomas Hanratty (National Academy of Engineering) for my Masters and Ph.D. at the University of Illinois-Urbana. When I completed my dissertation work I chose an offer from ARCO in Dallas to continue my dissertation work on drag-reduction, this time in the Trans-Alaska pipeline. The fruits of the project resulted in an increase in the pipeline capacity from 1.1 MM bbls per day to 1.6 MM without capital



*Larry Chorn
(The new guy)*

and for only \$3000 per day. Needless to say, it was a great first project! I continued with ARCO through 1987, working on arctic pipeline issues and later on reservoir engineering aspects of miscible displacement in Alaska and west Texas.

I accepted an offer to move to Mobil Research and Development Corporation, also in Dallas, and lead their miscible flooding R&D program. At the same time, I was enrolled in Southern Methodist University's part-time MBA program, focusing on finance and strategy. In early 1991, after finishing my MBA and completing some phase behavior work for Canadian miscible flood projects, I was asked to become the R&D Planning manager for Mobil's upstream organization. It was a great experience that gave me many industry contacts and a broad view of the industry's technology needs and adoption rate, insights that I use on a regular basis.

I completed my assignment as Planning manager and was assigned to perform a reserves/resources portfolio evaluation in the Reserves Management group. Ultimately that responsibility expanded into managing Mobil's long-range model for capital budgets and reserve replacement in exploration, field development and production operations. As part of that responsibility, I supported the Vice President of Exploration in defining and quantifying the bottom-line impact of his exploration budget. In this role, I discovered and learned the use of Real Options for valuing long-lived, highly uncertain investment opportunities.

As the merger between Exxon and Mobil unfolded, I moved to the teaching and consulting profession. I was the Mobil Visiting Professor of Finance at the American Graduate School of International Management (Thunderbird) and, more recently, an adjunct professor of Finance at the University of Texas in Dallas. Between lectures, I had the opportunity to consult on economic issues on four continents with more than twenty oil and gas companies. It has been very engaging work and allowed me to expand my view of the economic and reserve management practices in place throughout the world. I have already begun incorporating simplified versions of my experiences into my PE 422 lectures.

Many of you may know of me through my presentations and publications on the application of Real Options to our challenging business. I have been active in SPE meetings and the Forum series for several years. I intend to sustain that involvement and perhaps increase it as time and opportunities make themselves evident.

CSM and the Petroleum Engineering Department have entrusted me with the important responsibility of teaching the next generation of our industry. I take this responsibility very seriously. If you have questions, comments, or would just like to visit, please feel free to contact me at (303)273-3903 or by email at lchorn@mines.edu. I look forward to meeting many of you over the next year.

Richard L. Christiansen

In preparation for writing this letter, I skimmed last year's letter; it was pretty darn good. And most of it would apply this year: the start of the semester is always a bummer, it's fun to have the youthful faces of students around, I keep busy with research, and so on.

One new twist: I was elected a member of the Faculty Senate last Spring.

The Faculty Senate is composed of about 15 faculty from many of the departments on campus. The Senate is a voice for the Faculty, which means that it has little real power. I hope that membership in the Senate will provide a route for influencing directions at Mines. With the economic downturn in Colorado and the resultant strain on our budget, this is a time of campus soul-searching: What should we do differently to avoid such budgetary difficulties in the future? It will take some time for the campus to find an answer to this question. I expect that the answer will include increasing enrollment without increasing the number of faculty, so larger classes will result. The answer also will include recruiting of non-resident students who will pay a higher tuition. And I hope that the answer will include re-focusing the campus policies on research so that we can produce competitively priced proposals, which should attract extra revenue.

For those of you who missed last fall's newsletter, I will briefly replay some of the "highlights." Once again, I am teaching PE 310 (with 33 students) on the properties of oil, gas, and water. This course includes instruction in the wet labs and in the computer lab. At the graduate level, I am teaching Enhanced Oil Recovery. Twelve students are enrolled, including two undergrads.

On the research side, I am developing "Mr. Misty", that is what Robert Thompson called it. This technology converts water at the bottom of a gas well into a very fine mist for lifting by the flowing gas. A device for shallow gas wells should be available this semester. I am looking for funding to develop the device for deeper wells. This technology has attracted a lot of interest. The research is funded by the DOE through the Stripper Well Consortium at Penn State. Another part of my research time is devoted to coal-bed methane, particularly the permeability of coals for different gas compositions (methane, nitrogen, and carbon dioxide). This work is sponsored by the Idaho National Engineering and Environmental Laboratory.

And just as last year, total sales slowly increase for my text on multi-phase flow for reservoir engineering. A recent discussion of rel perms by SPE's Reservoir Simulation TIG prompted a higher rate of purchase, still, it is not a best-seller!



Richard Christiansen

The text is available through the CSM bookstore.

The coming year is my 14th at CSM. The years have passed quickly. During this time, there have been many changes in the faculty and many more in the students. On the wall of my office hangs a picture of a group of students from the 1996 summer field session in Canada. I enjoy reflecting on those experiences and many others with students. I hope that all of you are finding satisfaction in your careers. And I hope that the oil and gas industry will continue to test the limits of your abilities.

Alfred W. (Bill) Eustes

Another year, another newsletter. Where does the time go? This last year has whooshed by (like the Enterprise at the start of Star Trek). Between the classes, my research activities, and the various service activities, it beats me when I sleep. Come to think of it, maybe that explains a thing or two. In any event, I would like to tell you about the drilling education business at Mines.

Drilling Research Activities

As you probably know from previous newsletters, Dr. Will Fleckenstein and I have been involved in the development for the next generation of ice core rigs. We had the conclusion for the conceptual design at the Ice Core Working Group meeting in March. It looks like a good plan. Now it is a matter of putting the funding in place.

By the way, Will and I have an alternate paper at the 2003 SPE ATCE titled: Novel Wireline Coring System. It is a review of ice coring operations and how the equipment might be used in petroleum operations to reduce the cost of recovering cores.

The Martian drilling research program at CSM is still in progress. We finished the minimum mass flow rate tests. Unfortunately, the bits kept breaking on us. Given the novelty of this bit, this was disappointing, but not unexpected. JPL is redesigning the bit with industrial assistance. Our latest JPL contract is to develop an expert system for autonomous robotic operations. I have always felt that great drillers have a feel for drilling operations by listening to the system. We will try mimicking this by instrumenting the Mars bit with a microphone and listen to the bit while we do "bad" things to it. If we are right, then we should have some vibrational premonition of a potential catastrophe by listening to the sound. We shall see (hear?).

Service

Another facet of being a faculty member is service. In the last few years, I have been on the Executive Committee of the Petroleum Division of the ASME. This year, we have voted on becoming the second ASME Institute: the International Petroleum Technology Institute. It is interesting being in on the creation of a new, yet familiar, organization. Look for it soon.

I also had the pleasure of representing the Colorado School of Mines at the AADE conference in Houston in April. We were the first of ten schools invited to present our drilling

education and research activities. I was trying to determine why we were first. It wasn't alphabetical, nor was it the obvious answer that we are number one. I think it is because we led the AADE in creating the first AADE student chapter! Now there are four, CSM, LSU, ULL, and TAMU.

I am also the chair for the sixth SPE Colloquium on Petroleum Engineering Education. It was to be held here on the Mines campus last August. Unfortunately, the registration numbers indicated that we should postpone the CPEE, step back, and determine why the attendance was going to be low. Currently, we anticipate the CPEE will be held in June of next year.

Field Session

This was my seventh year of leading the PEGN 315 Summer Field Session. We went to Texas and Louisiana this year. Assisting me was Dr. Mark Miller as usual and Dr. Erdal Ozkan again. As my assistants, I had Dee and Joe Brown again. There were a total of 35 students this year, and we focused the session on offshore operations.

As we always do, we start the Field Session stressing safety. Transocean donated a video to the department many years ago called, "Remember Charlie". It is a talk by Charles Morecraft, a person who survived a brutal industrial accident. It always gives me pause when I hear his story. It also emphasizes safety from the "get go" with our sophomores.

We spent the first week of Field Session in Houston. I found it hard to believe; but everyone who lived down there assured me that the temperatures were moderate. In any event, over the weekdays, we visited the following companies:

Aramco Services Company - Khalid Al-Hanai, Norm Odell, Wayne Hollingsworth, Sally Johnson, Steve Sawyer, and Freddie Wong.

Oceaneering Intervention Engineering - Christopher Murdoch and Michael Cunningham.

FMC Energy Systems - Dane Tipton, Leigh Martin, Carey Seay, and Gavin Stafford.

I also want to thank Glenn Macdonald of Technip-Coflexip - CSO Aker Engineering who helped me arrange Oceaneering and FMC.

Anadarko Petroleum Corporation - Susan Howes, Jacob Shumway, Scott Albertson, Jay Blaylock, Mike Bridges, Scott Chesebro, Randy Couch, Mike Griffis, Tomas Gutierrez, Eric Kolstad, Eric Miller, Mark Pease, Justin Raithel, Cameron Rempel, Josh Walker, and Shawn Young. There are a lot of CSM Alumni in that list!

Hughes Christensen - Bobby Grimes and Sean Berzas.
Cameron - Thomas Kelly.

Schlumberger - Nathan Frisbee, Tyrone Chang,



Bill Eustes

Jonathan Cockeram, Javier Espinosa, Joel Alabastro, Nigel Lewis, Pat Sladecek, Dave Nichols, George Spencer, and Choon Wong

We ended up in Galveston for the weekend studying near-shore clastic depositional environments. We also visited the Ocean Energy Museum, which I thought was well done.

Sunday was an interesting day. Because of flight limitations, I had to split the Field Session into various groups for a tour of three deep-water drilling rigs. These tours originated out of Morgan City and New Orleans. So, talk about a logistics effort. In any event, on Monday we had ten people head out to ConocoPhillips' Deepwater Pathfinder, fourteen people head out to Unocal's Discoverer Spirit, both Transocean drillships, and sixteen people head over to Mississippi to tour Noble Drilling's - Therald Martin, a semi-submersible in Signal International's yard. There were a lot of people that made this happen.

Deepwater Pathfinder: Wayne Sanders, Marcel Robichaux, and Ward Theriot of ConocoPhillips, Daniel Haslam, Daun Winslow, and Capt. Fernando Gutierrez of Transocean.

Discoverer Spirit: Charles Burton, Eddie Doré, and Mike Sprawls of Unocal.

Noble Therald Martin: Kirk Atkinson – Noble Drilling, Chad Freeman and Ryan Schnoor, Signal International, and Leif Nelson, Transocean.

And for making it all happen, Dennis Heagney.

We spent the next day in Lafayette visiting:

Randy Smith Training Solutions - Gary Nance, Jeff Prilliman, and Randy Smith

Nabors Drilling USA - John Savage

I want to thank Michelle LeBlanc of ENSCO International for arranging this on short notice.

Wednesday, we got up early and set out for Intercoastal City. APEX Oil and Gas had invited us out to visit TODCO RBF 206 jackup and a production platform. We split into two groups that left three hours apart. The arrangements were orchestrated and timed beautifully. It was awesome. One thing that really got the student's attention was the personnel basket used to lift us up from the crew boat up to the platform and back. We really appreciate the efforts of many people:

APEx Oil and Gas - Mike Ardeel and Gary Patin

Sierra Engineering - Blake Patton (the arranger!)

The Offshore Drilling Company - Stephen Barber, Joshua Minton, Jason Scott, and Scooter Wise

Nova Consulting Services – Tracy Lowry

The last two days of the Field Session were spent on our way back to Houston. We stopped at Papco Oil and Gas in a wildlife refuge near the Sabine River. They also hosted a barbecue beach party! Then we finished up with Helmerich and Payne's yard touring the Flex Rig plant.

PAPCO Oil and Gas - Darrell Pierce, Dan Pierce, and Steve Sharp

Helmerich and Payne International Drilling - J.T. Dohm, Ross Berg, Ed Bull, Todd Cantrell, Corey Lawyer, David Millwee, Dewayne Speer, and Mauricio Cuervo

This field session saw no injuries of any kind, as usual. That is because we stress safety, safety, and safety! We were also on time except once when I couldn't find the national wildlife refuge (you wouldn't think it would be that tough). The students were on time every time, a record for Field Session!

One of the things I like to do in these newsletters is to be certain to list everybody that helped make these field sessions the successes that they are. However, in the hustle and bustle of the session, I sometimes don't get everyone's name that helped us. I apologize if I have misidentified or even left you out of our thanks. If I have inadvertently left you off, please let me know.

I hope to see you at the Denver ATCE!

John R. Fanchi

A new Petroleum Engineering Handbook is being written under the auspices of SPE with Larry Lake (UT-Austin) as Chief Editor. It has been a daunting task to completely revise and update the Bradley edition. Fortunately, many people have volunteered to contribute their expertise. I have served as the editor of the General Engineering section and have received contributions



John Fanchi

from several colleagues at CSM and around the world. I expect the new PE Handbook, which should be published in 2004, to be a welcome addition to my bookshelf.

The Energy Engineering course I described last year was conducted for the first time during Spring 2003. The course presents an integrated overview of energy sources that will contribute to the energy mix of the 21st century. We had several guest speakers and covered a lot of ground. The course text is scheduled for publication by Academic Press later this year or early in 2004. The working title is "Energy: Fundamentals of Technology and Directions for the Future." Send me an email (jfanchi@mines.edu) if you want me to let you know when the book is available.

On the research side, Phase II of the Consortium for Integrated Flow Modeling is generating additional insight into how to provide low-cost estimates of important geomechanical parameters. Our work includes a series of reports for Consortium members that contain details of the research. For example, one report describes a spreadsheet that can be used to quickly estimate the impact of geomechanical effects on well productivity. Another report describes a spreadsheet that shows how to calculate the pressure and saturation dependence of Young's modulus and Poisson's ratio. These geomechanical parameters play an important role in hydraulic fracture design and understanding formation stability. We

expect to learn more in the future by applying the methods to field cases. We are interested in well productivity problems that might be due to changes in geomechanical properties. If you have any cases that you would like us to consider, please let me know.

If you would like more information, visit my website at <http://www.mines.edu/~jfanchi/>.

Ramona M. Graves

When the students return from their summer jobs, it is so nice when they greet me from alumni I have taught. The disconcerting part is that the students all say that the conversation starts with "Is Ramona STILL there?" Yup, still here! Craig was just in my office showing me a Mines Magazine from 1982 that focused on Petroleum Engineering and there were pictures of the faculty. We are the only two faculty members still here and amazingly, we haven't changed much except for hair (or lack thereof).



Ramona Graves

We are so fortunate to have students that are excited to be studying petroleum engineering, a faculty team that loves what they are doing, and a support staff that puts up with all of us. This is the beginning of my 23rd year teaching in the Petroleum Engineering Department at Mines.

My Laser/Rock Destruction research continues, but a prototype is not as close to a field demonstration as I had hoped due to a slow down in funding. DOE has chosen to put their "Laser Dollars" with GTI. Unfortunately, GTI no longer uses contract researchers and will be doing all their research in-house. I am pursuing other support sources and the latest to join the team are Occidental Petroleum and the Northern Arapahoe Tribe on the Wind River Reservation. I'm still on the lecture circuit talking about the potential of high power laser applications in the Oil and Gas Industry.

Reservoir characterization continues to be my primary research interest. I work closely with professors and students in both the Geology and Geophysics Departments. The new multidisciplinary master's degree with the three departments called PETROLEUM RESERVOIR SYSTEMS is proving to be very popular. This one-year, non-thesis degree will require students to take classes in all three departments and take several of our unique multidisciplinary classes. Call the Graduate School or PE Department for more information.

The other fun and productive multidisciplinary activity is a new research center housed in the PE Department, developed and directed by Jennifer Miskimins and me, called the Center for Earth Materials, Mechanics, and Characterization

(EM²C). Our first major function is a “Workshop on Rock Mechanics Laboratory Practices” held the three days prior (October 2-4) to the SPE Annual Meeting in Denver. Jennifer and I, along with Mike Batzle in Geophysics, are coordinating the event which is sponsored by ConocoPhillips. It looks like we will have over 50 participants joining in panel discussions, poster presentations, and a very exciting “Lab Tour with Brew Crawl”.

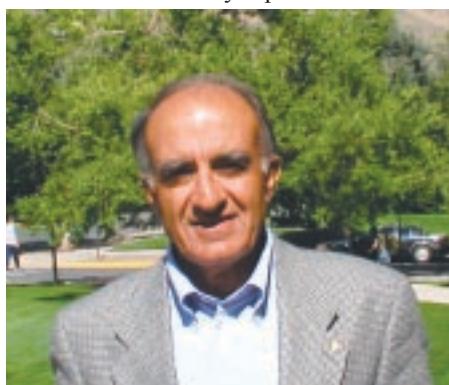
I’m still coordinating our PE exchange students. Last year we had undergraduates studying in Ireland, the Netherlands, Australia, Poland, and Austria. The exchange with the Mining University of Leoben, Austria is still the most popular with three CSM students at MUL last spring and three MUL students at CSM this year. Our students gain such an appreciation for living in a different culture and come back with great enthusiasm for the potential of working international at some point in their career.

Jake is now an employed mechanic working in the Denver area and Lacey is still in Oakland going to school. They are both healthy and happy, as am I.

Until we see each other again, I wish you peace, love, and joy.

Hossein Kazemi

The academic year 2002-2003 was a productive year for me because I was blessed with a lot of support from my colleagues in the department as well as my industry friends. A very significant event was the generous commitment of Marathon Oil Company to fund the department’s Center for Reservoir Studies with a gift of \$100,000 per year for three years. The Center probably will be designated “a center of excellence” at the university. The vision for the Center is to conduct collaborative research on timely topics of interest to the industry, and to provide relevant technical support and training to the industry sponsors. Dr. Van Kirk was very instrumental in selling the vision of the Center to the university and Marathon, and Dr. Ozkan has been leading the



Hossein Kazemi

administrative efforts to finalize the road map for the Center. Several colleagues in the department will participate in conducting research with their graduate students on subjects pertinent to the Center. We will formally announce the first phase of the technical program for the Center in early fall of 2003.

I taught two graduate courses in the fall of 2002. These courses were: Reservoir Simulation I and Numerical Solution of IOR Processes. In the spring of 2003, I taught a course on Reservoir Simulation—Streamline Approach and Classical

Methods. This course became the basis for a major research area on the use of streamline simulation in naturally fractured reservoirs. One of our graduate students is finalizing a numerical code for a dual-porosity streamline simulator. I believe the streamline approach to reservoir modeling of dual-porosity systems will produce a major impact on reservoir evaluation and performance prediction.

Another graduate student studied the effect of non-Darcy flow in naturally fractured gas reservoirs. It was discovered that abnormally large pseudo-skin values would result from the analyses of pressure drawdown and buildup tests. This information could have a significant bearing on decisions regarding well stimulation in such reservoirs. Two of our graduate students began working on the use of two overlying grids (the dual grid)—one fine and the other coarse. The course grid will be used to upscale permeability for use in the pressure solution, while the fine grid will be used to capture the channeling of flow due to local reservoir heterogeneity and the relative mobility contrasts of flowing phases.

I was also privileged to work with some of Dr. Ozkan’s students and Dr. Ozkan himself on topics related to flow in horizontal and hydraulically fractured wells. Specifically, I worked with one of Dr. Ozkan’s students on numerical simulation of non-Darcy flow in hydraulically fractured wells. Here, we were interested in the effect of the presence of a liquid phase on the non-Darcy flow of gas. Ultimately, the results should be useful in evaluation of fracture proppants. The current laboratory measured data on non-Darcy gas flow in presence of a liquid phase is inadequate and will be an area for our department to pursue.

I served on two SPE committees—the R&D and Short Books (primers). In the latter, we hope to publish in the near future three pilot primers on Seismic Inversion, Characterization of Naturally Fractured Reservoirs, and Hydraulic Fracturing Practice. Authors from the SPE, AAPG, or SEG will write these short books with the intent to inform and promote collaboration and understanding among engineers and geoscientists. Other timely topics of interest will follow.



Dee and Joe Brown relaxing during Houston Field Session

Mark G. Miller

The school year has begun once again. The students are back to quench their thirst for truth and knowledge. We are prepared. This summer we received a batch of new computers for both the graduate and undergraduate computer labs. These were installed and the old computers they replaced were put into graduate student offices. In both cases, the new machines have a processor speed about four times that of the ones they replaced. In both cases the new machines resulted in happy students. The question is now: When is plant facilities ever going to come to pick up the really old machines? You see, the old machines from the graduate student offices have gone into a storage area (the computer garage), and the machines from the storage area have gone into a hallway for plant facilities to dispose. If you are quick, you can find a 286, a 386, a couple of 486's, and a bunch of Pentium class (66 MHz) machines, not to mention a slug of LaserJet II printers (free for the taking).

As usual, Bill Eustes did a great job putting together an excellent 315 field session. The students got exposed to many different kinds of careers and made just the comments we like to hear. The students got to see some of the newest technology, have great bonding experiences (use imagination here), and come away with a better feeling about the career they are undertaking. They were excited about seeing the places and various types of work available to them. Some liked the manufacturing at Baker Hughes, others the opportunities at Anadarko, and others the high tech equipment seen offshore. Everyone came away feeling excited about the summer jobs they were about to embark upon. We are very appreciative of the company support we receive every year. I thank you for your help.

Last night was the closest Earth and Mars have been in 60,000 years. I was surprised last week by a student who didn't think you could see planets with the naked eye. I had been talking about a recent meteor shower being degraded by the moon's light, and I mentioned that Mars was sure bright. After getting over my initial shock, I explained to him where to look for Mars and that he could get more info from the Internet. The students really like using the Internet. Recent assignments have come back where over 50% of the references are from Internet sources. They are finding a lot of good information, but I don't think they realize just how transitory web pages are. Good for Mars information, perhaps not so good for a research paper.



Mark Miller

Jennifer L. Miskimins

Hello once again from Golden! As I write this article, the new school year is quickly approaching and summer has once again magically vanished. How does that happen anyway?

It's been a busy year for me since the last issue of this newsletter. My first year on faculty has been a wonderful experience (and definitely an exhausting one). It has taken awhile to adjust to the pace around here, but I am happy to say I am thoroughly enjoying it. During the last year, I have been involved with several activities around the department, and I'd like to share a few of them with you.



Jennifer Miskimins

The first item I'd like to mention is the founding of the Center for Earth Materials, Mechanics, and Characterization (EM²C) which I am co-directing with Dr. Ramona Graves. The Center is intended to be a focal point for promoting multidisciplinary research in several areas including rock mechanics, earth systems, and non-traditional characterization. EM²C is the first official center to be recognized by the Colorado School of Mines in the Petroleum Engineering Department. One of the first official acts of EM²C is the sponsorship of a rock mechanics symposium being held on October 2, 3, and 4, just prior to the annual SPE conference. If you are interested in attending this symposium, please contact me. Also, please contact Ramona or me if you believe you have a research topic that EM²C may be able to help you out with in some way. We are excited about the possibilities the Center offers us, and I would encourage you to visit us at <http://em2c.mines.edu/>.

Another change that affects me personally is that I was recently appointed as an Assistant Professor in the PE Department, which moves me into a tenure-track position. My duties around the department will not change significantly, although I will now be instructing the undergraduate stimulation class (PEGN 426) in addition to the senior multidisciplinary integrated design course (PEGN 439) and the Massadona summer field session (PEGN 316). I'm energized by this opportunity since my background and research areas fit nicely with all three of these classes.

Speaking of these classes, I'd like to thank CSM alumnus Steen Jergensen of Newfield Exploration Company for helping us secure a new data set for the PEGN 439 class. We are always looking for new "real world" data to incorporate into this design class, and I would encourage you to contact me if you have anything that you think may help us out (I will

place one caveat first—the data must include 3D seismic). For those of you who are wondering how the Massadona field session went this year, please see the article on the PEGN 316 Field Session.

One final item before I close—I'd like to thank all those who responded to last year's alumni survey and encourage you all to response to this year's survey which is

enclosed in this newsletter. These surveys are valuable in our assessment of various components of our curriculum, as well as vital to our ABET accreditation. Thanks again for helping us out!

Please feel free to contact me anytime at (303) 384-2419 or jmiskimi@mines.edu or visit my web site at www.mines.edu/~jmiskimi/. I hope to see you at SPE in Denver!!



Full-time Faculty

From left to right: Turhan Yildiz, Jennifer Miskimins, Richard Christiansen, Ramona Graves, Bill Eustes, Erdal Ozkan, Mark Miller, John Fanchi, Craig Van Kirk, the new prof, Larry Chorn is not present, (see page 3.)



Dee and Chris without whose help all would come to a halt, with Craig.



Scenes from Massadona . . .

Massadona!! The name conveys a variety of memories to alumni, a fresh feeling of accomplishment to seniors, and a sense of dread to underclassmen.

For the 2003 PEGN 316 field session, we had the largest group we have had in a few years. Twenty-seven juniors and seniors attended this year, and I'm happy to announce all twenty-seven survived! I feel the need to announce their survival since it seems that prior to the camp, several of the attendees doubt this will be the outcome. As someone who has now been involved with the camp for three years, I find it interesting how the students' attitudes change as the camp progresses. At the end of camp, most of the students realize that it wasn't quite as bad as the previous year's class had made it sound. Nevertheless, they are eager to indoctrinate the next year's class in the perils that await them!!

Once again Dr. Donna Anderson from the Geology and Geological Engineering Department and I co-instructed the camp. We were joined by two TA's, Brian Romans and Andrea Blecha, who helped to make the camp a success. This was Brian's second and last year at camp as he is leaving to start work on his Ph.D. at Stanford. We wish him all the best in this new endeavor. This was Andrea's first year at camp, and



Wade putting on a volleyball clinic for his classmates.

she's already signed on for next year—much to the delight of Donna and me.

This year's camp consisted of the classic exercises, which include a combination of geology and petroleum-oriented topics. We were hosted by ChevronTexaco and visited their Rangely Oil Field. Production Logging Services, Inc., gave a day-long school on production logging. This school always receives high marks from the students, and we appreciate Craig Stratton and his crew for their assistance over the last two decades. We also reinstated a tour of the Red Wash Field,



Large groups of people can survive Massadona together.



Enjoying the day in Josie's Canyon, Dinosaur National Monument.

operated by Questar, which hadn't been included for several years. The weather cooperated for the most part this year with only one day of snow. Fortunately, this snow day occurred during the mapping exercise on Skull Creek and not the rafting trip!

Every year we try to make certain additions to the camp that either improve the living conditions or help to run the camp. I know this will shock and appall several of you, but last year we purchased kerosene heaters for the individual cabins. As you can imagine, they were received with an enormous amount of appreciation from the students. This year we added handheld radios to our repertoire to help the instructors and TA's communicate on

the outcrops and for safety reasons.

One of the things I enjoy most about being involved with the PEGN 316 field session are the stories I hear from alumni about their Massadona experiences. I would encourage you to keep sharing these stories with the CSM PE community, and if you have a minute, please email them to me at jmiskimi@mines.edu. By having a collection of these chronicles that I can share with the students, I can convey the history and traditions associated with the camp.

As with all the annual articles, I have included a few pictures from the camp that I hope you will enjoy. Additionally, we have updated the PEGN 316 for 2003 and would encourage you to visit it at <http://www.mines.edu/academic/petroleum/316/PEGN316.html>.



Someone said there's money down that hole.

... and Field Session in Houston



On the ConocoPhillips Deepwater Pathfinder.



Being hoisted aboard the Apex Oil and Gas operated platform.



Apex Oil and Gas Well #1 on the Apex Platform in Vermillion Block 128, TODCO RBF 206 jack-up.



Video conference with alumni Justin Raithel and Eric Miller in Anadarko's Operations Intelligence Center.



A group shot at Aramco Services in Houston.

Erdal Ozkan

The 2002-2003 academic year was busy but productive for me. As always, I enjoyed teaching and even learned a few new things myself. I taught my regular classes; PEGN 414 (Well Testing), PEGN 601 (Applied Mathematics for Fluid Flow in Porous Media), PEGN 505 (Horizontal Wells), and PEGN 605 (Well Testing and Evaluation). I was also part of the PEGN 315 Field Session team to visit the Gulf Coast. Our excellent hosts and enthusiastic group of students made this trip very enjoyable beyond my expectations.

My research activities continued at a faster pace. I completed the Stripper Well Consortium project titled "Optimization of Plunger Lift Performance in Stripper Gas Wells" with the help of Dr. Mark Miller. Dr. Turhan Yildiz and I received support from PEMEX for our "Horizontal Well Completion Optimization" project. In June, we started a new project with Dr. Hossein Kazemi on "S t r e a m l i n e Simulation of the Tracer and CDG Injection to the Chihuido de la Sierra Negra Field" for Repsol YPF, Argentina. I have also been involved in Dr. Hossein Kazemi's efforts to start a Center of Excellence for Reservoir Studies. You can read about the exiting support we obtained from Marathon Oil Co. in Dr. Kazemi's letter.

I have also been involved in research with several of my students. We have been privileged to have Dr. Kazemi involved in these research efforts. Some of the problems we have been investigating include the choking effect in vertical fractures intercepted by horizontal wells, non-Darcy flow in finite-conductivity fractures under multi-phase flow conditions, pressure drop due to non-Darcy flow in naturally fractured gas reservoirs, estimation of skin factor from horizontal well tests, interpretation of interference tests in horizontal wells, and pressure transient behavior of horizontal and undulating wells in anticlines and domes.

In addition to teaching courses and doing research, my responsibility as the Graduate Program Coordinator in the department took considerable time. Our graduate program has been healthy and even growing at a time most graduate programs in engineering have been suffering from decline in enrollments. Like all programs, we experienced some drop in our international student numbers after September 11 but we could adapt to the changing conditions quickly and successfully. This year, we accepted 17 new graduate students to our program. As always, the demographics of our new graduate student group includes a wide variety of countries.



Erdal Ozkan

We have 7 new US citizens, together with 10 international students from 8 different countries (2 from UAE, 1 from Venezuela, 1 from Argentina, 1 from Nigeria, 1 from China, 1 from Thailand, 1 from The Netherlands, 1 from Austria, and 1 from Iran). Altogether, we have 52 students in our graduate program, which makes us one of the largest graduate programs in Petroleum Engineering in the US.

Because this year's SPE Annual Meeting is in Denver, we are hoping that you will make a special effort to attend the meeting. If you can make it, we will be extremely happy to see you during the meeting and the alumni function. Please make sure to check the program to find out about the paper presentations of the CSM students and faculty. We have 10 papers in the meeting this year and most of them are with our students. We are very proud of our students and hope you can come to their presentations to show your support.

Looking forward to seeing you in Denver.

Turhan Yildiz

This is the third newsletter I am writing. The fall semester of 2003 started with a new teaching assignment. I will be teaching the multidisciplinary graduate class "Integrated Exploration and Development" the first time. Wish me good luck.

The academic year of 2002/2003 was a reasonably productive year in terms of research and publication. I authored two journal articles and two papers in conference proceedings. One paper was published in SPEJ. The second one will appear in the next issue of JCPT. Both papers are about the reservoir engineering aspects of multilateral wells.

This summer, I visited my parents and spent some time with them since my father has been ill. My father is getting better and the prognostics are quite encouraging. We have been fortunate and grateful.

I wish you all peace, happiness, and prosperity. I look forward to seeing you during the SPE Annual Meeting in Denver.



Turhan Yildiz

Student Organizations

Society of Petroleum Engineers

by Sithu Moe Myint (*Beau*), President

Summer nears its end and with the beginning of a new semester, students partake in their endeavor for academic excellence once again. Greetings. My name is Sithu Moe Myint and I come from Myanmar, a country in Southeast-Asia formerly known as Burma.

The student chapter of SPE at Mines is faced with building upon a tradition that has lasted many years. With our new young and dynamic members and under the guidance of our faculty advisor, Dr. Richard Christiansen, not only as an organization, but rather as a team, we look forward to working together in fulfilling the needs and expectations of fellow students and the faculty.

This fall of 2003, SPE aims to develop and strengthen the bonds between students and the petroleum industry. As many are aware, networking plays a major role in one's success, especially in the discipline of Petroleum Engineering. SPE intends to host both technical and industrial presentations made by Mines Alumni and representatives of different operating oil companies to not only further enhance the students' knowledge in all aspects of Petroleum Engineering, but to provide them with an opportunity to understand and appreciate some of the issues they will face upon graduation.

With the SPE Annual Technical Conference and Exhibition to be held in Denver this year in October, our members hope that fellow students will grasp this opportunity to initiate creating their networks and bonds for their future. The student chapter of SPE at Mines is determined in assisting in any way possible to make this event a success and unforgettable experience for all those that wish to participate.

I look forward to working with my fellow colleagues in making this year full of activities ranging from those related to academics, to those which will bring fun and frolic to both students and faculty of the Colorado School of Mines Petroleum Engineering Department. Lastly, if you are interested in attending or sharing knowledge in one of our monthly seminars, please contact our Vice-President Matt Gallagher at magallag@mines.edu. We thank you for your continuous support.



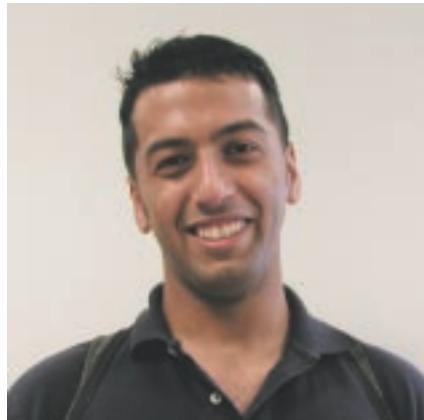
Beau

Pi Epsilon Tau

by Ali Husain, President

Let me introduce myself, I am Ali Husain from Kuwait, this year's president of Pi Epsilon Tau (PET). PET is the petroleum engineering honor society. It is an organization with many purposes, such as fostering the bond between the petroleum industry and the members of the organization, broadening the scope of activities of PET members, and a primary noble goal is to keep and maintain ideals of the engineering profession.

All the members of PET meet the high standards of the organization to be able to join. They are chosen based on many things such as leadership, scholarship, and sociability. In order for an undergraduate student to be eligible to join PET they must have a minimum cumulative grade average of 3.0. However, for graduate students they must have a minimum of 3.25



Ali

cumulative grade average. The entire Colorado School of Mines Petroleum Engineering faculty are members of PET. Currently we have twenty members in the organization. The faculty of the Petroleum Engineering Department work with us at the beginning of every year to help choose new members for the organization.

As members of PET, we have an array of activities that we are involved in. Last fall PET members participated in the Denver Race for the Cure with the proceeds going to breast cancer research. We have adopted Alderson Hall as our service project. Last year we landscaped the east side of the building (in a rain storm!) and painted the undergraduate multidisciplinary classroom. This year we plan to continue our presence in the Denver Race for the Cure, increase community involvement, and continue to improve the development of the landscaping on campus. Special thanks for PET advisor Dr. Ramona Graves for the great help and support she gives for the organization every year. If you have any questions or suggestions please contact me at ahusain@mines.edu.

American Association of Drilling Engineers

by Chris Stolte, President

As president I would like to introduce myself. I'm Chris Stolte originally from El Paso, Texas but have lived in Aurora, Colorado for the last 10 years. The Colorado School of Mines chapter of the American Association of Drilling Engineers (AADE) is a professional organization that allows student members to integrate and familiarize themselves with issues they face in the petroleum industry. This exposure gives students important insight and knowledge in drilling engineering. In 1996, the Colorado School of Mines AADE group became the first



Chris

student chapter in the nation. Many universities and colleges across the nation are following our lead by creating student chapters of their own.

AADE has continued to grow and enjoy success. Over the past year, we have increased our fundraising efforts. This has allowed our organization to increase opportunities for members to become involved in events outside of school. One focus is to work with other student chapters of the petroleum industry to become involved in the Golden and surrounding communities. Last fall the members of Pi Epsilon Tau (PET) participated in Denver Race for the Cure, followed by an AADE and Society of Petroleum Engineers (SPE) sponsored barbecue. We look forward to continuing these service events to show the community the caliber of students in the Petroleum Engineering Department.

AADE has continued its tradition of monthly luncheon meetings in which a member from the drilling industry is invited to discuss drilling related topics in a "lunch n' learn" forum with the students. Our advisor, Dr. Bill Eustes has used his research of drilling on Mars and coring in Antarctica to bring an added excitement to our organizational meetings. On several occasions, members from the Mars and Antarctica research teams have spoken at our luncheon meetings. Last year, the AADE student chapter visited the National Ice Coring Laboratory. This was an opportunity not available to students in the past. Hans Wychgram and Dominic Spencer conducted research alongside Dr. Eustes. Hans and Dominic presented

their findings at the AADE technical conference in Houston last April. This spring we also organized an AADE event in downtown Denver in which members from the drilling industry were invited for dinner and a speech given by Ford Brett, president of OGCI, about the state of the drilling industry. The AADE Denver Chapter continued their strong support for CSM by allotting three scholarships to our students.

The CSM AADE chapter has high expectations for continued success and this year's officers Chris Stolte-President, Ty Woodworth-Vice President, Steve Henning-Treasurer, Jeff Reimer-Secretary, and Wade Binkley-Joint Session Chair look forward to meeting this challenge. We are currently planning rig trips to the western slope, rig simulator night, and several other activities. If you would like to join us for a meeting or have any suggestions or comments, contact me Chris Stolte at cstolte@mines.edu.



Best Friends

Alumni Reception at SPE Conference

To Our Petroleum Alumni:

Your attendance is requested at the Colorado School of Mines, Petroleum Engineering Alumni Reception to be held during the annual SPE Technical Conference in Denver, Colorado, October 5 through 8, 2003. The Alumni Reception will be held on Tuesday evening, at the Hyatt Regency Denver Hotel, the Grand Ballroom, 1750 Welton Street, from 5:30 to 7:00 p.m. The charge is \$25. As always, there will be plenty of food with a cash bar.

HOW TO REGISTER: Phone Kathy Breit, Program Director of CSM's Alumni Office at (303) 273-3290, or e-mail kbreit@mines.edu or phone the Petroleum Engineering Office at (303) 273-3740, or e-mail dbrown@mines.edu prior to SEPTEMBER 26, 2003. Drop-ins are welcome; however, we would appreciate it if you would make a reservation in advance.



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