CU-Boulder/NIST physicist Ana Maria Rey wins MacArthur 'genius' grant[1]

[2]

Ana Maria Rey, a theoretical physicist and a fellow of JILA, a joint institute of the University of Colorado Boulder and the National Institute of Standards and Technology, on Wednesday was named a winner of a 2013 MacArthur Fellowship, commonly known as the "genius grant."

Rey also is an assistant research professor in the CU-Boulder Department of Physics. She teaches undergraduate and graduate classes.

Rey is the ninth faculty member across the CU system – and eighth from CU-Boulder – to win the prestigious award from the John D. and Catherine T. MacArthur Foundation of Chicago. She also is the fourth physics faculty member and third JILA fellow named a MacArthur Fellow.

Rey, 36, was one of 24 recipients of the 2013 "no-strings attached" funding. She will receive $625,000 paid out over five years.

"It is a great honor for me to be a MacArthur fellow and to receive such great recognition of my work," Rey said. "I want to thank JILA, NIST, CU-Boulder and the outstanding group of colleagues, collaborators and students who have allowed and helped me to accomplish the research I have done."

The MacArthur Foundation selection committee cited Rey as an "atomic physicist advancing our ability to simulate, manipulate, and control novel states of matter through fundamental conceptual research on ultracold atoms."

"We congratulate Professor Rey on this exciting award, and, we also congratulate our faculty, whose ranks now include five Nobel laureates and eight MacArthur Fellowship winners," said CU-Boulder Chancellor Philip P. DiStefano. "I believe Professor Rey's work is emblematic of the research, innovation, and discovery at CU-Boulder, a body of work and a collection of great minds that is unmatched anywhere in the Rocky Mountain region and few places around the nation."

Tom O'Brian, chief of the NIST Quantum Physics Division and Rey's supervisor, said, "Ana Maria has rapidly established herself as one of the world's top young theoretical physicists. She has a special ability to make very practical applications of theory to key experiments. Ana Maria has been crucial to the success of such world-leading NIST/JILA programs as ultracold molecules, dramatic improvements in optical lattice clocks, and use of cold atom systems and trapped ion systems for quantum simulations."

At JILA, Rey works with ultracold atoms and molecules that are trapped in an "optical lattice," a series of shallow wells constructed of laser light. Atoms that are loaded into an optical lattice behave similarly to electrons in a solid crystal structure. But while it's difficult to change the properties of a solid crystal, the properties of an optical lattice — which essentially acts as a "light crystal" — are highly controllable, allowing Rey to explore a whole range of phenomena that would be nearly impossible to study in a solid crystal system.

Ultimately, Rey hopes her research will lead to the ability to engineer materials with unique characteristics such as superfluids — liquids that appear to move without regard for gravity or surface tension — and quantum magnets — individual atoms that act like tiny bar magnets.

Rey began studying physics at the Universidad de los Andes in Bogota, Colombia, where she received a bachelor's degree in science in 1999. She came to the United States to continue her studies, earning a doctorate in physics from the University of Maryland, College Park, in 2004.

Before coming to JILA in 2008, Rey was a postdoctoral fellow at the Harvard-Smithsonian Center for Astrophysics in Cambridge, Mass., and a postdoctoral researcher at NIST in Gaithersburg, Md.

Previous CU-Boulder faculty members who have won a MacArthur Fellowship include David Hawkins of philosophy in 1981, Charles Archambeau of physics in 1988, Patricia Limerick of history in 1995, Margaret Murnane of physics and JILA in 2000, Norman Pace of molecular, cellular and developmental biology in 2001, Daniel Jurafsky of linguistics and the Institute of Cognitive Science in 2002 and Deborah Jin of JILA, NIST and physics in 2003. Eric Coleman, M.D., of the University of Colorado School of Medicine won last year.

“Everyone at JILA is extremely proud of Ana Maria Rey’s accomplishments and wholeheartedly congratulate her for this prestigious MacArthur Fellowship,” said JILA Chair Murray Holland. “She has an incredibly quick mind for physics and is one of the truly creative and ingenious scientists of her time, while also being a wonderful teacher and mentor to both undergraduate and graduate students. This is a great honor for Ana Maria, and a tremendous recognition of the important research programs in JILA and NIST.”

Rey is a highly effective mentor for an unusually large group of graduate students and postdoctoral fellows given the early stage of her career, O’Brian said. One of her recent graduate students, Michael Foss-Feig, won the prestigious 2013 Best Thesis Award of the American Physical Society’s Division of Atomic, Molecular and Optical Physics. Rey herself won the same award in 2005 as a graduate student at the University of Maryland.

On Tuesday, in another honor, the American Physical Society named Rey the winner of the 2014 Maria Goeppert Mayer Award, which recognizes outstanding achievements by a woman physicist in her early career.

More information on Rey is available on the Web at http://www.macfound.org/fellows/901[3] and http://jila-amo.colorado.edu/science/profiles/ana-maria-rey[4].

Five questions for Tim Chamillard[5]

[6]
Teddy bears ? disappearing teddy bears, exploding teddy bears, and even burning teddy bears ? are a recurring and amusing theme in Tim Chamillard’s classes. After admitting to this, he quickly adds an “Animal” Rights Disclaimer: No real teddy bears are ever hurt in the teddy bear video games developed by his students.

Chamillard is an associate professor of computer science at the University of Colorado Colorado Springs. He holds degrees in electrical engineering, computer engineering and computer science. He previously taught at the Air Force Academy and also has worked in private industry.  In 2003, he joined the UCCS faculty and teaches game design and development.

He also is the first UCCS faculty member to develop a Massive Open Online Course (MOOC), a free, eight-week course on beginning game programming.

His research includes computer science education, and he sometimes uses his classrooms to determine the effectiveness of new or modified teaching/learning ideas. He also has worked with the Bachelor of Innovation team at the university as they “implemented some pretty cool ideas within that family of degrees. My focus is on the Bachelor of Innovation in Game Design and Development (GDD) degree … Our degree is different from the other game development degrees from other universities in large part because of the innovation and entrepreneurship components that are included in it.”

**1.  What was your pathway to CU?**

I spent six years teaching at the Air Force Academy before retiring from the Air Force in late 2002, and that experience showed me that I definitely wanted to get a tenure-track position after retiring. In early 2002, I applied for a number of tenure-track positions (including a position in the computer science department at UCCS), went on a number of

interviews, and was getting some good job offers, but decided that I really wanted to return to Colorado Springs.

Because I didn't make the “short list” for the UCCS position, I decided to give up continuing as a college professor and started looking for an industry job. During my networking for my job search, I contacted my prior department chair from the Air Force Academy, who was running his own company. He didn't have a job to offer me, but he did contact a colleague in the computer science department at UCCS in his field and put in a good word for me. Long story short, I ended up getting hired into my current position.

I love teaching so much that I can’t believe I ever considered giving it up just to live in a specific place. Luckily, it all worked out in the end.

**2. How did you choose programming as an interest? Are you still developing games with your sons?**

I always liked science and math as a kid, and my high school had a computer lab so I taught myself how to program once I got there. (Yes, this was before PCs!) I guess I just really like the logical, detailed approach we use in the STEM fields. For my degrees, I worked my way from electrical engineering through computer engineering to computer science, and I thoroughly enjoyed learning about each of them. Even for the game development I do, my focus is on the programming and, to a lesser extent, the design aspects of the games. I generally leave the art and music to someone else, and that's a good thing! For teaching, I thought it would be an interesting thing to try, and once I got to do it, I realized pretty quickly that teaching is what I’m meant to be doing.

I worked for 5 1/2 years as an indie game developer in a company I started with my two sons in 2007. We’ve since closed the company -- it's strange how your kids can grow up, get jobs and move out and on to other things -- but it was a great experience. The three of us were equal members in the company, so my sons could outvote me on company decisions (insert appropriate expletive here), but it was incredibly cool working with my sons in a professional way. We even won some contracts to develop games for a variety of customers and released a commercial game as well, so that was great. I share both good and bad stories about our company experiences with my students since the main goal for our Bachelor of Innovation in Game Design and Development is to prepare students to become indie game developers.

**3. You are the first UCCS prof to develop and offer a MOOC for students around the world. How hard/easy was it to develop?**

My MOOC is Beginning Game Programming with C#, which is designed to teach people who have never programmed before how to start programming video games. Because the course is only eight weeks long, the students certainly won't come out the other end as professional game developers ? that takes years, not weeks ? but they'll have the foundational ideas they need to continue their studies in the area.

The course was shockingly hard to develop, especially since it's based on a course I already teach at UCCS. I'm sure that's in part because I'm very aware that I'm representing UCCS and the CU system on an international level rather than just in my classroom, so I've spent a lot of time trying to make the course as good as it can possibly be rather than "good enough." My course was also the first course opened up for enrollment in the U.S. State Institutions category on Coursera, and I want to make sure the learning experience for the students in the course is as good as or better than in the other courses on that platform.

The fact that I had more than 21,000 students enrolled on the first day of the course also impacted my desire to do a good job. That high number was only possible because people throughout the CU system worked so hard to get the CU campuses onto Coursera. Even at the historically low MOOC completion rates, it would take me more than 45 years to get the same number of students to complete my on-campus course.

I'll admit I was in some ways my own worst enemy as I got the course ready for launch. In addition to building the course itself, I also built a separate Web application that students can use to explore the course structure. For example, students can select a particular module learning objective and view all the assessments related to that objective as well as seeing the course learning objective(s) that module learning objective supports.

I'm even more excited about the fact that I teamed up with a group of three UCCS Game Design and Development majors over the summer to build a Programming Party game that the MOOC students can play to motivate them to complete the required assessments and optional activities in the course. Students who complete those course activities get to explore the story in the game, amass hordes of gold and play 11 different mini-games.

The MOOC started Sept. 16, so it's still early, but things are going fine. My biggest lesson learned so far is that I don't have to feel compelled to answer every question or comment posted on the discussion forum, because that would quickly become unworkable; instead, I just need to wait a few minutes and one of the other students in the course will respond. That approach goes against my nature as a professor, but it's the only workable solution at this scale and it seems to be working pretty well.

**4. What do you consider the upside of MOOCs? What are the downsides?**

I think the most obvious upside of MOOCs is that they open up the availability of the course topics to orders of magnitude more students. There are obviously lots of resources available to people who want to learn new things, but there also are many people who prefer a little more structure to their learning experience than "surf the Web or read a pile of books until you've figured it all out." MOOCs give tens or hundreds of thousands of people access to that structured learning experience.

I really can't express how exciting it is to me to have so many people pursuing beginning game programming with my help. I've heard lots of people questioning why anyone would want to do a MOOC, usually in the context of "How do we make money doing it?" For me, though, making money isn't the point. The goal is to open up the exciting world of programming to so many people who might not be able to explore it otherwise.

The biggest downside of MOOCs is the fact that, on this scale, we really need to have the students grade each others' work rather than have the professor or even a mob of TAs do the grading. It's certainly true that MOOC students don't get the same personalized one-on-one attention they get from the professor in other (at least small enrollment) environments, but since I want my students to be independent learners anyway that's of less concern to me personally. I think it's probably true that the MOOC experience for a student isn't as rich as an in-person experience or an online experience with a limited class size, but the choice for many MOOC students is the MOOC or nothing.

**5. Do you continue your gaming interests outside of the classroom?**

Probably not surprisingly, I do manage to find some time every week to play video games. I'm a driving game fan, so that's what I play almost exclusively. Yes, I'll admit I actually have a driving seat and a driving wheel/pedal combo that even has a clutch and a shift gate.

Over the past (unspecified number of <grin>) decades, I've pursued a variety of athletic interests. I've completed a number of centuries (100-mile bike rides), marathons and shorter running races (including the Pikes Peak Ascent three times) and triathlons of various lengths. My biggest athletic accomplishment is completing an Ironman-distance race: A 2.4-mile swim, 112-mile bike and 26.2-mile run makes for a long day!

Finally, I've just started (re-)learning to play the guitar. I played for a few years as a teenager, then put my guitar away as family and work took up most of my time. My daughter recently asked me to play and sing at her wedding, though, so I dusted off my old Yamaha acoustic and started back at it. The cool thing is I'll be taking the guitar I had with me the night I met my wife over 34 years ago and will be playing it at my daughter's wedding. Now if I can just learn to play like Paul Simon in less than six months, I'll be in good shape. How hard can that be?

Guide to resources for faculty, staff affected by floods[7]

From Employee Services: University of Colorado employees on all four campuses had their lives disrupted by the recent flooding. Understanding that the recovery process can be long, difficult and trying, Employee Services and the CU Health and Wellness Trust have arranged to make the following services available to employees whose lives were directly affected by these natural disasters.

**Enrollment extended for all benefits**

Understanding that many employees were in the midst of their benefits enrollment period when the flooding occurred, the university has arranged an enrollment extension for all benefits.
[8]

The recent flooding that devastated Colorado communities was a striking reminder of the physical destruction and harm caused by natural disasters. The financial toll for individuals is often less apparent, but no less devastating.

Those affected by floods may have a difficult time recovering financially. Some may be unsure what steps to take next. That's where the free booklet "Disaster Recovery: A Guide to Financial Issues[9]" can provide help.

It outlines steps to regain financial stability that must be addressed immediately – and in the weeks and months following a disaster. This collaboration between the National Endowment for Financial Education, the AICPA Foundation and the American Red Cross outlines:
Restoring household stability Money and cash flow Employment Managing an injury or disability Stabilizing your finances Lawsuits and settlements Managing a property Loss Future financial needs

**Preparing for the future**

The state's recent floods, forest fires and other disasters may have some thinking about how to prepare and mitigate the effects of a disaster. That's where the companion guide "Disasters and Financial Planning: A Guide for Preparedness[10]" can prove helpful.

The booklet details measures to help families avoid a financial crisis in the event of a disaster. Topics include:
Making a disaster plan Protecting property Protecting income Protecting health and life Protecting records Protecting loved ones **Medical and dental plans:** CU has the authority to authorize late enrollment on Medical and Dental plans. **Life and disability insurance plans:** University staff is writing an amendment to CU's contract that will allow an enrollment extension for optional life insurance, voluntary life and short-term disability plans. This amendment was authorized by Standard Insurance Co. **FSA plans:** The IRS will allow late enrollment as long as the university clearly designates the circumstances under which an extension is allowed, a specific time period this will be allowed, and applies the extension fairly and consistently to all employees. **PERA:** University staff will work directly with PERA's legal team to advocate for employees, if the situation arises.
**Accommodations for using CU Health Plans**

**Anthem plans** Employees directly affected by the floods and enrolled in health plans administered by Anthem Blue Cross and Blue Shield may take advantage of the following services:
Extending filing claim deadlines. Suspending early refill limits for prescriptions. Authorizing payment to replace covered Durable Medical Equipment supplies for affected employees who call to request them. Providing member access to a 24-hour Nurse Helpline. Allowing employees to see any physician necessary to provide access to covered care. Offering 24-hour, free telephone counseling and referral services through Anthem's Employee Assistance Program. This phone number can be found on the back of the member's identification card or by calling 1-877-208-8240. These medical and pharmacy guidelines are effective for the next 30 days. For additional questions, members should call the phone number on the back of their membership card. If employees do not have their card or need replacement cards, call 1-800-735-6072.

**Kaiser plan** As of Sept. 16, all Kaiser Permanente medical offices are open in Colorado to serve CU Health Plan members. Additional resources:
Call the Kaiser Permanente 24-hour medical advice line at 303-338-4545. Email your doctor on kp.org[11]. For behavioral health appointments, call 303-471-7700. For more information, go to kp.org[11] and search "grief" or "depression."

**Distributions from Pension and Savings plans**

Several university pension and savings plans allow for plan loans or hardship distributions, which may be helpful as employees rebuild and repair.

**University of Colorado 403(b) Plan** Plan Loans are available only from annuity contracts with TIAA-CREF, MetLife or VALIC, under the following terms and conditions:
The total of all outstanding 403(b) Plan loans cannot exceed the lesser of: $50,000, less the highest balance of any plan loan not with the university over the past one-year period; or the greater of one-half of the present value of the employee's plan account balance, or $10,000. Repayment shall be in regular intervals no less frequent than quarterly, over a term not exceeding five years (unless purchasing a principal residence). Interest shall be applied at a commercially reasonable rate.
Hardship distributions are available under the following terms and conditions:
If used to repair damage to the principal residence or for medical expenses for the employee, spouse, dependent or designated plan beneficiary, purchase of a principal residence, college tuition and fees for employee, spouse, dependent or beneficiary, to prevent eviction from or foreclosure on employee's principal residence, or funeral expenses for parent, spouse, child, dependent or beneficiary. If there is an immediate and heavy need, defined as: The employee does not have sufficient funds of his/her own; All available plan loans and non-hardship distributions have been used; The distribution is not in excess of the amount of the immediate and heavy need (including tax and penalties resulting from the distribution); and The employee's salary deferral contributions into the 403(b) Plan are suspended for at least six months after receipt of the hardship distribution.
Regular distributions are available if terminated from employment or if over age 59.5; employees should contact their investment vendor to begin the distribution process. If an employee has made rollover contributions into the 403(b) Plan, such contributions are eligible for distribution at any time. Please note that regular distributions, hardship distributions and a distribution of prior rollover contributions made into the plan are includable in income, and are subject to the 10 percent early withdrawal tax penalty if made to an active employee who is not yet age 59.5 or to a former employee who separated from service with the university prior to attaining age 55.

**PERA 401(k) Plan** Plan loans are available under the PERA 401(k) Plan under terms and conditions similar to under the university's 403(b) Plan discussed above. Hardship withdrawals are available under the PERA 401(k) Plan under terms and conditions similar to under the university's 403(b) Plan discussed. Regular distributions are available if terminated from employment or if over age 59.5. For more information regarding available plan loans and distributions from the PERA 401(k) Plan, employees should contact PERA directly at 1-800-759-7372, because the university does not administer the PERA 401(k) Plan

**PERA 457 Plan** Plan loans are available under the PERA 457 Plan under terms and conditions similar to those under the university's 403(b) Plan discussed above. Hardship withdrawals (referred to as "unforeseeable emergency withdrawals") are available under the PERA 457 Plan under terms and conditions similar to those under the university's 403(b) Plan discussed above. Regular distributions are available only if terminated from PERA employment. For more information regarding available plan loans and distributions from the PERA 457 Plan, employees should contact PERA directly at 1-800-759-7372, because the university does not administer the PERA 457 Plan.

**Faculty Housing Assistance Program loan options available**

Full-time tenured and tenure-track faculty members who own homes damaged in the recent floods, who have equity in their homes and who plan to take out home equity loans to make their homes habitable after storm damage may qualify for Faculty Housing Assistance Program loans from the university. Such faculty members would need to apply at https://www.cu.edu/content/faculty-housing-assistance-program[12], use the university's approved financial

institution for their new first mortgages and provide documentation of the losses suffered. General information about the Program can be found at https://www.cusys.edu/academicaffairs/documents/FHAP-description.pdf[13]. Faculty members with existing shared-appreciation loans through the university's Faculty Housing Assistance Program should contact the Treasurer's Office, by visiting 303-837-2182 or https://www.cu.edu/treasurer[14], if making major repairs or improvements due to the recent floods. If expenditures qualify as capital improvements, these expenditures could reduce the amount owed to the university when the existing loans are repaid.

**Have questions?** If you have questions about using these services, please contact the Employee Services benefits professionals at 303-860-4200 or toll-free at 1-855-216-7740, and select option 3.

## CU-Boulder Disaster Recovery Fund now over $141,000[15]

A CU-Boulder student helps clear debris Saturday during volunteer efforts to help flood victims. (Photo: Casey A. Cass/University of Colorado)

More than 1,000 donors so far have contributed over $141,000 in the last nine days to the CU-Boulder Disaster Recovery Fund[17], representing a strong and compassionate response to the needs of CU-Boulder students, faculty, and staff in the wake of this month's historic Colorado flood.

For a high proportion of donors, their CU disaster-recovery gift represents their first gift to the university. Many donors have indicated that their CU-Boulder recovery gift is in addition to gifts made to other relief organizations such as United Way and the Red Cross.

"I've been so impressed by the fortitude shown by the CU-Boulder community," commented one donor, referencing a CU staff acquaintance whose own basement had filled with mud yet came in to work on critical campus recovery efforts.

Fundraising for the Disaster Recovery Fund continues: The documented need – now well into six figures – continues to exceed the available funds. Nearly 100 students continue to require temporary housing in area hotels; hundreds have required supplemental funding for meals, textbooks and other essentials.

**To contribute to the CU-Boulder Disaster Recovery Fund, click here[17].**

## New CU-Boulder-led study: 'Microbial clock' may help determine time of death[18]

An intriguing study led by the University of Colorado Boulder may provide a powerful new tool for forensic scientists attempting to determine the time of death in cases involving human corpses: a microbial clock.

The clock is essentially the lock-step succession of bacterial changes that occur postmortem as bodies move through the decay process. And while the researchers used mice for the new study, previous studies on the human microbiome – the estimated 100 trillion or so microbes that live on and in each of us – indicate there is good reason to believe similar microbial clocks are ticking away on human corpses, said Jessica Metcalf, a CU-Boulder postdoctoral researcher and first author on the study.

"While establishing time of death is a crucial piece of information for investigators in cases that involve bodies, existing techniques are not always reliable," said Metcalf of CU-Boulder's BioFrontiers Institute. "Our results provide a detailed understanding of the bacterial changes that occur as mouse corpses decompose, and we believe this method has the potential to be a complementary forensic tool for estimating time of death."

Currently, investigators use tools ranging from the timing of last text messages and corpse temperatures to insect infestations on bodies and “grave soil” analyses, with varying results, she said. And the more days that elapse following a person’s demise, the more difficult it becomes to determine the time of death with any significant accuracy.

Using high-technology gene sequencing techniques on both bacteria and microbial eukaryotic organisms like fungi, nematodes and amoeba postmortem, the researchers were able to pinpoint time of mouse death after a 48-day period to within roughly four days. The results were even more accurate following an analysis at 34 days, correctly estimating the time of death within about three days, Metcalf said.

A paper on the subject was published Sept. 23 in the new online science and biomedical journal, eLIFE, a joint initiative of the Howard Hughes Medical Institute, the Max Planck Society and the Wellcome Trust Fund. The study was funded by the National Institutes of Justice.

The researchers tracked microbial changes on the heads, torsos, body cavities and associated grave soil of 40 mice at eight different time points over the 48-day study. The stages after death include the “fresh” stage before decomposition, followed by “active decay” that includes bloating and subsequent body cavity rupture, followed by “advanced decay,” said Chaminade University forensic scientist David Carter, a co-author on the study.

“At each time point that we sampled, we saw similar microbiome patterns on the individual mice and similar biochemical changes in the grave soil,” said Laura Parfrey, a former CU-Boulder postdoctoral fellow and now a faculty member at the University of British Columbia who is a microbial and eukaryotic expert. “And although there were dramatic changes in the abundance and distribution of bacteria over the course of the study, we saw a surprising amount of consistency between individual mice microbes between the time points -- something we were hoping for.”

As part of the project, the researchers also charted “blooms” of a common soil-dwelling nematode well known for consuming bacterial biomass that occurred at roughly the same time on individual mice during the decay period. “The nematodes seem to be responding to increases in bacterial biomass during the early decomposition process, an interesting finding from a community ecology standpoint,” said Metcalf.

“This work shows that your microbiome is not just important while you’re alive,” said CU-Boulder associate professor Rob Knight, the corresponding study author who runs the lab where the experiments took place. “It might also be important after you're dead.”

The research team is working closely with assistant professors Sibyl Bucheli and Aaron Linne of Sam Houston State University in Huntsville, Texas, home of the Southeast Texas Applied Forensic Science Facility, an outdoor human decomposition facility known popularly as a “body farm.” The researchers are testing bacterial signatures of human cadavers over time to learn more about the process of human decomposition and how it is influenced by weather, seasons, animal scavenging and insect infestations.

The new study is one of more than a dozen papers authored or co-authored by CU-Boulder researchers published in the past several years on human microbiomes. One of the studies, led by Professor Noah Fierer, a co-author on the new study, brought to light another potential forensic tool -- microbial signatures left on computer keys and computer mice, an idea enthralling enough it was featured on a “CSI: Crime Scene Investigation” television episode.

“This study establishes that a body’s collection of microbial genomes provides a store of information about its history,” said Knight, also an associate professor of chemistry and biochemistry and a Howard Hughes Medical Institute Early Career Scientist. “Future studies will let us understand how much of this information, both about events before death -- like diet, lifestyle and travel -- and after death can be recovered.”

In addition to Metcalf, Fierer, Knight, Carter and Parfrey, other study authors included Antonio Gonzalez, Gail Ackerman, Greg Humphrey, Mathew Gebert, Will Van Treuren, Donna Berg Lyons and Kyle Keepers from CU-Boulder, former BioFrontiers doctoral student Dan Knights from the University of Minnesota, and Yan Go and James Bullard from Pacific Biosciences in Menlo Park, Calif. Keepers participated in the study as an undergraduate while Gonzalez, now a postdoctoral researcher, was a graduate student during the study.

“There is no single forensic tool that is useful in all scenarios, as all have some degree of uncertainty,” Metcalf said. “But given our results and our experience with microbiomes, there is reason to believe we can get past some of this uncertainty and look toward this technique as a complementary method to better estimate time of death in humans.”

Gene sequencing equipment for the study included machines from Illumina of San Diego and Pacific Biosciences of Menlo Park, Calif. The Illumina data were generated at CU-Boulder in the BioFrontiers Next Generation Sequencing Facility.

To access a copy of the paper visit http://dx.doi.org/10.7554/eLife.01104[19]. For more information on the BioFrontiers Institute visit http://biofrontiers.colorado.edu[20].

## Newest club sports team reflects campus’s growing international student body[21]

[22]
The ball gets crisply knocked back and forth as players glide through drills. The CU Denver men's soccer club team is only a few weeks old, but already this blend of international talent shows promise.

The roster is akin to a United Nations gathering. Players representing Asia, the Middle East, South America and North America are uniting in an understanding and passion for this global game.

Coach Jim Rowe, leading the practice at Washington Heights Park in Lakewood, couldn't be happier.

"There's a lot of international flavor to the team," he said. "The way a kid is brought up to play in Saudi Arabia is different than a kid who grew up playing in Denver. So it can be tricky over the course of a season to get them to play the same way, all on the same page."

But he likes their prospects, especially since there are no egos. "It's the most pleasant group of players I've ever coached," said Rowe, who most recently coached soccer at the University of Maine-Fort Kent. "They just want to come out here and have a good time and work hard."

The men's soccer team is part of a burgeoning Club Sports[23] program in the Office of Student Life[24] at CU Denver. Club sports debuted with men's hockey in 2011 and has now grown to eight current teams and more planned to form soon.

The men's soccer team recently lost its opener, a 2-0 decision to the Colorado School of Mines. Not bad considering the Lynx had only three substitutes on the bench. In mid-September the club ventured out of state to compete in a tournament in Laramie, Wyo.

"We're doing a pretty good job of coming together as a team," said Josh Jarecke, who, as a 30-year-old graduate student, is the oldest player. "It's really cool to see the talents from all over the world come together here."

CU Denver is the most diverse research university in the state. Students of color represent 28 percent of the overall student body, 34 percent of undergraduates and almost 50 percent of new freshmen.

So, it's fitting that the men's soccer team represents this diversity. "Our university as a whole is really coming together, and I'm seeing a lot more community feel to the campus," Jarecke said. "We're trying to ditch that commuter campus kind of thing. These guys here come from all over."

Rowe had only been in Colorado for three days -- he and his wife just moved from Maine -- before he took the helm of CU Denver's men's soccer team. He came across the position on a Colorado Rapids supporters' Facebook page.

"You can definitely tell that he's got a knack for it," Jarecke, who previously played Division I college soccer at Nebraska, said of Rowe. "We were lucky to find him on short notice."

The team still is looking for more players. Visit the Join A Team[25] (click here[25]) page for more information. Additional contact information for each team is available under their respective Orgsync Page at the CU Denver Club Sports[26] website.

Visual arts faculty to present work at downtown gallery[27]

[28]
The UCCS Galleries of Contemporary Art will feature nine UCCS visual art faculty member artists in the downtown gallery, GOCA121, beginning Oct. 4.

The exhibit opens with a 5 p.m. to 9 p.m. Oct. 4 reception at GOCA121, 121 S. Tejon. In this themed exhibit, nine UCCS Visual Art faculty member artists – Matt Barton, Valerie Brodar, Carol Dass, Corey Drieth, Marina Eckler, Pauline Foss, Olivia Lundberg, Claire Rau and Erik Schubert – responded to the city-wide thematic CROSS-CREATIONS: gods & monsters project in drawing, photography, video installation, and mixed-media sculptural installation. The opening reception will feature gallery talks with the artists at 5 p.m. and a dance performance by community modern dance company Sansara at 7 p.m.

Refreshments will be provided and the event is free and open to the public. The exhibit will be on display through Dec. 14. Gallery hours are noon to 5 p.m. Wednesday through Saturday or by appointment. All events are free and open to the public.

CROSS-CREATIONS: gods & monsters, the second bi-annual city-wide creative project organized by UCCS GOCA and five other Colorado Springs arts and culture institutions, features contemporary art exhibits, lectures, film screenings, panel discussions, performances, and a LUNCHBEAT dance party from September – November 2013. CROSS-CREATIONS: gods & monsters will inspire dialogue around the many ideas presented – on a city-wide scale. Sparked by discussions about Mary Shelley's "Frankenstein" and the myriad creative possibilities under the theme of gods and monsters, science and ethics, good and evil, literary and film references, campy and deadly serious, the theme is ripe for creative interpretation.

CROSS-CREATIONS: gods & monsters collaborators include: the Business of Art Center, the Colorado Springs Fine Arts Center, Colorado College's IDEA Space, Marmalade at Smokebrush, PikesPeak Community College's Downtown Studio Gallery, and UCCS Galleries of Contemporary Art (GOCA121).Visit www.crosscreationscollab.com [28] for a full program schedule.

**About the artists**

**Matt Barton, assistant professor, Department of Visual and Performing Arts,** currently teaches 3D art making and is co-director of the UCCS visual art program. Following brief stints as a Chuck E. Cheese dancing rat and Victoria's Secret shop stock boy, Barton spent a year in Italy as an artist apprentice. He earned his Master's in Fine Arts in 2006 from Carnegie Mellon University.

**Valerie Brodar, associate professor, Department of Visual and Performing Arts,** received her Bachelor's of Fine Arts degree in printmaking and fiber arts from Carnegie Mellon University and her Master's in Fine Arts in time arts from the School of the Art Institute of Chicago. Her work has been shown at the Instituto Cultural Peruano Norteamericano, Miraflores, Peru; Zico House, Beirut, Lebanon; Mattress Factory, Pittsburgh; SOHO20 Chelsea, New

York.; Center on Contemporary Art, Seattle; Artemisia Gallery, Chicago; Betty Rymer Gallery, Chicago ; Gallery 2, Chicago; and The Erie Museum, Erie, Pa.

**Carol Dass, instructor, Department of Visual and Performing Arts,** was born in Oakland, Calif., raised in rural Missouri and received her bachelor's degree in art from Northwest Missouri State University. She has lived in Colorado Springs for 30 years and a UCCS photography instructor for 12 years. Dass's work has been shown nationally and is in the collections of the Denver Art Museum, the Colorado Springs Fine Arts Center and numerous private collections.

**Corey Drieth, assistant professor, Department of Visual and Performing Arts,** received undergraduate degrees in philosophy, comparative religious studies and studio art from Colorado State University and a Master's in Fine Arts in 2004 from the University of North Carolina. Prior to joining UCCS, Drieth taught studio art classes at CSU, the University of North Carolina and the University of Virginia. His work has been exhibited throughout the country, including San Francisco, Chicago, Albuquerque, New Orleans, Washington DC and New York City.

**Marina Eckler, lecturer, Department of Visual and Performing Arts,** studied letterpress printmaking and art at San Francisco State University and earned a Master's in Fine Arts from the Maine College of Art. Her work has been exhibited at the Harwood Museum in Taos, N.M., The Lab in San Francisco, the ICA Gallery in Portland, Maine, and the New York Art Book Fair. She currently teaches two-dimensional art.

**Pauline Foss, senior instructor, Department of Visual and Performing Arts**, received a Master's in Fine Arts from the Vermont College of Fine Art, a master's degree in art from Adams State College and bachelor's in art history the University of California, Davis. She has received numerous fellowships and awards, including a Colorado Excellence in the Arts Fellowship in 2002, and has exhibited her work nationally and regionally.

**Olivia Lundberg, instructor, Department of Visual and Performing Arts**, received a Master's of Fine Arts in painting from the Massachusetts College of Art & Design and a bachelor's in studio art from the University of California, Davis. She has exhibited in New York, Boston, California and Colorado.

**Claire Rau**, **senior instructor, Department of Visual and Performing Arts**, was born in Sandusky, Ohio. She completed her graduate work at the University of North Carolina, Chapel Hill, and presently teaches sculpture at UCCS. She is the recipient of several awards and residencies, continuing to build upon an extensive exhibition record in the U.S. and internationally. Rau is a founding member of The Front in New Orleans.

**Erik Schubert , instructor, Department of Visual and Performing Arts,** received a Master's of Fine Arts from Massachusetts College of Art and Design, and a Bachelor's of Fine Arts. from Columbia College, Chicago. Schubert has taught photography at MassArt, Greenfield Community College and currently teaches at UCCS. Schubert has been in several exhibitions throughout the U.S. including Boston Young Contemporaries, SPECTRA: National Photography Triennial, and was featured as the Photographic Resource Center's NEO Emerging Artist, April 2009. In 2010, Schubert was included in the "On the Road: A Legacy of Walker Evans" exhibition at the Robert Lehman Art Center.

**About Sansara Modern Dance Companies**

Sansara, a performance based Modern dance company in Colorado Springs, uses its dancer's eclectic backgrounds and training to bring politically, socially, and personally relevant works to their audience. Literally translated, "Sansara" means continuous movement through life, a concept that the company's dancers strive to convey in their work. Sansara seeks to push the envelope with thought-provoking subject matter while making dance accessible to all members of their community.

GOCA is a regional hub of contemporary art, culture, and conversation. By featuring world-class artists, hosting artist and expert talks, and offering meaningful events the galleries engage UCCS students, faculty, staff and Pikes Peak Region community members in contemporary culture and life.

For more information, contact Daisy McConnell, director dmcconne@uccs.edu[29] or 255-3504.

[More than 2,000 attend first Anschutz Block Party][30]

A large inflatable Twister game board was a popular attraction at Friday's Anschutz Block Party.

A large inflatable Twister game board was a popular attraction at Friday's Anschutz Block Party.

Jennifer Ivey, a doctoral student in rehabilitation sciences, enjoyed the chance to recharge her batteries, soak up sunshine and mingle with colleagues at Friday's first-ever Anschutz Block Party.

She was just one of some 2,000 folks -- students, faculty, staff and community members -- who reveled in the food, music and games that made the Block Party at the Anschutz Medical Campus a smashing success.

"This event is awesome. I've been looking forward to it since the posters went up," Ivey said between beanbag tosses in a game of corn hole. "We don't get many excuses to come outside and play a bit. It's also fun to be with my lab-mates out here. It's nice to be able to hang out with them and have fun, and do some team building."

Neil Krauss, director of administration, Anschutz Medical Campus, surveyed the festive scene from one end of the grassy area on the south side of Building 500. "I'm so tickled that so many people came out for the Block Party. It just goes to show what kind of community we have here. And the weather couldn't be better -- what a beautiful day."

Zack Strober, director of events, University of Colorado Denver | Anschutz Medical Campus, said the event attracted 15 food outlets -- nine food trucks and six local restaurants. The Block Party also featured 33 booths, most providing information and freebies related to health and wellness.

"I'm loving it -- it's the best thing to do on your break," said corn hole player Ashley Haight, a professional research assistant in the [Physical Therapy Program][32]. "The booths are so cool. We got so much gear."

Jason Parnes, a research assistant in the [Rocky Mountain Taste and Smell Center][33], said he enjoyed listening to the Belle Jar, which featured doctoral candidate Courtney Wilson. Other bands playing the south stage were the Delta Sonics, Dogs in the Yard and the Aurora Symphony's Brass Quartet. The Kim Robards Dance group got folks up and moving with an artistic dance performance.

Parnes also enjoyed playing a game of ladder ball with his colleagues.

"It's really great to have people out here, people from the surrounding community even, to see what's on campus," he said. "The food trucks are nice. I wish they were here every day."

Other popular attractions included a giant inflatable Twister board, volleyball, chair massage and prize wheels and giveaways.

Marks came up with the idea for a Block Party as a way to engage the community as well as give people an opportunity to network and learn about the many unique and high-quality programs on the Anschutz Medical Campus. Also, the event gave everyone a chance to get outside and have some fun.

"People work very hard here, probably harder than anyplace I've ever seen, and under tough conditions," Marks said. "This event gave them the chance to get out, relax and enjoy. I think it's important to establish traditions and break down the isolation. This is an opportunity to get to know and enjoy one another."

Volunteers surveyed partygoers about what they liked at the debut event and what they'd like to see in years to come at Block Parties. CU Denver opened the fall term last month with a successful [Block Party in downtown Denver][34].

-- Chris Casey and Marcia Neville

Weimer-led team awarded $3.6 million grant[35]

[36]
**Alan Weimer**, a CU-Boulder professor in the chemical and biological engineering department, has been awarded a three-year, $3.6 million grant from the Energy Department's Advanced Research Projects Agency to develop a new process to produce magnesium that can be used to make lightweight vehicle parts.

Weimer and his research team will use the grant to develop a new gasification process that uses concentrated solar power to produce magnesium and synthesis gas, or syngas, a precursor of synthetic gasoline. The procedure includes a novel quenching, or cooling process, to enable a gas-to-solid magnesium phase change inside of the reactor.

Current magnesium production is energy intensive and produces substantial carbon emissions, Weimer said. But the new renewable energy-powered approach to magnesium production could reduce carbon emissions and lower costs, and create a synthetic fuel, said Weimer, who also is executive director of the Colorado Center for Biorefining and Biofuels.

The award was one of 33 "breakthrough" energy projects given to government, academia and industry announced today by Cheryl Martin, deputy director of the Advanced Research Projects Agency-Energy, or ARPA-E. The $66 million in awards was split between two areas -- $32 million to develop cost-effective and energy-efficient manufacturing techniques to process and recycle metals for lightweight vehicles, and $34 million to develop advanced biocatalyst technologies that can convert natural gas to liquid fuel for transportation.

The 2013 ARPA-E award to CU-Boulder was the largest for light metal research and development and the largest award overall to a single university. "The new ARPA-E projects announced today demonstrate ARPA-E's commitment to providing critical, early-stage funding for innovative energy technologies," Martin said.

The current leading process to produce magnesium involves using electricity 24 hours a day, a method that is particularly expensive because of high-energy consumption during daylight hours, Weimer said. "Our plan is to use solar energy to power our reactor in the daytime and use electricity only at night during off-peak hours."

The new process involves the reaction of carbon and magnesium oxide that are heated to high temperatures in a hybrid solar-electrical reactor to produce magnesium vapor and carbon monoxide gas, said Weimer. While the magnesium vapor is converted into a solid metal, the carbon monoxide is combined with hydrogen produced by using excess heat recovered from the solar-electrical reactor to split water into its component parts of hydrogen and oxygen, resulting in the production of syngas that can be made into diesel fuel or gasoline.

"We are using all of the products here, not only to make magnesium, which is a high value product, but also to make fuel," said Weimer, who also is a faculty member at CU-Boulder's BioFrontiers Institute. "We anticipate that the demand for magnesium will increase as industry looks to produce lower weight, higher mileage vehicles."

Magnesium is 75 percent lighter than steel and 33 percent lighter than aluminum. By 2020, magnesium parts will allow cars and trucks to weigh 15 percent less, leading to fuel savings of 9 percent to 12 percent, according to the U.S. Automotive Materials Partnership, an industrial coalition of the Chrysler Group LLC, the Ford Motor Company and the General Motors Co.

Weimer said the ARPA-E grant will provide funding for CU-Boulder postdoctoral researchers, graduate students and undergraduates in the coming years. The Weimer research lab has been engaged in solar-thermal processing for the past 17 years and is the largest academic solar-thermal chemistry research team in the United States.

UCCS School of Public Affairs, College of Business have new faculty members[37]

New faculty members have joined UCCS in the School of Public Affairs and the College of Business. They are:

[38]
**Henriikka Weir**, assistant professor, School of Public Affairs: Weir previously was an instructor in the criminology program at the University of Texas at Dallas, a graduate teaching assistant at UT-Dallas and a police officer and investigator for the Bedford (Texas) Police Department. She earned bachelor's, master's and doctoral degrees from UT-Dallas.

[39]
**Robert Wonnett**, assistant clinical professor, School of Public Affairs: Wonnett is a long-serving UCCS staff member, serving most recently as program adviser for the Student Affairs in Higher Education program, vice chancellor for student success and dean of students. He earned bachelor's and master's degrees from the University of Colorado Boulder, master's and doctoral degrees from CU Denver and a law degree from the University of Denver.

[40]
**Joel Worley**, instructor, College of Business: Worley previously was dean of the College of Business at Northwestern State University of Louisiana. He also held faculty positions at Northwestern State University and at Radford University. He earned a bachelor's and master's degree from Stephen F. Austin State University and doctoral degree from Virginia Polytechnic Institute and State University.

Dropping names ...[41]

Winters

**Marcus Winters**, assistant professor in the College of Education at UCCS, along with Joshua Cowen of the University of Kentucky, recently published "Who Would Stay, Who Would Stay, Who Would Be Dismissed? An Empirical Consideration of Value-Added Teacher Retention Policies" in the August/September edition of "Educational Researcher," an education policy journal. … **Edgar Cota-Torres**, associate professor in the Department of Languages and Cultures at UCCS, will be the keynote speaker at the Fort Carson National Hispanic Heritage Celebration. The celebration is scheduled for Monday at the Elkhorn Conference Center at Fort Carson.

In memoriam[43]

Names of current and former University of Colorado faculty and staff who have died in recent weeks. List compiled by Employee Services.

**UCCS**
**Margaret E. Mistry,** 74, senior instructor. Sept. 14, 2013. Click here[44] for an obituary and more information in UCCS Communique. **Stanley Powell,** 63, equipment operator II. Sept. 12, 2013.

Understand your free, discounted health tests with doctor's help[45]

[46]

From the Be Colorado Wellness Team:

Dr. Rich Penaloza gets it: Many people just don't like going to the doctor.

He also knows each minute you avoid seeing your doctor, you may unknowingly be feeding or neglecting a very preventable disease or ailment. It can be easy to detect with quick blood pressure, cholesterol and weight tests, he says. A seasonal flu vaccination can't hurt, either.

And if you could save yourself about $250 to take other important tests at discounted prices, wouldn't you?

These are all things you can get completed within minutes at Be Colorado's fall 2013 biometric health screenings. These tests and vaccinations are open to you and your covered spouse or partner courtesy the CU Health Plan, of which Dr. Penaloza is an associate medical director.

You can drop in for a flu vaccination only, make an appointment for the full screening and flu shot, or take our discounted tests, which include blood typing, a screening for Celiac disease and measurements of blood count, kidney and liver function, and more.

"If you go in and order that in our clinic, you're going to get a $250 bill; it's going to fill up your whole co-pay," Penaloza says. "You can really get a great amount of things for a very inexpensive price here."

Register for your health screening today[46], and learn what your free and discounted tests measure[47], and what your results mean.

Faculty Awards at CU-Boulder Fall Convocation[48]

On Oct. 4, CU-Boulder will host its eighth annual Fall Convocation: A Celebration of Faculty and Student Achievement. It will be held in conjunction with this year's Family Weekend. Events include speakers throughout the morning and an awards ceremony followed by a reception.

The awards ceremony, recognizing Provost's Achievement Award winners and recipients of tenure and promotion, will take place at 1:30 p.m. in the Old Main Chapel.

For more information, contact Faculty Affairs, 303-492-5491, or https://facultyaffairs.colorado.edu/welcome/eighth-annual-fall-convocation[49].

Save the date: 12th Annual CU Women Succeeding professional development symposium[50]

[51]
The 12th Annual CU Women Succeeding professional development symposium has been announced for Feb. 27-28, 2014, at the CU Anschutz Medical Campus.

The theme is “Empowerment for Excellence,” and features a keynote address by Lilly Marks, vice president for health affairs and executive vice chancellor of the Anschutz Medical Campus.

Registration fee is $25. More information at: http://www.cu.edu/FacultyCouncil/womens-symposium[52]

Newest system TV spots feature faces of CU – on camera, behind scenes[53]

When the Colorado Buffaloes catch a breather during televised football games this fall — ditto for the basketball team, right into spring — TV viewers may see the work of a top-notch team from CU.

The newest TV commercials promoting the University of Colorado system boast the following campus ties:
Three CU Nobel laureates are featured The musical score was written and performed by CU students All students pictured are CU students The voiceovers are provided by CU students The director and the director of photography are CU alumni
Megan Knapp, left, plays the cello while Pablo Barron, director of photography for Futuristic films — and a CU-Boulder graduate — films her for a CU system TV commercial promoting the university. The spot will air during televised CU football and basketball games. (Photo: Clay Evans/University of Colorado)

The TV spots, which focus on a theme of “Create Something Extraordinary,” will air at least once during all televised CU football games, and during CU basketball games televised by the Pac-12 network. Production was coordinated by University Relations in the Office of the President.

“The message is, if you come here, your education and experience are going to prepare you to truly create something extraordinary with your life,” says T.J. Rhine of Boulder-based Greenhouse Partners, which crafted the concept.

The commercials feature an inspirational voiceover and images illustrating the diversity of experience and excellence at the university, from Nobel Prize-winning faculty to musicians from the College of Music. Two composition graduate students, Daniel Brandt and Hugh Lobel, wrote the score.

“We were sort of more interested in commercial music a bit more than other students,” says Brandt, 25, in the master’s degree program in composition. “We spoke with T.J. and got the impression he wanted something minimalistic.”

For research, Brandt went online and listened to musical scores for iPod and iPhone advertisements — “Then I stopped listening and started writing.” Rhine liked one of the tunes and Brandt worked with him to refine it. His score will accompany one version of the 30-second commercial and Lobel’s the other.

“They worked really hard to get the performance down to exactly 30 seconds,” says Daniel Kellogg, associate professor of composition, who coordinated the college’s participation in the project.

Having the potential of millions of ears hearing his work is, Brandt says, “pretty cool. … You go to a new-music concert and hopefully the people are nice enough to applaud. … Now it’s interesting think that millions of people may be watching or listening during a football game and I wouldn’t even know.”

Making a half-minute commercial takes a lot more time and effort than many people might imagine.

The four performers — Marisa Ishikawa on violin, Trevor Martin and Megan Knapp on cello, and Peter Mathys on piano — spent several hours in makeup and playing onstage at Grusin Music Hall on July 18 while a dozen people from Denver-based Futuristic Productions arranged complex lighting and shot video. The performers had previously recorded the original scores and were given instructions for the filming.

“The crew wanted them to play something they could play straight for 10 minutes,” Kellogg says.

Pachelbel’s “Canon in D” it was, then. The performers played those notes over and over while the crew tinkered with lighting, shot footage from the seats and eventually captured close-ups with a camera on a shoulder-carried boom.

“This was a fun chance for our students to collaborate on some music for a film and do something completely different,” he says. “They worked hard on an unusual project that will really represent the College of Music well.”

**Links**
[1] https://connections.cu.edu/stories/cu-bouldernist-physicist-ana-maria-rey-wins-macarthur-%E2%80%98genius%E2%80%99-grant[2] https://connections.cu.edu/file/reymacaurtherpng[3] http://ucolorado.pr-optout.com/Tracking.aspx?Data=HHL%3d%3e136A%26JDG%3c95%3a473%3b%26SDG%3c90%3a.&RE=MC&RI=4100720&Preview=False&DistributionActionID=8066&Action=Follow+Link[4] http://ucolorado.pr-optout.com/Tracking.aspx?Data=HHL%3d%3e136A%26JDG%3c95%3a473%3b%26SDG%3c90%3a.&RE=MC&RI=4100720&Preview=False&DistributionActionID=8065&Action=Follow+Link[5] https://connections.cu.edu/stories/five-questions-tim-chamillard[6] https://connections.cu.edu/file/5q-chamillardpng[7] https://connections.cu.edu/stories/guide-resources-faculty-staff-affected-floods[8] https://connections.cu.edu/sites/default/files/wp-content/uploads/2013/09/flood-sidebar.png[9] http://www.smartaboutmoney.org/Portals/0/ResourceCenter/DisasterRecovery-GuidetoFinIssues.pdf[10] htt
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http://www.ucdenver.edu/academics/colleges/medicalschool/centers/tastesmell/Pages/tastesmell.aspx[34] http://www.ucdenver.edu/about/newsroom/newsreleases/Pages/Downtown-Campus-boogies-into-new-year-at-Block-Party.aspx[35]
https://connections.cu.edu/people/weimer-led-team-awarded-36-million-grant[36]
https://connections.cu.edu/people/weimer-led-team-awarded-3-6-million-grant/p_weimer[37]
https://connections.cu.edu/people/uccs-school-public-affairs-college-business-have-new-faculty-members[38]
https://connections.cu.edu/file/pweirpng[39] https://connections.cu.edu/file/pwonnettpng[40]
https://connections.cu.edu/file/pworleypng[41] https://connections.cu.edu/people/dropping-names-74[42]
https://connections.cu.edu/file/p-dnwinterspng[43] https://connections.cu.edu/people/memoriam-9[44]
http://communique.uccs.edu/?p=11964[45] https://connections.cu.edu/stories/understand-your-free-discounted-health-tests-doctor%E2%80%99s-help[46] http://becolorado.org/programs/biometric-screenings/[47]
http://becolorado.org/programs/biometric-screening-tests[48] https://connections.cu.edu/stories/faculty-awards-cu-boulder-fall-convocation[49] https://facultyaffairs.colorado.edu/welcome/eighth-annual-fall-convocation[50]
https://connections.cu.edu/stories/save-date-12th-annual-cu-women-succeeding-professional-development-symposium[51] http://www.cu.edu/FacultyCouncil/womens-symposium/[52] https://www.cu.edu/FacultyCouncil/womens-symposium/index.html[53] https://connections.cu.edu/stories/newest-system-tv-spots-feature-faces-cu-%E2%80%93-camera-behind-scenes[54] https://connections.cu.edu/file/commercialpng