News

Largest freshman class descends on campus

This year’s seniors suddenly found themselves outnumbered by throngs of freshmen who descended on campus.

In the fall CU welcomed its largest freshman class ever, with 5,617 new first-time students, and minority freshmen enrollment leaped 18 percent over last year (see page 18).

Outdoing 2003’s record of 5,571 freshmen, this year’s class surprised admissions officers who anticipated a smaller number of students, both in and out of state, to enroll. The numbers sent the housing department scrambling to find temporary space for them in everything from dorm study rooms to social lounges.

Chancellor Bud Peterson noted the size of the class was “one more sign of the tremendous positive momentum overtaking this campus.”

International student enrollment increased by 10 percent from 912 last year to 1,003, led by a 60 percent increase in international graduate-level students, from 127 to 203. Larry Bell, director of the Office of International Education, says it’s difficult to attribute the increase to one factor, noting U.S. embassies have worked hard to ensure the visa process is less of a problem for bonafide students.

“Among other changes, our office has worked hard with current international students to make sure they ‘talk up CU-Boulder’ among their friends and relatives when they return home.”

Despite these increases, CU’s overall enrollment increased just 1 percent to 28,942, in part due to fewer transfer students enrolling, as well as to the small size of the classes of 2004 and 2005.

Researchers find possible answer to Big Bang mystery

Since the 1970s astrophysicists have been plagued by the mystery of the varying levels of a heavy form of hydrogen created moments after the Big Bang in the Milky Way.

CU astrophysicist Jeff Linsky and an international team of scientists believe they may have an answer.

Data gathered from NASA’s Ultraviolet Spectroscopic Explorer satellite reveals that the heavy form of hydrogen — deuterium — is binding to tiny, interstellar dust grains, transforming it from an easily detectable gas to an unobservable solid form.

Amounts of interstellar dust and deuterium seem to be inversely proportional, according to Linsky.

Not so, Linsky says, estimating present-day deuterium levels at less than 15 percent below the primordial values.

Amounts of deuterium in the universe is “pure” and serves as a tracer for star creation and galaxy formation.

Deuterium was thought to burn and be lost forever during star formation, leading scientists to alter theories about star and galaxy formation.

“The answer we found is as unsettling as it is exciting,” says Linsky, noting it could radically alter theories about star and galaxy formation.

Where there are high concentrations of interstellar dust, there are lower concentrations of deuterium and vice versa.

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Margaret Murnane and Henry Kapteyn are world leaders in the field of experimental, ultrafast optical science. Their work has applications for faster microchips, biological imaging and other fields.

Dynamic duo on way to finding chemistry’s holy grail

Two CU scientists have come one step closer to uncovering one of the holy grails in chemistry — understanding how chemical bonds are made and broken.

Using ultrafast lasers, CU scientists and married couple Margaret Murnane and Henry Kapteyn, along with their team, have developed a method to observe the motion of atoms during chemical reactions.

“...an important step in the exploration of the molecular world,” Kapteyn says. “If we can understand exactly what is going on in a chemical reaction, our chances of manipulating it in a desired way are greatly improved.” He adds it could take years of experimentation to determine how much can be learned about chemical reactions at the molecular level.

Like playing a bizarre video game, the team used the electric field from an intense laser to pluck electrons away from a molecule and then slam them back into the same molecule. The highly energetic electrons scatter from the molecule and emit bright bursts of X-rays that are detected and measured.

The process is like a strobe light that freezes the positions of the atomic bonds like the famous image of a bullet striking an apple, explained physicist Andrea Wuest, a postdoctoral researcher and team member.

CU fares well in latest rankings

For the fourth straight year, CU was ranked the 11th best public university in the world by the Institute for Higher Education at Jiao Tong University in China. Five hundred international universities were ranked in the 2006 survey.

Ranking criteria included Nobel Prizes and Fields Medals, the highest scientific awards for mathematicians, received by faculty and alumni, along with the number of frequently cited researchers.

CU also ranked 34th among the nation’s public universities offering doctoral degrees in the U.S. News & World Report’s 2007 undergraduate rankings.

In the ranking of all doctoral universities, both public and private, CU tied for 77th with three other schools, while CU’s engineering college tied for 34th. CU was ranked based on academic peer assessment, graduation and retention rates, faculty resources, student selectivity, financial resources and alumni giving.

In the Diverse Issues in Higher Education magazine ranking, which looked at the number of degrees awarded to racial groups, CU ranked 59th overall for American Indian students, 64th for Asian American baccalaureates and 76th for Hispanic baccalaureates. For awarding degrees to Hispanic college students, Hispanic Outlook in Higher Education magazine listed CU as 76th for bachelor’s degrees and 68th for doctoral degrees.

Boulder professors also pulled in an impressive amount of research money this year. CU-Boulder’s 2006 total of sponsored research awards was $256.5 million, with nearly two-thirds of the funds coming from four of the largest federal agencies: the Departments of Defense, Energy, Education and the Interior.

Of big bad cats and prairie rats

When we last left the noble prairie dog in 2005, the Black Death was raging through his Boulder colonies like a prairie fire, and the Grim Reaper was going hole to hole and calling “bring out your dead.”

That was then. These days Boulder’s critters du jour are cats.

Big yellow cats.

Of late the noble mountain lion has taken to coming down from the hills for a night on the town.

Starting with dinner.

Dinner typically begins with an appetizer of Chien Tartar or Petit Chat, followed by an entrée of fresh venison, all washed down with a fine vintage from the kids’ wading pool. It’s not uncommon for the happy visitor to cache the leftovers under a bush and repair to the nearest tree for a catnap.

Boulder’s preferred tactic for dealing with such poor socialization and bad table manners is “catch and release.”

The first cat caught napping was let out of the bag in an undisclosed location and it hasn’t come back. And we haven’t heard a word from Grand County. So far.

Anyway, back to prairie dogs and their Black Death problem. They got over it and got on with their lives — at the Thomas Watson ball fields next to the IBM plant. Set up housekeeping right in the infield.

Bad decision.

“This time the little rats have gone too far,” said the City Fathers and Mothers (in so many words). “What are our options?”

“Fuel air explosives,” came the reply.

“How about catch and release — with extreme prejudice?” came the reply.

“They’re flushed out of their holes, read their Miranda rights and sent to Club Fed.”

“Club Fed?”

“The Federal Black Footed Ferret Recovery Center. It uses them to teach the ferrets how to hunt again because prairie dogs are their favorite food.”

“It’ll be a far, far better thing that they do than they have ever done,” said the City Moms and Pops (in so many words). “And besides, previous polling shows 70 percent of the voters approve.”

The moral of the story is don’t mess with the softball lobby, no matter how damned cute you are.

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Gearing up for difficult mountain rescues

During the summer of 1956 Boulder-based Rocky Mountain Rescue Group members received a call regarding a midair collision between United Airlines and TWA jets over the eastern edge of the Grand Canyon.

All 128 people on both planes tragically died, but the group traveled to the Grand Canyon and developed a cable lowering system to recover bodies and other items.

That lowering system was discontinued five years ago due to training and maintenance issues, but within the past year CU students have teamed up with the Rocky Mountain Rescue Group to create a new lowering system to be used for long descents in mountain rescues and in fire zones when normal ropes may not be appropriate.

The project is part of the Industry/University Cooperative Project Center, where CU engineering students work on their senior design projects in tandem with industry partners. The goal is for students to gain real-world design and industry experience while creating functional products for businesses, government agencies and other organizations.

From start to finish, the lowering system took about nine months to design and develop. This past summer and fall Rocky Mountain Rescue members field-tested the new system. When field tests are completed, the group will train their volunteers how to use it. The product will not be sold but can be constructed by other rescue groups.

“In fire zones cable may be a necessity due to the potential for nylon rope to melt,” says rescue group member Steve Dundorf (CivEng’97, MS’01), who worked with the CU students. “I wouldn’t say mountain rescues in fire zones are common, but there is the chance.”

The Rocky Mountain Rescue Group project is just one of more than 20 that have been completed through the Industry/University Cooperative Project Center. For instance, students worked on an improved technique for drying the inside of aluminum cans for higher speed production during manufacturing. Others investigated the possibility of creating a new passive system in Chautauqua Park in Boulder.

CU joins arts, technology and media together with video cameras, microphones, giant screens and televisions in the new ATLAS Center. There’s also a coffee shop for students who need a break from all the state-of-the-art gadgets.

ATLAS debuts high-tech learning

Why take piano lessons when you can play a piano remotely by waving your fingers in the air or speaking into a microphone?

The answer lies in a black box located inside CU’s newest building, the $31 million Alliance for Technology, Learning and Society Center. The 2,700-square-foot black box performance space looks, well, just as its name implies. But the studio provides mind-boggling audio and video projection capabilities in a building that began serving an estimated 6,000 students each semester from all different disciplines.

For instance, the voice of a performer singing into a microphone can be analyzed by a computer, which then plays the “melody” of her voice on the piano. A dancer waving her hand in front of a camera can alter the lighting or trigger a computer-controlled cascade of piano notes.

The result in the black box, as well as in the building’s cutting-edge film screening room and production studio, is synergy among technology, media and the arts. In ATLAS, which lies to the east of Sibell Wolle Fine Arts, television screens on the walls greet visitors in the entrance way, showcasing classrooms, revealing students watching films, practicing dance routines and taping news broadcast shows.

This fall journalism students said goodbye to their cramped broadcast studio and rickety, 1960s-era broadcast equipment and moved into ATLAS’ 1,000-square-foot production music recording studio.

It’s night and day compared to the previous facilities in the stadium, which were only 450 square feet. Journalism professors believe such upgrades as having a soundproofed studio and cutting-edge equipment will positively impact student recruitment, as well as give students a leg up when it comes to preparing audition tapes for job interviews.

“I would think it will help me find a job since I’ll be working with equipment you use in the real world,” says Crane Lemon, a senior majoring in broadcast news.
An Engineers Without Borders team from CU demonstrates a water purification system they installed with the help of the villagers of Muramba, Rwanda.

Students help Rwandans BYO clean H₂O

Villagers in Muramba, Rwanda, are able to enjoy up to 7,000 liters of safe water for everyday use, thanks to the CU-Boulder Engineers Without Borders-USA team.

The water purification system, dubbed the “Bring Your Own Water” system, delivers clean drinking water to the entire community through a combination of previously proven water purification technologies. The system was installed last summer by team members of the non-profit organization. It consists of a gravity-fed settling tank, rapid sand filter and solar-powered UV sanitation light.

The students faced challenges with Muramba’s badly contaminated water, mountainous landscape and poor population but came up with an innovative combination of treatment technologies.

Besides building the water system during the team’s five-week visit, members worked with students from Kigali Science and Technology University to install a family-scale demonstration biogas reactor, which captures methane from animal waste to burn for cooking needs. They also took steps toward installing an ultraviolet sanitation light on the main water supply line for Mugonero Hospital.

The “Bring Your Own Water” system is the latest in a series of new systems engineered by the CU-Boulder team and installed with the help of local partners in Rwanda. During the last two and a half years, the team has repaired Muramba’s 75-year-old gravity-fed water system, built two rainwater catchment systems to enhance water supply and installed solar-powered lighting in a clinic, hospital and school.

Learn more about Boulder’s Engineers without Borders at http://ceae.colorado.edu/ewb/.

Writing is good for you, your grades, your self-esteem

A 15-minute writing exercise reduced the achievement gap between African-American and Caucasian students by 40 percent over a semester, according to a study led by CU psychology professor Geoffrey Cohen and published in the Sept. 1 edition of the journal Science.

Cohen’s research was based on findings that many African-American students experience chronic stress in school from negative stereotypes portraying them as less intelligent than their Caucasian peers. This stereotype leads to decreased academic performance, according to Cohen, and his research studied what effects an exercise in self-affirmation could have in raising students’ grades.

The research included African-American and white seventh-grade students at a Northeastern U.S. middle school, in which some African-American students wrote about their most important values on the first day of school. The study showed that students who participated in the writing exercise earned much higher grades at the end of the three-month term than students who didn’t.

Results of the study conducted in 2003 and 2004 indicate writing down important values allows students to reaffirm that they are good people and helps them fight stress arising from negative stereotypes, Cohen said.

Cohen’s findings echo 15 years of research that affirmations can have powerful effects. That one writing exercise could have such an enduring effect surprised some researchers.

Cohen and his team hope to test how the exercises can be used at other schools. They also plan to examine how to make the self-affirmation exercises even more effective.

“These are the small things that teachers can do that can change a life,” Cohen told The Denver Post.

What makes you think you’re a brainiac?

Next time you sit in front of your computer, take a moment to admire its processing abilities. After all, there are some striking similarities between it and your brain, according to CU psychology professor Randall O’Reilly.

“My work comes out of a tradition that says people’s brains are nothing like computers. Now all of a sudden as we look at them, in fact, in a certain respect they are like computers,” O’Reilly says.

While brains as a whole tend to operate more like social networks than computers, the prefrontal cortex, involved in decision making and problem solving, mimics a digital computer, O’Reilly says. Digital computers operate by turning electrical signals into binary “on and off” states and flexibly manipulating these states by using switches.

Similarly, neurons in the prefrontal cortex have two states — on or off — and the basal ganglia is basically a big switch that allows you to turn on and off different parts of the prefrontal cortex. As a result, these computerlike functions help the brain become more flexible in processing symbolic and new information.
Giant umbrella boldly assists search for habitable planets

Some people use umbrellas to block sunlight, but professor Webster Cash is taking the idea a giant step farther. He wants to launch into space a daisy-shaped umbrella he'd like to float between 6,000 and 15,000 miles away and the two would go into orbit one million miles apart. The umbrella is designed to examine every phase of space history, could detect the faint light of planets, and might help find distant planets.

Cash thinks his starshade would aid scientists in finding more planets because stars are about 10 billion times brighter than their planets. The 35-meter diameter starshade would block the glare of a distant star so the James Webb Space Telescope, designed to examine every phase of space history, could detect the faint light of planets.

NASA is currently considering a $400 million mission that would launch the fueled starshade in 2013 when the Webb telescope is scheduled for takeoff. Both would go into orbit one million miles away and the two would float between 6,000 and 15,000 miles apart.

About 5 percent of the space telescope's time would be devoted to planet hunting with help from the starshade.

The hunt to find more planets became invigorated after another CU study determined more than one-third of the giant planet systems recently detected outside Earth's solar system may harbor Earthlike planets.

The study, co-authored with researchers at Penn State and NASA, focuses on a type of planetary system that contains gas giants dubbed “Hot Jupiters.” These “Hot Jupiters” are believed to have migrated extraordinarily close to their parent stars as the planetary systems were forming, causing icy orbits to spiral inward, potentially creating oceans several miles deep within the fledgling planets.

Prior to the study, it was assumed that as “Hot Jupiters” moved, they caused all surrounding material to be ejected from the system. New simulations run over eight months on more than 12 computers indicated otherwise, says CU researcher Sean Raymond.

“These gas giants cause quite a ruckus,” Raymond says, noting the planets are possibly habitable.

Disease-detecting instruments, high-capacity wireless technology and a drug to fight the side effects of chemotherapy are just a few of the impressive inventions rolling out CU’s Office of Technology Transfer.

Some have become so successful they helped the office bring in $21.7 million in royalty revenue during the 2005 fiscal year, up from $5.8 million the year earlier. Even so, many have never heard of the tech transfer office, which identifies, protects, patents and licenses ideas and technologies to the business world.

“It’s one thing to have an entrepreneurial business community,” David Allen, associate vice president for technology transfer, told the Daily Camera. “It’s another thing to know how to connect to it.”

The tech transfer office discovers technologies largely through communication with faculty members, but an idea has to meet three criteria. Is the invention patentable? Is it technologically feasible? Is it commercially viable? If “yes” is the answer to all three questions, the Boulder Innovation Center, among others, joins in to link the inventor with the business community — a group that includes everything from venture capitalists and bankers to accountants and attorneys.

Even CU students get involved by providing such services as legal assistance, business plans and determining market feasibility. Collaboration is key, Allen says, and students who are involved get real world experience.

“There’s that other carrot out there — the potential to be involved in a startup right out of school,” Eric Grice, a former technology transfer intern who works at the Boulder Innovation Center, told the Daily Camera. “That’s huge.”

Since 1994 more than 60 companies have been created based on CU inventions.

One example is Boulder’s CDM Optics, which develops wavefront coding technology that improves digital imaging in such things as microscopy, bar codes and PC cameras.

Another is SomaLogic, a Boulder-based biotech company, which is developing disease-diagnosing products.

Last year the tech office licensed 59 technologies discovered at CU during the year.

Technology discovered at CU turned into a viable business for chemist Rick Remington at RxKinetix Inc. CU’s Office of Technology Transfer helped the company become commercially viable.

Grade inflation?

CU student government leaders rejected in late September a proposal by President Hank Brown to include more information than a simple letter grade on student transcripts.

The proposal, initiated to counter a grade-inflation trend at CU, included four options aimed at better measuring students’ academic performances.

Brown’s four-part plan included providing numerical class rank, presenting grade-point average and percentile, listing the average class grade for every course taken and allowing students to request their class standing or percentile ranking on their GPAs.

From 1993 to 2004, the average grade-point average at CU rose from 2.87 to 2.99. The number of students who graduated with honors because of high grades increased accordingly, from 6.2 percent to 9.4.

The four-part plan would have allowed employers and graduate schools to better understand what students’ grades mean, Brown said.

In response to Brown’s concerns regarding grade inflation, a Boulder Faculty Assembly committee opined that putting elements such as class rank on student transcripts would not effectively improve academic rigor and found it “worrisome” the recommendations came from the president rather than the faculty.

“I think that we need to make sure that the faculty are challenged to keep academic rigor high,” Chancellor Bud Peterson told regents. “We need to give the faculty the opportunity to think about and discuss these issues before we make changes in policy.”

The issue was still on the table at press time.
Cranking out scholarships at Buffalo Bicycle Classic

Sweating for scholarships was the mantra Sept. 10 as more than 2,100 cyclists hit the roads in Boulder for the fourth annual TIAA-CREF Buffalo Bicycle Classic.

To raise funds for arts and sciences student scholarships, participants chose from five rides covering 13, 35, 50, 70 or 100 miles. More than 1,000 cyclists chose the challenging “century” ride, a 100-mile trek to Horsetooth Reservoir near Fort Collins and back. A younger contingent and families inaugurated the 13-mile “Little Buffalo” course around Boulder. All rides began and ended on campus.

The event is the brainchild of Arts and Sciences Dean Todd Gleeson, an avid cyclist, and his cycling buddy Woody Eaton (DistSt’62), a donor for the campus’s Eaton Humanities Building. Gleeson and Eaton recruited the help of local CU loyalists Frank Banta (EPOP’72) and Gail Mock — both longtime supporters of the college and cycling enthusiasts with experience in organizing rides.

“The four of us met several times and decided we could organize a successful event that would be fun for riders of all levels and would raise both friends and funds for the college,” Gleeson says. The idea for the fund-raising ride wouldn’t have become a reality without the organizational help of university alumni and friends, Gleeson says. “They rallied the support of Boulder and Denver bike shops and the business community and have actively promoted the event.”

Each year the Classic grows in popularity and has become an integral part of the local event landscape. The March 2006 issue of Bicycling Magazine awarded it first place for medium-sized cities in the “Cool Event” category.

The event pulls in some cool cash, too. Anticipated revenue of more than $200,000 is expected this fall after expenses. A broad host of sponsors, including the CU Foundation, covered a significant portion of the event costs, enabling entry fees to go directly to fund scholarships. The proceeds go to $2,000 scholarships awarded to Colorado residents with 3.0 grade-point averages and financial need.

In the first three years $300,000 has been given in scholarships. The success of this year’s event means that another 100 students will receive aid to pursue their education.

“The best part is awarding the scholarships, which come as a surprise. Students don’t apply but are chosen based on financial aid records,” Gleeson says. “They’re just thrilled.”

Learning the ropes at CU, in Boulder

By G.P. “Bud” Peterson

As a relatively new arrival, I have spent considerable time trying to learn as much as possible about what makes this university so special. I have greatly enjoyed the process of getting to know some of the students, faculty, alumni and staff at a plethora of events.

I have especially enjoyed the opportunity to hear from many of you at the Alumni Association board gatherings, meetings with various faculty groups, meetings of the CU Foundation board, pep rallies on the Pearl Street Mall and the grand openings of our marvelous new facilities, the Wolf Law Building and the ATLAS Center. My wife Val has joined me on many occasions. She worked with curators to have some artwork on loan from the CU Art Museum’s Colorado Collection displayed in the University Residence.

As part of our ongoing efforts to enhance the relationship between CU-Boulder and the local community, I have met with many townspeople, including the Boulder City Council. When Deputy Mayor Suzy Ageton (PhD Soc’74, Law’88) suggested I ride along with the local police, I made arrangements to spend two overnight shifts, one with the Boulder police and one with the CU police.

Although Val and I have four children in their 20s, I was quite surprised by the variety of situations the officers encountered. What made the greatest impression on me was the tremendous sense of pride with which all of the officers approach their duties. While you might think my presence influenced their behavior, it was clear both of these organizations are comprised of dedicated individuals committed to the safety and welfare of all members of the Boulder community.

For instance, around midnight campus police stopped a woman who was driving erratically. Officers discovered she was not intoxicated but emotionally distraught because of an argument with her boyfriend. They did not arrest her, but instead offered to call a friend and made sure she could get home safely.

In another incident, city police were invited to conduct a “preparty walk through” at a fraternity house. They advised the party hosts on how to maintain control, keep uninhibited guests out and monitor alcohol consumption. It was an amazing scene of collaboration and cooperation.

Later the officers closed down a different fraternity party when an uninvited guest threw a bottle at the officers. The situation was handled skillfully.

While the officers faced a number of difficult situations they were, in every case, calm, well-prepared, extremely professional and exhibited remarkably good judgment. I can only hope that the law enforcement entities that are watching over our four children are as well trained, professional and caring as those here in Boulder.

Chancellor Bud Peterson came to CU-Boulder July 15 after six years as provost at Rensselaer Polytechnic Institute in New York. You may contact him by e-mail at chanchat@spot.colorado.edu.

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