Five questions for Thomas Ayres[1]
[2]

Stargazing takes on an entirely different meaning for Thomas Ayres, who looks beyond the beauty of the night sky, focusing instead on the “invisible” ultraviolet and X-ray light emitted by stars in our galaxy.

His early passion was fueled by his father, a science fiction buff who shared stories of alien worlds, and by an uncle, a science teacher with a love of astronomy. At a young age, Ayres wanted to become director of the “Lunar Observatory,” a facility, he admits with a touch of sadness, that still is only a dream.
[3]

Now, as a senior researcher at the Center for Astrophysics and Space Astronomy (CASA) at CU Boulder, his interests are sparked by objects trillions of miles away, with decidedly more pizzazz than our airless, lifeless moon. His studies highlight one piece of the puzzle of the sun’s “space weather,” which can affect planet Earth directly and has often more extreme counterparts in other planet-hosting star systems.

His contributions to the campus include the Scale Model Solar System, an exhibit showing the relative distances and sizes of the planets in our solar system that commemorates the astronauts killed in the space shuttle Challenger explosion in 1986.

1. How did you come to be at CU?

I came to Boulder in the fall of 1971 to enter the graduate program in CU’s physics department after finishing at Harvard College and spending a summer internship at Kitt Peak Observatory in Tucson.

I hadn’t been to Boulder before, and my first view of Boulder Valley from the overlook on the turnpike was unforgettable. A perk of being a grad student in physics was a key to the Reading Room at the top of Duane Tower, which has a commanding view of Folsom Field. I had the privilege of watching, from that lofty perch, CU’s football team rise to No. 3 in the nation that fall, bested only by arch rivals No. 1 Nebraska and No. 2 Oklahoma. (Remember the “wishbone formation”?) It was hard to believe that the top three teams in the country all were from the same conference, the then (not-so-big) Big Eight.

I left CU with a Ph.D. in astrophysics in 1975 but returned a few years later after a stint as a postdoc at Harvard. The lure of the rapidly growing space astronomy program at CU, and perhaps a touch of Chief Niwot’s curse, brought me back. I worked in JILA for a couple of years with my Ph.D. adviser, Jeffrey Linsky, on an early UV space observatory called the International Ultraviolet Explorer. Then, in 1980, I moved over to the Laboratory for Atmospheric and Space Physics (LASP) into a solar UV instrumentation program. In 1985, I and several astronomy colleagues from LASP formed CASA, which is dedicated to studying deep space phenomena beyond our solar system.

2. Some of your research deals with measuring ultraviolet emissions of stars. How are these emissions “seen” and what stars are you studying?

The ultraviolet is beyond the bluest colors that human eyes can see, and, in fact, mostly is blocked by ozone absorption in our Earth’s atmosphere (otherwise, think very bad sunburns). Astronomers must send their instruments beyond the atmosphere into space to record the ultraviolet radiation of stars and other celestial objects.

An important type of instrument is the spectrograph, which works something like a prism to spread out the UV into – to our eyes – an invisible rainbow, which then is captured by special cameras sensitive to that light. The allure of the UV is that it traces high temperatures in cosmic environments. Such hot conditions (five to 100 times the sun’s already toasty 6,000 Kelvin surface temperature) occur naturally on so-called “hot stars,” which are much more massive, luminous, and warmer than the sun and surprisingly also on the sun itself. The sun is a “cool star,” which nonetheless has high-altitude atmospheric layers (something like the Earth’s ionosphere) that can be strongly disturbed by sunspots, vast magnetic “storms” on the solar surface. This magnetic activity creates very hot pockets of gas in the sun’s corona and inspires a variety of explosive phenomena that reach far out into the solar system, creating “space

weather."

These effects, in extreme cases, can be dangerous to our high-technology civilization on Earth. Consequently, the Space Weather Prediction Center (SWPC, pronounced "SwipSee") at the National Oceanic and Atmospheric Administration (NOAA) in Boulder, keeps a sharp lookout for such events, and issues warnings when trouble is on the way.

Ultraviolet studies of the sun and other stars are one piece of the larger puzzle to understand stellar magnetic activity, partly for the practical reason to improve space weather predictions, and partly to establish the basic physical underpinnings of the phenomena, which are widespread in the cosmos.

A big advantage in the exploration of stellar ultraviolet properties is to examine nearby stars. That is because the closer stars are brighter, while more distant stars are dimmer, so the nearest stars provide the easiest targets. The two most popular UV instruments today both are on Hubble Space Telescope (HST), and the newest one, installed in 2009, was designed at CASA. It's called Cosmic Origins Spectrograph (COS for short) and was built in Boulder at Ball Aerospace under the direction of principal investigator Jim Green and his CASA team.

COS was designed to achieve the best possible sensitivity, and, in fact, is so sensitive that the nearest stars are too bright for it. The other HST instrument, Space Telescope Imaging Spectrograph (STIS), also built in Boulder, installed in 1997 and refurbished in 2009, is just right for the nearest stars. The closest of the "nearby" stars is the famous Alpha Centauri, only four light years away. Only, in this case, is relative: With our most advanced propulsion systems, a space probe from Earth would take more than 10,000 years to make the trip. The folks in the sci-fi film "Avatar" made the crossing in only six years. (I would love to know that technology.)

Alpha Centauri is a hierarchical-triple system: two heavier stars orbiting each other relatively close together (about 10 times the separation between the sun and Earth), and a lighter companion revolving around the central pair at a great distance (about 10,000 times the Sun-Earth separation). The two bigger stars, A and B, are very similar to our sun. The smaller of the three, C or Proxima, is a diminutive red dwarf, which is not much bigger in size (although much heavier) than Jupiter, the largest planet in our solar system. Ten Proximas could fit across the face of the Sun. In its million-year orbit around AB, Proxima just happens to be on the sun-ward side right now, so has the (somewhat temporary) honor of the nearest star.

Recently, Proxima was reported to host an Earth-size exoplanet in the habitable zone, where liquid water could exist on a planetary surface, which is considered an important pre-condition for life. X-ray studies of Alpha Cen AB by the Chandra Observatory show that these sun-like stars have ups and downs in their high-energy coronal activity similar to the sun's 11-year sunspot cycle, and that the radiation environments (X-rays and UV) of both stars are not too different from that of the sun (which is not awful, else life would not have thrived on our Earth for eons).

Alpha Cen AB are not yet known to host exoplanets, but if such companions ultimately are found in the habitable zones of either star, there is no high-energy obstacle to the development of life. It's a different story for Proxima, however, which is categorized as an X-ray flare star, not unusual for these red dwarfs. The bursty, harsh radiation environment in Proxima's habitable zone, which is very close to the star because red dwarfs produce much less heat at a given planetary distance than the sun, is simply terrible: Potential life forms on Proxima's planet would be well-advised to grow thick lead shells or live entirely underground.

Curiously, the age of Alpha Centauri probably is about a billion years older than the sun, so it is possible that advanced civilizations might have sprung up there, and fallen, long before even dinosaurs made their appearance on our own planet. One thing is clear: Alpha Centauri will be the first stop by interstellar explorers from Earth, simply because it is so much closer than the next nearest candidates, there are three different stars to visit, and at least one (Proxima) has a potentially habitable planet (putting aside the horrible space weather forecast).

In recent years, I and an international team have carried out major programs with HST's STIS spectrograph to collect high-quality UV spectra of nearby, bright examples of both hot and cool stars (including Alpha Cen AB) to serve as fundamental references for future observational and theoretical research. This effort is called the Advanced Spectral Library (ASTRAL).

3. How has the study of stars changed over the years and how has this advanced yours and others' work?

Almost all areas of astronomy, especially in space, are driven by advancements in technology. These range from new camera designs to power more sensitive instruments to Moore's law that enables, for example, ever more sophisticated computer simulations of the growth of cosmic structure in the early universe.

The first orbiting UV observatories in the late 1970s were smaller than a ski condo refrigerator and could capture only the nearest and brightest stars, and then not particularly well. (But we astronomers were delighted to work with that data then because there was nothing like it before.)

Nowadays, we use state-of-the-art instruments (relatively) recently installed into school-bus-size Hubble. (Although 30 years old, the crucial main telescope mirror still is the best ever made.) With the Boulder-bred COS spectrometer on board, we can reach down to the faintest cataloged cool stars.

Technology has enormously expanded astronomical discovery space, and computing breakthroughs are allowing us to corral this big-data bonanza. Advanced numerical simulations are providing crucial insights into how stars change over time, from their birth in swirling clouds of dust and gas, to slow growth during the long period of internal hydrogen fusion "burning," to the rapid evolution at the terminal stages when the hydrogen fuel is exhausted. At this endpoint, a sun-like star bloats up into a red supergiant, extending out to the equivalent of Mars' orbit, then explosively sheds its outer layers, while the insides retreat into a super-condensed hot white dwarf star.

As in many areas of science, technology makes the future of astronomy bright.

4. You note a "fundamental disagreement between helioseismology and surface spectroscopic measurements" on your web page. What is the disagreement about and what side are you on?

There is a long-running controversy in the solar community involving how much oxygen is in the sun – the so-called solar oxygen abundance crisis. Oxygen is important because it is the third most common element in the sun (albeit only at 0.1 percent concentration), after hydrogen (90 percent) and helium (10 percent).

Two independent sides are involved in the debate. One group interprets spectroscopic measurements of the solar atmosphere using sophisticated numerical simulations, something like the National Center for Atmospheric Research's (NCAR) Global Circulation models applied to the Earth's weather and climate. The other group images subtle sound-wave patterns on the solar surface and analyzes them in terms of internal properties of the sun, using techniques analogous to those that geophysicists deploy to probe the inside of the Earth with seismic waves.

The spectroscopists directly observe atmospheric spectral signatures sensitive to elemental oxygen, whereas the helio-seismologists have a less-direct way to measure oxygen, but the nuts and bolts of their technique is much simpler. The disagreement is about a factor of 2, with the spectroscopists on the low side. Normally, a mere factor of 2 disagreement in astronomy, where conflicts involving factors of 10 are common, would be heralded as a great achievement. But this is the sun, and the chemical compositions of all the other stars are pegged relative to it. So, this was a key issue.

About 10 years ago, I performed an independent evaluation of the spectroscopic analysis, and, unexpectedly, came up with a result much higher than the spectroscopic oxygen abundance, closer to the seismic value. In the process, I identified several aspects of the spectroscopic approach that were subject to perhaps questionable, and difficult-to-quantify, assumptions. Even though I am a card-carrying spectroscopist by trade, my conclusion was that the atmospheric spectroscopy was inherently too messy to be blindly trusted, and that the more straightforward internal seismology likely was more reliable. Thus, I have defected to the high-O side ("O" for oxygen). I currently have a bet – a bottle of fine Scotch – with one of my low-O colleagues on the eventual outcome of the debate.

5. What is a favorite item you have in your office that holds special meaning for you?

Propped on a shelf in my Duane office is a trapezoidal bronze plaque that was a prototype for a 1987 project called the

Scale Model Solar System (SMSS) at CU. My grad student at the time, Jeff Bennett, and I had taken on the project to commemorate aerospace engineering alum Ellison Onizuka and the other astronauts who perished in the shuttle Challenger disaster the year before.

The SMSS was intended to depict the relative distances and sizes of the sun and the planets on the same scale, 1:10 billion. (For you math whizzes, that's 1 to 10 to the 10th power.) On this scale, the sun is the size of a grapefruit; Earth, the head of a ballpoint pen about 15 yards away; Jupiter, a marble about a football field away; Alpha Centauri A, another grapefruit all the way down in Panama.

The exhibit consists of an array of black granite pedestals, one for each planet (counting Pluto, which had not yet been demoted to dwarf planet stature at that time) on the path extending from Fiske Planetarium about a half-mile north to Colorado Avenue next to the Engineering Building.

Jeff and I were looking for ways to display information for each planet, and our first idea was to use bronze plaques, which have a lot of advantages for an outdoor display in Colorado's notoriously harsh weather. Jeff enlisted the aid of a graduate student in the Fine Arts Department to cast a test plate for the central pyramid of the display (topped by the model sun: a polished, yellow-anodized aluminum sphere, courtesy of LASP). We paid the student $4,000 for the summer, from a construction fund graciously provided by then-CU President Gordon Gee. The final test plaque, after three month's work, was artistically stunning, but difficult to read and the cost was too high. In other words, an unmitigated disaster.

Jeff and I turned to a different approach: fiberglass panels with text and pictures under three-quarter-inch thick glass plates, with the scale-model planets cut as tiny hemispheres into the underside of the plates. The result was visually beautiful and super-informative, but unfortunately, within a few months, became water-logged thanks to an unforeseen bad confluence of solar heating and Facilities Management lawn sprinklers.

A few years later, when Jeff had left Boulder for NASA Headquarters in Washington to oversee educational programs including a new SMSS project for the Washington Mall, I managed to secure a grant to replace the failed glass plates with bronze plaques, this time professionally casted. A talented undergraduate student, Jodi Schoemer, was responsible for most of the design work on the new plaques, which have graced the granite pedestals for the nearly three decades since. Jodi currently is director of Experiences and Partnerships at Denver's Museum of Nature and Science.

Meanwhile, Jeff Bennett has become a noted astronomy textbook and popular science writer; his undergraduate texts continue to be used in my department (APS). I still have the original flawed SMSS bronze plaque to remind me, as I'm sure Thomas Edison would agree: Experimentation does not always succeed and failures at times can be expensive, but if you keep at it, something eventually will work.

Incidentally, there is an effort afoot, led by current APS grad student Jimmy Negus, to replace the current SMSS with an updated, state-of-the-art display. This would be an awesome enhancement to the educational experience of CU undergrads and the many visitors to our campus as well.

CU Faculty Voices: Coming to terms with growth[4]
[5]

Editor's note: This is one in a series of commentaries[6] by CU faculty, presented by the Faculty Council Communications Committee and CU Connections. Learn more here[7] and submit your own column pitch.[8]

By George Cheney and Sally Planalp

We have all bumped up against taboo topics in everyday conversation, at work, in public discourse, and in popular culture. Death is one obvious example. It is difficult for death to get the attention it deserves as a fact of life, so we

create spaces like “Death Cafés” to talk about it.

Ironically, taboo topics may be exactly the ones most in need of discussion, as we have learned recently when racial oppression, economic inequality, sexual harassment and climate change have emerged from the shadows. Sometimes taboo topics are not “elephants in the room,” but taken-for-granted creatures in the room that remain unmentioned.

A persistent but troublesome taboo topic is growth. In U.S. politics, economics and across the major sectors (business, government and the nonprofit sector), growth is part of the ideological fabric of the modern world. To speak of something other than growth is usually heard as a downer. As Australian social commentator Clive Hamilton explained in Growth Fetish in 2003, the obsession with growth, largely in the senses of seemingly limitless market expansion and the accumulation of material goods, has led to environmental devastation; it has exacerbated social divides; and it has left many people alienated from each other, nature and meaning. In short, our accustomed notions of growth are plainly not sustainable. We may live in the digital age, but we are certainly not post-industrial.

Now is the time to launch a discussion of how we might grow as individual humans and as humankind in ways that are more sustainable and satisfying (what we might call “post-material growth”). The most obvious way is to move beyond addiction to material growth to other forms of growth, much as individual humans stop growing physically but continue to develop socially, ethically, intellectually, spiritually, emotionally, etc., as they move toward taking responsibility for their own lives and those of others.

Universities should lead this conversation because they have always fostered diverse forms of growth despite pressures to focus on material and economic growth alone. We remember our college days when we took courses that had enormous influence on our personal growth: art history, current social issues, death and dying, statistics (yes, really), creativity, utopian societies — to name a few. Being exposed to those ideas expanded our horizons and enriched our lives.

The University of Colorado plays an important role with its programs and initiatives on sustainability, including questioning some of the most familiar ways of growing. Our campus in Colorado Springs includes Sustainability Demonstration House, Farm, multidisciplinary undergraduate minor, and connections to health and wellness (https://www.uccs.edu/sustain/[9]). CU Boulder has many programs tied to a range of academic units, including an innovative “Masters of the Environment” graduate program, and a variety of green initiatives that extend into the wider community (https://www.colorado.edu/sustainability/programs[10]). CU Denver has a cross-disciplinary Sustainability program, including an undergraduate minor (https://clas.ucdenver.edu/sustainability/[11]). Both CU Denver and the CU Anschutz Medical Campus have implemented sustainable practices (such as LEED-certified building and greater efficiencies in energy and water use). And there are more programs than noted here; check them out.

Higher education should also play a major role in stimulating and guiding public discussions about the limits of material growth. In President Jimmy Carter’s somewhat delayed Independence Day speech of 1979, he called on the nation to reflect on its own values, to confront what was then called the energy crisis, to be less materialistic and consumer-oriented, and to ground a new kind of confidence in a sense of common purpose. Carter was questioning parts of our shared culture and habits of doing business, asking the country to consider alternatives. Interestingly, the speech was first received with approving reviews; however, very quickly media coverage and public opinion shifted. Carter was charged with condemning “the American way of life” because he raised the taboo topic of the nature of growth. The warning now seems prescient.

Today, the idea of endless growth, expansion and accumulation lives on, even against overwhelming evidence of the limits to our familiar, and sometimes mindless, ways of living on this planet. The climate and therefore our civilization are in crisis. The spectacular successes of industrialization, capitalism, bureaucratization, chemical agriculture and technological development all are haunted by downsides that are becoming increasingly and dramatically apparent. There is not the space here to examine or debate the complexities of how these and other societal forces interact, but established ideas of success — and especially measures of growth — need to be rethought and put in an entirely new frame for our time.

For 50 years, the Gross Domestic Product (GDP) has been recognized as a significantly flawed measure of overall economic and social well-being because it adds rather than subtracts the effects of problems, such as rising cancer

rates or oil spills due to their economic generative capacity. At the same time, the GDP does not take into account measures of individual or group satisfaction (subjective wellbeing); nor does it account for widening gaps in income and wealth, differential access to healthy food, rates of depression, or the strength of social capital.

There are viable and tested alternatives to the GDP (collectively called Genuine Progress Indicators) that broaden notions of progress to include a wide range of meanings of well-being — for households, neighborhoods, communities and societies. Although such indicators also merit scrutiny for what they measure and leave out, they do help to direct our attention to more holistic assessments of economy and society. Some of these indicators focus quite directly on happiness, which is today a serious subject of research in fields ranging from philosophy and psychology to political science and economics. Studying happiness is no longer a laughing matter – unlike 50 years ago.

For organizations, industries and professions, traditional measures of success — most of which lean on familiar notions of growth – beg reexamination today. Success should be measured in terms of progress toward longer-term goals, and this requires that we stretch time horizons typically used in indicators and assessments.

We must ask: What truly is sustainable, in the production and consumption of goods and with respect to planned obsolescence, waste and pollution? For all sectors, it is time to take more seriously alternative organizational forms that can at once be agile while maintaining a focus on social and environmental aims. For educational institutions, then, what are the impacts on lives and communities, the nation and the world, 10, 20 and more years down the road? For our students in many disciplines, considering what is truly “sustainable” can invite penetrating conversations about domains ranging from the physical environment to consumption to pace of life.

The rubric of sustainability, now established in our university system as in many others, is a key but not the only place to have such conversations. The ideas of transforming energy, transportation and connections to the land and water require complex and deep forms of collaboration, from the group decision-making level to imaginative cross-sector initiatives. Other related terms such as resilience, which now has traction in a number of disciplines, can help to shift attention toward what makes humans and eco-systems survive and even thrive. Resilience, restoration and regeneration can also help people in both rural and urban settings move toward a realistic understanding of their role in and dependence upon nature, as opposed to a worldview that places us outside and above it.

If ever there were a time for revisiting our society’s goals and familiar practices, it is now. And that brings us back to what is not only acceptable but essential to talk about. It is often said that proposals to transform our society and economy into more sustainable institutions are unrealistic. But is it realistic to pursue business as usual, knowing that untold suffering and unparalleled disaster are just beyond the reach of our headlights? A strong embrace of sustainability and non-material growth might not save us — our civilization – but it can give us a fighting chance and help us lead richer lives in the process.

George Cheney (Ph.D., Purdue University) is a professor in the Department of Communication at UCCS. Previously, he held regular faculty positions at a number of other institutions. Cheney’s teaching and research interests include organizational identity, employee participation, cooperative work structures, dialogue, and environmental sustainability. He has authored or co-authored 11 books and over 100 articles and chapters. Cheney is a practitioner of service learning and engaged scholarship. He has consulted with organizations in all three major sectors. He regularly contributes op-eds to newspapers in the Four Corners region. He was the recipient of the 2019 Sustainability Award at UCCS, for work in collaboration with a variety of colleagues on campus and in the larger community.

Sally Planalp (Ph.D., University of Wisconsin-Madison) is a professor in the Department of Communication at UCCS, a former faculty member at CU Boulder, a master’s alumna of CU Denver and an employee long ago at what is now the CU Anschutz Medical Campus. She has done research in the areas of interpersonal communication, communication in close relationships, communication and emotion, and health communication. At UCCS she teaches classes on interpersonal perspectives on health communication and on personal and professional relationships.

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Faculty Council Committee Corner: Communications[13]

Editor's note: This is part of an ongoing CU Connections series in which the Faculty Council[14] highlights each of its committees and their efforts. See past installments here.[15]
[16]

The Faculty Council Communications Committee has been charged with enhancing the communication of information within the university, and to the broader communities impacted by the university, in several ways: advising systemwide communication media to assure inclusion of relevant content, identifying appropriate technology used to communicate information, and coordinating the flow of information among campuses and with systemwide university communications, among others[17].

During the 2019-2020 academic year, much of the committee's focus to date has been on advancing efforts that were initiated in the last year or two.

First, the communications committee is making progress on the systemwide faculty guide, which will be finalized by the end of the spring semester. The faculty guide will be housed on the CU Faculty Council website, and will serve as a comprehensive repository of resources and information for new and existing faculty members from all four campuses.

Second, the committee has continued to solicit submissions to the recently launched opinion article series in CU Connections, Faculty Voices[6] As part of this series, we welcome pieces that explore timely and intriguing topics via a combination of personal opinion, experience and/or research.

We are pleased to announce the publication of four articles during the spring semester, starting with Coming to terms with growth[4] by George Cheney and Sally Planalp (UCCS). Other upcoming articles include explorations of technology in the classroom (Kathia Ibacache, Boulder), diversity and inclusion (Christopher Bell, UCCS), and the benefits nurses bring to health care (Judith Scott, UCCS)

The committee this year also has begun exploring ways in which it can support the work and communication needs of the Faculty Council and its committees. As part of this effort, the Communications committee will meet with other Faculty Council committees to hear about their needs. It also will examine the communication channels currently employed by the Faculty Council, and make recommendations based on the findings.

The committee is currently recruiting representatives from CU Denver, CU Boulder and CU Anschutz. Feel free to contact any of our members with questions or comments:
Carmen Stavrositu, Chair | UCCS, Communication Carrie Makarewicz, Vice Chair | CU Denver, Architecture and Planning Kathia Ibacache | CU Boulder, University Libraries Judy Scott | UCCS, Nursing and Health Science Katie Sullivan | UCCS, Communication Ken McConnellogue | CU system, Vice President, University Communication* Cathy Beuten | CU system, University Relations* Jay Dedrick | CU system, University Relations*

* Non-voting members

Office of the President helps launch 2020 Sustainability Challenges[18]

[19]

The Office of the President has provided funding to encourage the development of sustainability innovations by CU students for their campuses and communities in spring 2020.

Two competition series will reward students for their sustainability innovations: the Sustainable Solutions Challenge, and the addition of a sustainability special prize to CU Boulder's New Venture Challenge entrepreneurial accelerator.

"CU is a leader in sustainability, so it's natural to have our best and brightest students compete with their great ideas," said CU President Mark Kennedy. "I'm confident we're going to see some impressive and innovative suggestions."

The President's Sustainable Solutions Challenge (PSSC) will be a two-part event culminating in the President's Sustainable Solution grand prize of $2,000, awarded at the celebration of the 50th Anniversary of Earth Day, April 22. The PSSC will award a prize of $1,000 to one team from each campus as the first round of the challenge. The top two teams from each campus will advance to compete for the grand prize.

For the competition, students (as individuals or teams) are invited to develop multidisciplinary approaches that result in short-pitch presentations that describe proposed sustainability initiatives to address environmental quality, natural resource use, and social justice with economic longevity on a CU campus or through the CU system.

Qualifying teams will present their ideas to a panel of judges in both rounds and will be evaluated on anticipated impact, innovation in addressing a sustainability issue and the feasibility of the idea. Prize funding will be directed toward the individual or teams and not to project implementation. All proposals will be shared with appropriate campus units for consideration for potential implementation.

Students may register anytime between Jan. 29 and March 9. Each campus will host an information session in February and a proposal workshop in March. Proposal submissions are due in early April and the top 20 proposals will advance to the campus-level first stage pitch competitions.

For information on the President's Sustainable Solutions Challenge, visit www.cu.edu/pssc[20]

The Office of the President also will fund the first special prize for sustainability in CU Boulder's New Venture Challenge. This series is focused on promoting innovation for sustainability outside of campus through the creation of a new business or social enterprise. The $1,500 NVC Sustainability Special Prize will be awarded in March. All NVC participants are developing entrepreneurial ideas and competing for a $100,000 grand prize in April. More info: https://www.colorado.edu/nvc/[21]

Chief Diversity Officer search on track for February announcement[22]

The search for a chief diversity officer for the CU system is advancing on schedule, the Faculty Council was told during its Jan. 23 meeting at 1800 Grant St., Denver.

Felicity O'Herron, chief human resources officer for the system, said the search committee's work is on track to allow for a late February announcement of President Mark Kennedy's choice for the role.

Some 31 candidates' resumes were reviewed by the search committee, which expects to conduct interviews with a pool of six or seven.

O'Herron said the person in the new role will report to President Kennedy and will collaborate with chief diversity officers at the campus level. While the system officer will have some oversight over the work being done at the campuses, campus officers will not report to the system CDO.

O'Herron said a faculty pay equity analysis previously suggested by Faculty Council remains under consideration. Possible changes to state law regarding the matter have slowed progress, but leadership plans to hire a consultant "to help us work through some questions," she said.

Also at last week's Faculty Council meeting:
The strategic planning process continues along its timeline, with working groups delivering recommended metrics to leadership last week. Todd Saliman – system vice president for finance and chief financial officer, and co-chair of the strategic planning committee – said summaries of the metrics should be posted to the strategic planning website[23] around Feb. 8. Action steps from working groups are due to leadership on March 13.

The council heard an update from representatives of EY-Parthenon[24], which was awarded a contract[25] to provide advice and guidance to the university in its efforts to advance online education across the CU system. The consulting work so far has included interviews of 70 faculty members. Early findings in market research show that Colorado residents have a strong willingness to consider choosing online programs from CU campuses, while consideration is lower in surrounding states and beyond. Details will be posted soon on a website, with CU town halls and focus groups expected later.

Callie Rennison,[26] candidate for the Board of Regents in the 2nd District, attended the meeting for a Q&A session. A Democrat and resident of Superior, she's running for the seat held by Linda Shoemaker, D-Boulder, who is not seeking reelection. Rennison, a professor in the School of Public Affairs at CU Denver, has received endorsements from Shoemaker and Regents Irene Griego, D-Jefferson County, and Lesley Smith, D-Boulder. Faculty Council Chair Joanne Addison said the council aims to invite all candidates for regent to appear at a council meeting. The council does not endorse candidates for regent.

Staff Council announces plans for Excellence Awards[27]

Susan Heinzeroth, director of SageRiver Consulting and a faculty member in the management division of CU Denver's Business School, will be the keynote speaker at the Staff Council's Staff Excellence Awards and Professional Development Day, scheduled for April 17 at the Hilton Denver Inverness.

Chair Ryan Untisz said Heinzeroth will discuss the skills needed to foster connection, partnership and positive change, even if you don't have a formal title.

"This pertains to what we do as council members," he said. "We all are peer leaders and must influence and work with many different types of people without having the authority to direct people and that requires a unique set of skills."

The event honors staff who have made significant contributions to the university and also serves as a professional development day for council members of all campuses. The learning portion of the event will be focused on the interconnectedness of communication skills, emotional intelligence, navigation and trust perceptiveness, said Tara Dressler, council vice chair.

In other business:
Untisz said discussions on revising the tuition benefit are continuing. He has met with several administration officials to inform them about concerns of staff members and to exchange ideas. He said President Mark Kennedy is interested in resolving some of the issues with the benefit. Currently, campuses administer the tuition benefit differently because of

costs, class sizes and the number of people who use the benefit. Untisz said any changes to the benefit likely will be implemented incrementally. A committee is updating the council's bylaws. Revisions will be voted on by the council when potential amendments are completed. Council appointed Missy Sernatinger to the position of secretary.

Employees soon will receive tax forms W-2, 1095-C and 1042-S[28]

All 2019 W-2s will be mailed by Jan. 31, and 2019 1095-Cs will be mailed by March 2 to mailing addresses employees have on file in their employee portals. Both forms will be available in the portal shortly after release.

All 1042-S forms will be mailed no later than March 15.

Form W-2

The W-2 reports employees' wage and salary information as well as the amount of federal, state and other taxes withheld from their paychecks.

Forms will be available in ESS on Jan. 31. Access Form W-2 in the portal:
Log into the employee portal[29]. Select the **CU Resources tab**. (CU System employees can skip this step.) Open the **CU Resources Home** dropdown menu at the top of the page and select **My Info and Pay**. Choose the **W-2** tile. You will be prompted to verify your identity[30] before you can access this information.
Note for employees who access their W-2 through the ADP portal: You must enter the ZIP code you lived in as of Jan. 6.
What if employees see two different W-2s in their portals?
If employees see two W-2s (CU and CUR), it is recommended that they submit the ADP W-2 with their tax filing. This W-2 is a combination of CU and CUR wage and tax information. Submitting multiple W-2s from the same company or with the same EIN may cause confusion with the IRS and states, which may cause a delay in processing their tax return.
What if employees did not receive their W-2 in the mail?
Employees who do not receive their W-2 in the mail should reference the Employee Services website [31]for next steps.

Form 1042-S

Nonresident and resident alien taxpayers whose wages are eligible for a tax treaty exemption, and nonresidents who received taxable or tax treaty exempt non-qualified scholarship payments, will be issued Form 1042-S[32].

Individuals with tax treaty exempt income or a taxable scholarship should wait to receive the 1042-S before filing personal income tax returns. In some cases, nonresident employees may also receive Form W-2 if receiving taxable wages.

While the deadline for issuing Form 1042-S is March 15, Employee Services expects to mail the forms by mid-February to allow taxpayers more time to file.

Form 1095-C

Form 1095-C is sent annually, providing employees with information regarding employer-provided health insurance coverage. It specifies the months of health care coverage for the employee and their eligible dependents. When completing their federal tax return, employees must indicate whether they had qualifying health coverage for all of 2019 or whether they qualified for a health coverage exemption.

Per the IRS, employees are not required to submit this form with their 2019 tax filing. However, they should keep this form with tax records. If questions arise, employees should consult a qualified tax adviser.

Access Form 1095-C in the portal:
Log into the employee portal[29]. Open the **CU Resources Home** dropdown menu at the top of the page. Click the **Benefits and Wellness** tile. Choose the **Benefits Tools** tile and click the **View Form 1095-C** tile.
You'll be prompted to verify your identity[30] before you can access your forms. Once authorized, click on the tax form you'd like to view and download your form. If a form has not been issued to you, a message will populate stating that no form is available.

Helpful resources
W-2 resources

General information about Form W-2 can be found here[31].

For additional assistance, please contact an Employee Services payroll professional at 303-860-4200, option 2.
1095-C resources

For questions about Form 1095-C, a qualified tax adviser should be consulted. For general information, call a Benefits Professional at 303-860-4200, option 3, or email benefits@cu.edu[33].
1042-S resources
General information about Form 1042-S can be found here[32].

For additional assistance, please email IntlTax@cu.edu[34].

CU Boulder announces expanded benefits and some fee adjustments for graduate students [35]

Colorado wins second straight Pac-12 Zero Waste Challenge [36]

UCCS hosts first El Paso County Suicide Prevention Conference [37]

Reddy provides update on Chancellor Search Committee [38]

Grant to help CU Anschutz researcher learn why therapeutic horseback riding benefits autistic children[39]

Kapteyn, Murnane win prestigious physics award [40]

George named to College Football Playoff Selection Committee[41]

Pomper retires after 31 years of assisting students[42]

Links
[1] https://connections.cu.edu/spotlights/five-questions-thomas-ayres[2] https://connections.cu.edu/sites/default/files/ayres_top_0.jpg[3] https://connections.cu.edu/sites/default/files/ayres_solar-system-map.jpg[4] https://connections.cu.edu/stories/cu-faculty-voices-coming-terms-growth[5] https://connections.cu.edu/sites/default/files/cufv_logo_hdr_0.jpg[6] https://connections.cu.edu/tag/cu-faculty-voices[7] https://connections.cu.edu/stories/faculty-invited-contribute-new-cu-connections-commentaries[8] https://connections.cu.edu/cu-faculty-voices[9] https://www.uccs.edu/sustain/[10] https://www.colorado.edu/sustainability/programs[11] https://clas.ucdenver.edu/sustainability/[12] https://doi.org/10.1016/j.ecolecon.2019.106441[13] https://connections.cu.edu/stories/faculty-council-committee-corner-communications-2[14] https://www.cu.edu/faculty-council[15] https://connections.cu.edu/tag/faculty-council-committee-corner[16] https://connections.cu.edu/sites/default/files/fac_comm-cmte_top.jpg[17] https://www.cu.edu/faculty-council/committees/faculty-council-communications-committee[18] https://connections.cu.edu/stories/office-president-helps-launch-2020-sustainability-challenges[19] https://www.cu.edu/pssc[20] http://www.cu.edu/pssc[21] https://www.colorado.edu/nvc/[22] https://connections.cu.edu/stories/chief-diversity-officer-search-track-february-announcement[23] https://www.cu.edu/strategic-planning/[24] https://www.ey.com/po/en/expertise/higher-education-and-workforce-development[25] https://connections.cu.edu/stories/rfps-conclude-future-technology-and-online-education-cu-begins-take-shape[26] https://callie4cu.com/[27] https://connections.cu.edu/stories/staff-council-announces-plans-excellence-awards[28] https://connections.cu.edu/stories/employees-soon-will-receive-tax-forms-w-2-1095-c-and-1042-s[29] https://my.cu.edu/[30] https://www.cu.edu/employee-services/it-takes-two-portal-security-strengthened-new-tool[31] https://www.cu.edu/employee-services/payroll/self-service/w-2[32] https://www.cu.edu/employee-services/international-employees/1042-s-form[33] mailto:benefits@cu.edu[34] mailto:IntlTax@cu.edu[35] https://connections.cu.edu/stories/cu-boulder-announces-expanded-benefits-and-some-fee-adjustments-graduate-students[36] https://connections.cu.edu/stories/colorado-wins-second-straight-pac-12-zero-waste-challenge[37] https://connections.cu.edu/stories/uccs-hosts-first-el-paso-county-suicide-prevention-conference[38] https://connections.cu.edu/stories/reddy-provides-update-chancellor-search-committee[39] https://connections.cu.edu/stories/grant-help-cu-anschutz-researcher-learn-why-therapeutic-horseback-riding-benefits-autistic[40] https://connections.cu.edu/people/kapteyn-murnane-win-prestigious-physics-award[41] https://connections.cu.edu/people/george-named-college-football-playoff-selection-committee[42] https://connections.cu.edu/people/pomper-retires-after-31-years-assisting-students