



## **Ideas to Impact White Papers**

**Submitted to the Review Committee**

**April 2023**

## Table of Contents

Bridging the Gap: DU Mental Health and Wellness Collaborative	1
Center for a Regenerative Future	10
Center for Pathways to Access and Equity in Education	28
Climate and Society	38
Grand Challenges in Health Equity	46
The Institute for Housing Affordability and Strong Communities	54
Interdisciplinary Institute for Democracy	68
Quantum at DU	78

## **Bridging the Gap: DU Mental Health and Wellness Collaborative Clinic**

### **Why this topic?**

The DU Mental Health and Wellness Collaborative (“the Collaborative”) is driven by compelling mental health needs of communities. The public good is central to DU’s mission; and the urgency for high quality, accessible mental health care cannot be overstated. Prior to the COVID pandemic, mental illness affected 18.5% of Americans (43.8 million people). After the pandemic, the prevalence of mental illness rose to 20.78% (50 million Americans) ([Mental Health America, 2023](#)). Further, a recent Centers for Disease Control and Prevention (CDC) study that found that 44% of American teens report that they feel “persistently sad or hopeless” and one in five had contemplated suicide. Even more alarming is the ongoing lack of access to care due in part to a national mental health workforce shortage ([Mental Health America, 2023](#)). Over half (54.7%) of adults and youth (59.8%) with a mental illness received no mental health treatment. The [Senate Committee on Finance Mental Health Care in the United States Report](#) that oversees Medicaid, Medicare, and CHIP programs stated, “The house is on fire, and the nation is short on firefighters equipped to put out the blaze. This crisis has been made even worse by the disruption, isolation, and loss experienced in the COVID-19 pandemic”. Unmet mental health needs contribute to many other social problems including homelessness, poverty, substance abuse, and interpersonal violence.

In May 2021, Colorado declared a Youth Mental Health State of Emergency due to increasing levels of mental health crises including suicide attempts by children ([Children's Hospital, 2022](#)); and Colorado ranks near the bottom nationally in meeting mental health needs. Denver residents experience many barriers to receiving needed behavioral health services such as cost, inadequate insurance, and long wait-times for appointments. ([DDPHE, 2023, p. 7-8](#)). The metropolitan area is described as a “mental health desert”. Denver also has documented differences in behavioral health conditions and access to services by race, ethnicity, age, income, and insurance status. Marginalized individuals (including those who are ethnically, racially, and/or linguistically diverse; unhoused, elderly, disabled, and LGBTQ+ persons; and those with limited access to resources) face additional barriers and even lower rates of service engagement.

The Collaborative has completed the initial steps of a long range vision to improve mental health services, innovate through research on prevention, and strengthen interprofessional workforce development. Our approach is inclusive of diverse perspectives, including underrepresented racial, ethnic, linguistic, socioeconomic, nativity, gender, sexuality, and ability groups and across the lifespan. The Collaborative is positioned to tackle unmet mental health needs of Coloradans, provide a cutting-edge training opportunities for DU students, and lead nationally in interprofessional mental health workforce development.

### **Why now?**

The Collaborative is uniquely positioned at DU to act swiftly and effectively building on impactful work together since 2016. Some of our key accomplishments to date (*DU Health and Wellness Collaborative Annual Report available upon request*) include:

- Involved more than 100 faculty, 40+ community partners, and 40+ graduate students, many of whom committed to continuing to shape our future directions.

- Partnered with CiBiC at Daniels Business College for the development of a business plan (*available upon request*).
- Developed a [website](#) designed to improve accessibility of DU-based mental health services.
- Engaged with Deans, the SVP for Graduate Education and Research, and Special Counsel to the Chancellor for Academic Innovations.
- Co-taught an interprofessional course, wrote a scholarly publication, submitted a graduate training grant (HRSA), and formed an interprofessional faculty search committee.
- Completed an initial vetting of over 20 physical locations for Collaborative centers across Denver.
- Conducted [Community Partner Mapping](#) of mental health needs with 600+ other agencies through data visualization.
- Initiated a Community, Student, and Faculty Fellows program with a cohort currently engaged in promoting mental health efforts for underserved families.
- Mentored students across units in an interprofessional environment to assist with the Collaborative's efforts.
- Secured initial seed funding and secondary funding from DU's Knowledge Bridges.

These efforts have led to the following lessons learned through community engagement:

- We must center community voices, needs, and priorities as we move forward with planning, including the development of areas of focus and coordination of site and project selection.
- Community partners enjoy the role they play in training, including supervising our students; they also value the work done at DU, yet would like to see DU take a more active role in supporting mental healthcare in Colorado.
- DU must prioritize providing clinical services in locations where community need presently exists is needed, rather than limiting our services to our campus.
- DU could play an important role in addressing stigma of mental illness in the community and increasing efficiency of technology use in treatment.
- DU students and faculty are desperately needed to partner with agencies on research and evaluation.
- Our role in training and workforce development could be both pre-service training on student-identified needs (systemic interventions, suicide risk assessment and prevention, addictions, and LGBTQ+ populations) and professional development.

The stakeholder-driven, innovative, and silo-busting nature of the Collaborative's vision resonated with our faculty and clinic director stakeholders, as well. Lessons drawn from their engagement include:

- Faculty support the Collaborative and its potential for harnessing the collective voice and expertise of our faculty clinical services, training, and research.
- Faculty endorse community-led targeting of community needs and addressing challenging barriers such as access to clinical services and lack of evidence-based programming.

- Faculty and DU Clinic Directors expressed concerns about institutional barriers, such as funding challenges and workloads that might prevent full engagement.
- Concerns were overshadowed by the enthusiasm for the many expected benefits of interprofessional clinical training, supervision, service delivery, and research, particularly the potential for interprofessional collaborations for research and within complementary areas of expertise.

Similarly, students are excited about interprofessional opportunities:

- Students express a hunger for more interprofessional supervision and collaboration.
- Students describe practical and bureaucratic barriers that keep their learning opportunities within separate silos. They want increased institutional-level support for research and collaboration across departments and with community partners.
- Students note that holistic services to address community needs, particularly in “gap” areas of unmet need, were crucial, and that low-cost, culturally-responsive training is imperative.

This work positions the Collaborative to hit the ground running. We seek to build on prior work and partnerships to address pressing mental health needs and positioning DU as the preeminent training site for interprofessional mental health care and research.

### **What will be the outcomes and impacts of this initiative on society when funded?**

Connecting our expertise and capacity to the need for mental health services presents an unparalleled opportunity to forge lasting change in our communities, drive learning and innovation, and create knowledge bridges across departments and communities. We can break down structural and administrative barriers to interprofessional education, training, and collaborative practice, and serve as a national model for collaborative practice in the community to address unmet need.

The vision for the Collaborative over the next 5 years is to build and bring into full operation a multi-tiered mental health center that is embedded in the community and led by directors of clinical service, research, and interprofessional training. We anticipate the need for students, faculty, and staff, plus technical and physical infrastructure, to support the center. This comprehensive approach must be informed by the needs and strengths of our community partners, while maximizing the collective expertise of the DU faculty. **Ultimately, our goal is to be the ‘go-to’ trusted source for mental health services, research, and training in Colorado and beyond.** This aligns with DU’s public good mission by fueling exemplary, innovative training for DU students. With the support of donors, grants, contracts, and fees from services, we could scale our operation up to treating thousands of clients and educating hundreds of students each year.

### **We have identified 3 phases of our vision with impact anticipated during and after each phase:**

*Phase 1: Finding our community and partners.* Although we held an initial community partner event to identify local mental health priorities and needs, that work occurred before the pandemic. The world has dramatically changed since that time. We will conduct a new

community assessment using innovative modeling (e.g., GIS) and a series of community partner meetings. We will work with community partners to articulate the most pressing mental health needs of their community, and identify the faculty, staff, and students at DU that have relevant expertise to meet those needs. This will remedy a historic pattern of our university's top-down community engagement. At the end of Phase 1, we will have identified a community location and partnerships through which we will collaboratively build a mental health center to address community-identified needs through research, clinical services, and workforce training. The success of Phase 1 is dependent on adequate resourcing for staffing and faculty leadership (*Sample Budget for Phase 1 available upon request*).

*Phase 2: Physical structure & Interprofessional Structure.* In this phase, we will work with our community partners to identify a new or existing space that meets community mental health needs. We will consult with colleagues from other mental health centers to understand how to best staff our center for maximum effectiveness in services, outcomes, research, and interprofessional training. This space will serve DU's vision of providing clinical services to the community by faculty, staff, and students while generating opportunities for research and training, and it will incorporate spaces that are flexible and responsive to community needs identified in Phase 1 (e.g. meeting rooms open to the community, gathering/play space for youth while parents utilize services). Our community-based Interprofessional Education (IPE) structure will offer stellar training opportunities for DU students to be uniquely trained in community-based and IPE services, on-site research-capacity for high quality clinical trials to develop, and test evidence-supported interventions. Developing interventions in the community, and in partnership with the community, will produce mental health practices that are more responsive to the needs of the community and begin to bridge the gap between surviving and thriving especially in underserved and vulnerable groups.

*Phase 3: Opening the center's doors and operating the center for years to come.* As noted in our original submission and restated in this paper, **our goal is to be the "go-to" trusted source for mental health services, research, and training in Colorado and beyond.** The cost and outcomes of Phases 2 and 3 depend on Phase 1. On guidance from Advancement, we have explored budget models for all phases of our mental health center, but it feels premature at this time to commit to a financial model before we have a community partner(s). As we move forward to Phase 1 implementation, we can better articulate our needs for each phase. Details and specifics forthcoming.

### **Why DU? What are DU's current strengths around area of focus?**

DU has extensive existing infrastructure that can support expansion of educational and community services. On campus, we have world class scientists (researchers and clinicians) in wellness and behavioral health including from GSPP (Graduate School of Professional Psychology), CAHSS (College of Arts, Humanities & Social Sciences) Dept of Psychology, MCE (Morgridge College of Education), and GSSW (Graduate School of Social Work). Faculty serving on the Collaborative are positioned perfectly to conduct interdisciplinary work and to mentor, teach, and supervise students in the delivery of those services.

We have nearly 1,000 undergraduates and over 2,100 graduate students studying mental health related topics at DU, and many of our mental health and wellness-relevant programs are top-rated by national indices. We are already regarded for providing exceptional training to the next generation of professionals, and developing a center like the one we are proposing would allow us to recruit and fund some of our best trainees.

Many faculty have established community partnerships and various groups on campus are already providing incredible services to the community through their DU-based clinics and labs. Services include group, couples, family, and individual therapy; play therapy, infant and early childhood mental health support, cognitive/neuropsychological evaluations; assessments required for professional and educational purposes; programming for substance abuse intervention; domestic violence prevention; the evaluation and treatment of intergenerational and historical trauma and of trauma sustained by populations of migrant and displaced persons.

We can use our existing expertise and partnerships and expand on them by moving to a community-located service delivery model. We envision extending our reach by using existing telehealth service delivery systems, increasing the number of service providers currently embedded in schools and other community locations, and increasing the capacity of front-line providers and paraprofessionals through continuing education and professional development.

Specific examples of the university's strengths in the mental health arena include but are not limited to:

*Student & Community Provider Enhanced Training & Education:* The Collaborative will enhance successful graduate and doctoral training programs at DU by providing student and community-centered integrated interprofessional educational experiences. The proposed collaboration simulates the interprofessional collaboration that occurs in many health facilities, but rarely in academic settings. The diversity of expertise is beneficial for students and drives positive outcomes for clients. We will provide more coordinated professional development opportunities for community partners. These offerings can be coordinated with outreach to specific groups/organizations who express interest in developing their workforce through continuing education and micro credentials. The Collaborative has already partnered with CCESL (Center for Community Engagement to advance Scholarship and Learning) to provide workshops on interprofessional education (IPE) for their Community-Engaged Fellows Program and provided workshops and training on IPE for the Denver Public Schools Curiosity Series, GSPP COST and GSSW CLIMB programs (two HRSA-funded graduate training programs).

*Applied Mental Health Research and Training:* Mental and behavioral health needs are complex and effective prevention and treatment approaches require creative and innovative solutions. Our internationally recognized faculty are at the forefront of mental health research efforts. We have cross-unit expertise in research on adversity and trauma and in reaching marginalized populations including persons facing homelessness, discrimination, and poverty. For example, the ongoing Collaborative Fellows Program is comprised of faculty as well as student and postdoctoral trainees who were selected through a competitive application process. The Collaborative Fellows are partnering with [Thriving Families](#) to provide support to women,

babies, and families during the transition to parenthood. Fellows are implementing action steps including developing peer-to-peer supports across the Motherwise program and a partner agency (Alma Project) to better serve Spanish speaking clients, reviewing existing research, exploring possible research projects, and working with the 211 service referral resource (<https://www.211colorado.org/>).

*Artificial Intelligence Technologies to Advance Clinical Services & Research:* To date, researchers and supervisors have been limited in their ability to evaluate the quality of therapeutic services. We plan on utilizing an innovative artificial intelligence (AI) approach (i.e. the Lyssn System) that can capture, record, and code therapy sessions. This system can also provide ongoing feedback to therapists via session reports, daily reports, and weekly reports. These reports include aspects of the therapeutic interaction, such as empathy ratings, types of therapist statements, emotional content, and fully transcribed sessions. This will enhance training and research opportunities, and DU will be one of only a few universities using this innovative approach to studying clinical interactions and providing real-time feedback to developing clinicians.

**What makes our proposal so unique and innovative? How is DU uniquely positioned to execute this unique plan?**

The Collaborative has an existing team and model demonstrating an effective interdisciplinary approach. We have successfully engaged community partners, students, and faculty across units to identify and address pressing mental health problems and we are well positioned to expand this model if funded.

Researchers in each of the units represented by our team are developing new evidence-informed approaches to serving clients. These include Johnny Kim in GSSW's Solution-Focused Brief Therapy for families involved in child welfare system; Michelle Rozenman in CAHSS Dept of Psychology's Brief Behavior Therapy for youth with internalizing disorders; Jesse Owen in MCE's work on national practice-research mental health networks; Kim Gorgens, Jen McMahon and other GSPP partners' recent funding to expand the Denver Forensic Institute for Research, Service, and Training (Denver FIRST)'s competency-related programming and pilot an innovative, first-of-its-kind Brain Injuries Screening (BIS) Program serving populations with suspected brain injuries in the Colorado competency system.

Our world class scientists have experience disseminating clinically-relevant research so that people well beyond DU's campus can apply it (e.g., Anne DePrince's community-engaged, feminist, anti-racist research team conducts intersectional research that disrupts gender-based violence and other forms of oppression; she has written numerous op-eds on the topic, conducted trainings with law enforcement agencies, and spoken all over the country; Jesse Owen is the Editor of a top-tier APA journal entitled *Psychotherapy*; Jenn Bellamy is a nationally recognized expert in implementation of evidence-based practice as an author of multiple textbooks, peer reviewed publications, and training experience across allied mental health professions).

We have demonstrated success in reaching underserved populations (e.g., GSSW's Dr. Daniel Brisson is working with individuals experiencing homelessness, and Dr. Ramona Beltran work



addresses historical trauma among native communities; Dept. of Psychology's Galena Rhoades established Motherwise to serve high-risk individuals during the transition to parenthood; and GSPP and MCE's partnership with Denver-area criminal justice centers). In addition to these community-embedded clinical research projects, we have hundreds of undergraduate and graduate students receiving clinical training and providing clinical services to underserved populations in a variety of internships (e.g., at Denver Health, Servicios de la Raza; Second Chance Center; African Community Center, etc.) as well as internship sites across the country through our online programs.

Many of our units already have Continuing Education and certificate programs that are in high demand – we can build from what is in place already to further expand access to professionals who want to obtain interprofessional training related to mental health.

### **How does DU compare/compete locally and nationally on this subject matter domain?**

We would create a community-centered, innovative, state-of-the-art mental health center that is embedded in a mental health desert. There are no other mental health centers in the Denver metro area that prioritize evidence-based practice, interprofessional training, and clinical research generation.

We already partner with several of the area mental health service providers. These include hospitals (Denver Health and CU Anschutz) and community mental health groups such as Wellpower (formerly MHCD), Aurora Mental Health, and Kaiser Permanente. These groups, however, rarely conduct research, infrequently provide evidence-based mental health care, and do most of their training through supervision of graduate students (versus true interprofessional training).

Nationally, there are several models like the Collaborative (e.g., University of Nebraska, UCLA, Northwestern, Boston University, University of Louisville, Harvard/McLean Hospital). We have consulted with colleagues from some of these universities to gain more insights. They found that having a centralized multi-dimensional clinic can increase visibility and credibility with the community and funders. However, our model is distinct in that true interprofessional training is not integrated into the curricula of these models. Moreover most of these programs utilize a traditional model of IPE anchored in a medical profession (e.g., nursing, physical therapy; <https://nexusipe.org/connecting/ipe-centers>) and infused with mental health, where as we are truly centered in mental health professions.

### **Regarding DEI values and principles, how will this project, if funded, increase compositional diversity at DU and inclusiveness and justice at DU? How does it contribute to student interest and enrollments?**

As noted, well-documented disparities in access to and utilization of mental health services cut across virtually every minoritized community in the United States; in Colorado, all 64 counties have been designated Health Professional Shortage Areas in Mental Health ([HRSA Rural Health Information Hub](#)). Current and prospective DU students, faculty, and staff are eager to be part of the solution, and funding this project represents an innovative pathway to realizing the University's commitment to diversity, equity and inclusion.

The project is community-centered and driven by community partners and those they serve, leveraging DU's collective strengths to center these voices in effecting concrete, measurable change. Every aspect of the project—from its IPE framework and applied research model to the evidence-based, culturally-informed services offered—has been thoughtfully designed to provide opportunities for the kind of meaningful, “real world, real time” engagement demanded by the learners and scholars of today and tomorrow (e.g., [Mintz, 2022](#)).

This project offers appealing opportunities for service learning, paid practicum, didactic instruction, mentorship, and the development of marketable skills and community connections, inviting students and faculty from minoritized and under-resourced backgrounds to thrive while doing the work that likely drew them to their respective fields in the first place. DU can enhance its regional, national, and global reputation as not just a *thought* leader in this arena, but as an *action* leader in addressing the mental health crisis in this country. By defining the leading edge of inclusive, transformative, and next-generation training, service, and research, DU will attract a diverse array of students and professionals excited by the prospect of being part of a vibrant academic community with the reach and resources of an R-1 institution—and the heart of a “private university dedicated to the public good.”

### **How does this topic further DU's commitment to the public good?**

The Collaborative was conceptualized from the ground up as community-centered, driven by the needs and vision of community partners and those they serve with an emphasis on supports for vulnerable and underserved populations. This is leveraging the power of a “private university dedicated to the public good” in its purest form. The work of The Collaborative embodies this commitment for the DU students, faculty, and staff engaged in its work to the direct benefit of Coloradans through improved access to high quality and effective services. If DU is to serve the public good, it must break through the boundaries of campus and bring the resources of the university to the community. The mental health center we will create will exist in an underserved community, where it will increase accessibility and diminish traditional barriers to care.

A community-based mental health clinic as a hub for learning, service, and research will center and enrich the student experience through IPE and will have substantial local community impact. In addition, the potential for research and scholarship generation in the areas of evidence-supported interventions, reducing mental health disparities, and Interprofessional training and service provisions have the potential to benefit communities well beyond Colorado.

The work of The Collaborative is also highly aligned with the [Colorado Behavioral Health Initiative 2023 Strategic Plan](#) which employs a collaborative impact model.

### **What sources of external funding are available to support this issue area, i.e., federal and state grant funding, philanthropic funding, other?**

In collaboration with the GSSW, GSPP, MCE, and CAHSS advancement teams, we have identified philanthropic funding, both private and foundation/corporate that would align with this priority. Additionally, there are federal and state grant opportunities that would align well. The advancement teams collectively prepared a list of prospects including but not limited to Caring for Denver, Caring for Colorado, and the Anschutz Foundation. We are prepared to move

forward in garnering external funding through multiple sources. (*Prospective List Available Upon Request*)

**How sustainable is this project? Likewise, how sustainable is the funding stream after initial investment? Will it contribute to student interest and enrollments and to tuition revenue?**

The Collaborative is basing the sustainability of this endeavor on several key factors outlined below:

- In collaboration with the Departmental Advancement Offices, we are looking at long-term funding as well as 3-5 year grants.
- In keeping with DU's mission for the public good, we will utilize a sliding scale fee structure for billing. We will also bill Medicaid or Medicare for those who qualify. Existing DU clinics using this approach are financially stable, so we know client revenue can help be part of sustainability while offering sliding scales or Medicaid.
- Continuing education training for community-based therapists and other mental health professionals.
- New interprofessional programs, such as Board Certified Behavior Analyst (BCBA) or addictions certifications, which could be stand-alone or enhance current student experiences.
- Contracts with state and county groups for specialized services (e.g., conducting disability assessments, offering court-mandated domestic violence or substance use intervention).
- A new community-based DU mental health center could provide viable fundraising opportunities (e.g., naming the clinic, the building, the rooms, endowed chairs). This opportunity could be paired with specific interventions (e.g., PTSD, Eating Disorders, etc.), which might be more central to some donors.
- Revenue from grants/foundations centered through the Collaborative could enhance sustainability.

We believe that creating a community-based, integrated mental health center will be of incredible interest to students. Students are increasingly looking for ways to access hands-on, immersive learning while pursuing their graduate and undergraduate degrees. Being able to market opportunities for community-infused, interprofessional training will undoubtedly set DU apart from almost all of its competitors and contribute to student interest and enrollments.

In closing, the Collaborative is grateful for this opportunity to realize our vision through the Ideas to Impact initiative. Over the years, we have refined our mission, purpose, and values. We have operationalized our vision, sought guidance from community partners, faculty, staff, and students, and implemented interprofessional education and training at DU and beyond. We are ready and excited to move forward. Thank you.

## Center for a Regenerative Future, University of Denver

### WHITE PAPER LEADS – alphabetical order

- Sarah Bexell, Clinical Associate Professor, GSSW; Faculty Director, Center for Sustainability
- Dean Saitta, Professor of Anthropology; Director of Urban Studies
- Anna Sher, Professor of Biological Sciences; Director of DU-MERISTEM; co-lead of Global Environmental Change Institute
- Paul Sutton, Professor of Geography and the Environment; Climate Fresk Facilitator

**(Please see Appendix A for signatories of this white paper; all DU members are welcome.)**

### INTRODUCTION – Why this topic, why now?

Twenty thousand years ago *Homo sapiens* represented less than 1% of the mammalian biomass on Earth. Today we represent 36% of Earth's mammalian biomass and our livestock represent another 60%. Only 4% of Earth's mammalian biomass consists of wild mammals (Bar-On, Phillips, & Milo, 2018). This alarming expansion of humankind's impact on the biosphere is just one facet of what is described as *the 'Great Acceleration'* (Steffen, Broadgate, Deustch, Gaffney, & Ludwig, 2015) of socio-economic activities that are driving climate change, ocean acidification, land degradation, resource depletion, life altering pollution, and the 6th mass extinction. These global trends have created much human suffering and death and portend much more for the future if left uninterrupted. We are rapidly accelerating into an increasingly unstable, unsustainable, and undesirable situation unless immediate steps are taken to envision a different future that's informed by our best understanding of biophysical reality.

Envisioning an alternative future that remediates environmental degradation and human suffering requires heeding the wisdom of the Baseball Hall of Famer and People's Philosopher Yogi Berra: *'If you don't know where you're going, you'll end up someplace else'*. It requires identifying a broad suite of social, political, ecological, agricultural, industrial, educational, and urban practices that are *regenerative*, and mustering the collective will to implement them. Camrass (2020) emphasizes a definition of regenerative that is about rebirth, reformation, restoration, repairing of ecological damage and, perhaps most importantly, "reclamation of greater social choice." Current structural power is limiting and narrowing our choices for moving forward. The Center for a Regenerative Future (CRF) will leverage true expertise in the many areas that DU faculty work related to sustainability from the sciences, social sciences, and humanities. The CRF will challenge structural power and present 'choices' and 'alternatives' (grounded in biophysical reality) that are just, desirable, and sustainable.

Contemporary 'Green Growth', 'Smart Growth', and other development paradigms do not acknowledge the urgent need to address current climate realities and trends (IPCC, 2023) and are ill-equipped to do so. Alternatively, "degrowth" paradigms call for planned reductions of energy and resource use that bring populations and economies back into balance with the living world in just, equitable, and regenerative ways (Kallis, Paulson, D'Alisa & Demaria, 2020). It has been argued that degrowth will happen regardless of what we do, and that the challenge is how much we face up to it and take collective action to make it fairer and wiser.

Our proposed Center for a Regenerative Future will sponsor and promote a variety of activities including basic and applied research, curriculum innovation, science communication and environmental media making, and policy development for a re-imagined and regenerative future. The CRF will be transformative in its approach, and unique in the North American academy for its courage and capacity to face today's urgent challenges with an honest realism and practical idealism. It will be:

- Explicitly transdisciplinary and collectively owned.
- Cross-cultural and trans-historical in scope and approach to problem identification and Working Group formation.
- A dedicated space for Indigenous perspectives that are pioneering much Regenerative Futures work.

This proposal is responsive to student needs as well as a global moral imperative. Hickman et al (2021) in a survey of youth ages 16-25 across 10 countries and four languages found that nearly half of youth (n=10,000) surveyed state that climate anxiety impacts their daily lives, 75% say that 'the future is frightening', 64% said that their governments were not doing enough to avoid climate catastrophe, and 39% are hesitant to have children. Here at DU, within the Center for Sustainability, we have frequent discussions with students about the mental health ramifications of what they need to learn in courses ranging from biology to geography to social work about such issues as climate change and mass extinction. This content is not about the future, but the current state of Earth due to anthropogenic harms. Their anxiety about the current and future ability for Earth to sustain them is impacting many facets of their lives. Additionally, many young people are exploring alternatives to higher education, seeing the academy as antiquated, out of touch, and the debt incurred by attending as not worth their time and financial loss. They are urgently seeking mentors and role models willing and able to explore with them regenerative systems for working and living which the CRF will support.

Currently, the University of Denver has broad expertise in the areas of sustainability, conservation, and global environmental change, in the spheres of instruction, research, DU operations, and consulting (See Attached Figures, Pages 2-4), however it has not been well integrated (Page 1 of Figures). The Sustainability Council has been a mechanism in the past, but without enough support or power to engage all needed partners. Here we are proposing a new structure in which all activities related to these fields would be connected.

### **PUBLIC GOOD - *How does this topic further DU's commitment to the public good?***

The project of transforming the Center for Sustainability into an expanded Center for a Regenerative Future (CRF) honors the spirit of the university's Vision, Values, Mission, and Goals while updating them to meet the challenges of the modern age, including those related to global environmental change, massive human dislocations and migrations borne of climate change and economic deprivation, and rapidly growing cities awash with un-homed individuals and disenfranchised communities. These convergent, "terrific" trends (as described by scholars and activists in the Global South) have produced a crisis of habitability that's

unparalleled in human history (Escobar, 2019, 2022). The CRF will further DU's commitment to the public good by targeting the poly-crisis (Outlook for 2023 – Children in 'Polycrisis', 2023) with holistic, transdisciplinary approaches that forge a much closer connection between basic and applied research. It will serve as an incubator for curriculum and academic program development that engages with the alternative visions of habitability produced by decolonial and Indigenous critiques of traditional sustainability science (Sundberg 2014). It will explore, with students, new "imaginaries" for self and society, and produce what regenerative futures scholar Kimberly Camrass (2020) describes as "empowering narratives of hope and possibility." An example would be expanding upon the critical work of the Graduate School of Social Work in empowering and enabling community cohesion and mutual aid (<https://socialwork.du.edu/news/mutual-aid-collective>). The CRF will disseminate research results, innovative curriculum proposals, and policy briefs in modalities that can quickly reach broader publics and agencies, including via social media, video, and documentary film work, and modalities that perhaps were unforeseen by the original authors of our Public Good vision.

The original RFP for the Ideas for Impact initiative asked, "*How will this Big Idea change the world?*" The CRF's plan for changing the world is a bit more modest: *to foster a civilizational transition that begins to heal our ecosystems, cities, and Earth at large*. One way we intend to start tipping the scale is in addressing the student need for guidance by creating a forum within an institution that engages them in working towards a better future.

### **JEDI (JUSTICE EQUITY DIVERSITY AND INCLUSION)**

Jason Hickel, an anthropologist and author of *Less is More: How Degrowth Will Save the World* says that degrowth is, ultimately, a process of decolonization: of lands, peoples, and minds (Hickel, 2020). He says that it stands for "*de-enclosure of the commons, de-commodification of public goods, de-intensification of work and life, de-thingification of humans and nature, and de-escalation of ecological crisis*." This is a holistic and powerful view. It's a view that has clear implications for the university's fulfilment of JEDI commitments. It charts a path forward that will break from business-as-usual.

When a question was posed to a finalist in our search for a University Sustainability Officer about what degrowth would look like at DU, the answer had to do with eliminating plastic cups, lowering classroom temperatures, and taking other measures to reduce our carbon footprint. Although difference-making, this is instrumentalist thinking in service of a traditional sustainability agenda. Un-mentioned were much bigger issues like re-structuring academics and policy to better facilitate interdisciplinary teaching and research, promoting workload equity (an aspect of "de-intensifying" faculty life), evolving curriculum to accommodate Indigenous ways of knowing (e.g., moving from "Environmental Science" to "Environment and Land Studies"), elevating voices that are not currently privileged, and investing in student explorations of deceleration of the human footprint and embracing of ecological economics within human carrying capacity.

Scholars have demonstrated the importance of cultural diversity to the long-term resilience of human societies (Middleton, 2017; Turner et al. 2003). Compositional diversity is emerging as key to the long-term survival of American universities. DU acknowledges its settler-colonial history and high cost of attendance, which limits compositional diversity. While there are no easy solutions, we will start by hosting Working Groups on topics that matter to, or at least intersect with, the existential concerns of marginalized communities; e.g., environmentally-just urban planning, Indigenous Knowledge for climate change adaptation, biodiversity regeneration and healing, food sovereignty, and more. If we make serious efforts to decolonize the university in the ways described by Hickel and make concerted efforts to actively promote what the CRF stands for, that compositional diversity will follow.

More tractable than the challenge of increasing compositional diversity is the challenge of increasing inclusion of faculty, students, and staff in Regenerative Futures work. The Center's name signals accountability to all people, the diversities of life on Earth, and future generations of all species including our own. It signals a serious interest in engaging with Traditional Ecological Knowledge and Indigenous wisdom, theory, and practice. Having the CRF centrally housed and not within the domain of a particular academic unit, or under the control of a particular faculty, is a significant decolonizing move. It indicates a serious interest in fostering collective ownership, stewardship, and guardianship of the Center's activities.

It's been said, by scholars doing environmental justice work, that our greatest challenges are not scientific and technological (e.g., Engle et al. 2022). Rather, they go much deeper: they are spiritual (in E.O. Wilson's sense of the sanctity of nature) and cultural. To increase compositional diversity and foster inclusion at DU we need to create *social infrastructures* that are welcoming, inclusive of diverse world views and research/teaching agendas, and truly participatory. Upon achieving status as a high activity research university, DU adopted the motto "R1 Our Way" which promises a research environment that is invested equally in becoming and belonging. Establishment and promotion of the CRF will be one critical step in turning these visions into sustainable realities.

### **CRF (Center for a Regenerative Future) STRUCTURE AND FUNCTION**

We envision a leadership group to serve as the CRF's Executive Committee and would include the staff/faculty chairs of CRF Standing Committees dedicated to specific functions. See Figure 2 for details.

#### **Committees:**

- Executive Committee to coordinate and guide CRF sub-committees and guide decision making about structure and function
- Operations sub-committee to work with Facilities and the University Architect's Office
- Research and Grants sub-committee that explores funding in collaboration with various DU centers and institutes, and creates and coordinates external Working Groups

-Curriculum sub-committee that brainstorms academic program development in collaboration with leaders of academic units and Interdisciplinary Studies programs (majors and minors) that relate to sustainability and regenerative design

**Possible Additional Committees:**

- Data Visualization sub-committee
- Media Relations and Science Communications sub-committee
- Other standing committees established as needed/as the university requests

**Synthesis Working Groups:**

A primary function of the CRF will be to promote interdisciplinary research and application of knowledge through the creation of outward-focused and international Working Groups on critical topics germane to regenerative futures. Each of these would synthesize the available research on real-world problems of interest to donors and organizations, which would in turn be motivated to support their efforts.

Synthesis Working Groups will bring together experts from across our campus who have been largely siloed before now. Where appropriate, additional support from outside of DU will be sought to address specific needs. Examples of Working Groups and organizing research questions include the following:

Scientific Knowledge and Indigenous Wisdom

DU is home to Indigenous scholars already invested in bringing traditional knowledge to the forefront of tackling environmental injustices. Exploring common ground between Western/Scientific and Indigenous/Traditional approaches to regeneration is an unmet need and addresses two important goals: to learn from experience and expertise that has long been ignored, and to contribute to restorative justice for native peoples. At DU we have a particular obligation to listen and learn and ensure that the wisdom of Indigenous peoples is not lost.

Multi-species Entanglements

Modern human interactions with the more-than-human world is a scholarly interest that goes beyond the highly productive Institute for Human Animal Connection. A concern for more-than-human entanglements is forcefully emerging in fields from religious studies to anthropology to social work. What approaches to ecological justice recognize and respect the integrity of all species and their many interdependencies? Which ones promise a future with no more sacrifice zones?

Well-being Economies

What would an economy optimized for human and ecological wellbeing look like? Are there small-scale examples of regenerative economies that can be scaled-up into something more equitable and environmentally just (e.g., Spain's Mondragon Cooperatives)? What metrics would be appropriate for measuring resilience, desirability, sustainability, and equity? How



might governance have to evolve to establish and maintain an economic system that was designed to improve human wellbeing rather than economic growth as measured by GDP?

### **CRF DISTINCTIVENESS**

The most novel day-to-day operations would revolve around logistics planning for the Synthesis Working Groups. Dedicated staff will take care of the logistics. The CRF will bring together 8 to 15 people from different fields (scholars, practicing professionals, policymakers), at different career stages, and with different life experiences, and join them as a team to produce results that transcend their individual talents, skills, and expertise. Each team will take on a current “wicked problem” (proposed by the leaders of the team and approved by the CRF executive committee) and have two to three years to work on the problem. Over that time, the team will meet in the Community Commons at DU or at the Kennedy Mountain Campus (or both) three or four times for intense collaborative research sessions of 5 to 10 days. In between, team members will continue collaboration remotely. The working groups will integrate multiple sources of data and different perspectives to generate research insights that are difficult to achieve through the study of a single case or from a single perspective.

Other day-to-day activities will include grant-writing to support the activities of the Working Groups, in-house publishing to disseminate research results and policy pieces that don’t find their way into the scholarly literature (e.g., creation of a periodic papers series and a CRF blog), and academic program incubation that’s informed by the results of the synthesis work. Resident Fellows and post-docs will pilot courses and give research talks to the campus community. Numerous community outreach events are conceivable, e.g., public lectures, conferences, symposia, and film screenings (e.g., ‘Don’t Look Up’ on 4/19/2023) followed by live Q and A with film directors, producers, and subject matter experts. These kinds of events would be “value-added deliverables” inspired by Working Groups.

DU has faculty with considerable expertise in the subject areas covered by this proposal. These faculty have substantial external connections to scholars working in the United States and abroad. The University has, with its current Center for Sustainability, an established structure that can be re-tooled to better meet an expanded set of goals, and a dedicated staff that can be expanded to support new functions. More importantly, this established structure occupies neutral ground—independent of any single school, college or other academic unit—upon which transformative and transdisciplinary work can be collaboratively seeded, nurtured, and evolved.

DU may be compared with the following university-based initiatives related to Regenerative Futures work:

- Lyle Center for Regenerative Studies at Cal Poly-Pomona:  
<https://www.cpp.edu/env/lyle/index.shtml>
- Regenerative Futures Lab at the Kenan Institute for Ethics, Duke University:  
<https://kenan.ethics.duke.edu/regenerative-futures-lab/>

- Institute for Regenerative Futures in the College of Education, San Jose State University: <https://www.sjsu.edu/education/community/irf.php>
- Open Future Coalition: <https://www.openfuturecoalition.org/>

None of these initiatives compete with what we propose. All seem to recognize that our political and economic systems are broken and that we need to explore structural alternatives. However, Cal Poly-Pomona's center and Duke's lab are largely focused on small student group projects. San Jose State's center is largely focused on being an advocacy institution for East San Jose residents. Aiming for broader appeal and impact, DU's CRF will promote an inclusive approach to social and ecological justice. As part of this, CRF's initiatives are involved in assembling relevant scholarly expertise for synthetic research that is required for making substantive and meaningful systems change on local, national, and global levels.

Our Center leverages true expertise in the many areas that our faculty work on related to regeneration (from the sciences, social sciences, and humanities). Our Center will challenge structural power and present 'choices' and 'alternatives' (grounded in biophysical reality) that are just, desirable, and regenerative.

One of the ways that the CRF will be differentiated from similar centers and institutes that exist nationally is in its "deep historical" perspective on issues around sustainability and regeneration, i.e., its engagement with archaeological knowledge relating to *Homo sapiens* use of the landscape and our species' adaptation to global environmental change over the last 300,000 years. In recent decades, archaeology as a discipline has sought to play a larger role in addressing contemporary issues. However, its impact has been limited. One reason is the field's slow progress in packaging archeological knowledge in ways that make it useful for comparative scholarship and policymaking. Another is scientific and popular pre-conceptions that archeology has nothing to offer contemporary sustainability science and policy. For example, a 2018 [National Science Foundation report](#) on urban sustainability science does not include a single reference to cities that existed in the past (Advisory Committee for Environmental Research and Education 2018). This short-sightedness misses an opportunity to evaluate the relative efficacy of technological and socio-political responses to urban sustainability/regeneration challenges, i.e., to evaluate outcomes that can be directly detected in archaeological evidence.

The relevance of archeological and other kinds of historical studies to sustainability science, and their unique potential to inform policy, is currently being explored by the [Center for Collaborative Synthesis in Archaeology](#) (CCSA) at CU-Boulder. This Synthesis Center is explicitly based on the model developed by the National Center for Ecological Analysis and Synthesis (NCEAS). The CCSA is located within CU's Institute of Behavioral Science, an interdisciplinary community of social scientists committed to advancing knowledge of society's most pressing challenges and pursuing solutions through "innovative research, education, and engagement in the world." CCSA funds, supports, and promotes research that leverages the inherent strengths

of the archaeological record—the most extensive compendium of human experience available—to address general issues facing humanity.

Some of the CRF functions would be similar, in particular the use of the Working Group model to promote synthetic research. The work conducted by the CCSA is shaped by a philosophy that is geared toward the production of general knowledge and covering laws about human behavior, human-environment interactions, and human development over the long term. For example, one focus of CCSA work is urban sustainability. CCSA scholars utilize an analogy from mammalian biology to argue that all cities are 85% alike in the way they look, function, and evolve as a function of size. In other words, cities are viewed as scaled-up versions of each other in much the same way that a whale is a blown-up elephant, which is a scaled-up giraffe, all the way down to a mouse and shrew. Center scholars argue that the key to understanding cities, and solving their contemporary problems, depends on understanding these universal properties and not the 15% of contextual aspects—the specific details of local geography, history, culture—that make cities individually unique.

The CCSA's nomothetic perspective is valuable, and it's important to appreciate the generalizing significance and predictive powers of this approach. However, equally valuable is an idiographic perspective that drills into the specific details and "stories" of human experience and adaptation over the long term and examines how successful efforts to cope with environmental change can be scaled-up to meet contemporary challenges. At the end of the day it's the 15% of contingent, idiosyncratic variation in urban form that critically matters to the lives of individual citizens, especially the urban poor and other historically marginalized groups. This is the stuff—including the quality and distribution of housing, public space, green space, connecting arterials, cultural amenities, social infrastructure, and governing structures—that can be manipulated by human beings to make a difference in how cities work and adapt to changing circumstances. In contrast to the CCSA, the CRF's approach to questions of urban sustainability will invite contributions from a range of scientific and humanities disciplines, numerous urban planning and design professions, and bodies of Traditional Ecological Knowledge/Indigenous Wisdom from the world over.

The CRF will be distinguished by an approach to sustainability research and policy development that seeks to bridge scientific and humanistic, nomothetic and idiographic, quantitative and qualitative, and Western and Non-Western ways of knowing. This holistic approach will draw on expertise to be found across DU's schools and colleges and make distinctive contributions to the landscape of Regenerative Futures research, education, and outreach, including via multiple outlets, including media produced by a team of DU filmmakers.

## **FUNDING**

### Federal External Sources:

NSF (National Science Foundation) funds Synthesis Centers. The Department of Energy funds "Urban Integrated Field Laboratories". NEH (National Endowment for the Humanities) funds

‘Climate Smart Humanities Organizations’ and ‘Collaborative Research’. EPA (Environmental Protection Agency) funds ‘Environmental Sustainability’ and ‘Environmental Justice Thriving Communities’ and ‘Environmental Justice Collaborative Problem-Solving (EJCPS)’.

#### Foundations:

We’ve identified the Gates Family Foundation, Rose Community Foundation, the Alfred P. Sloan Foundation and Gaia Foundation as possible funding sources. We are currently in conversation with the Gaia Foundation.

#### Sustaining the Funding Stream:

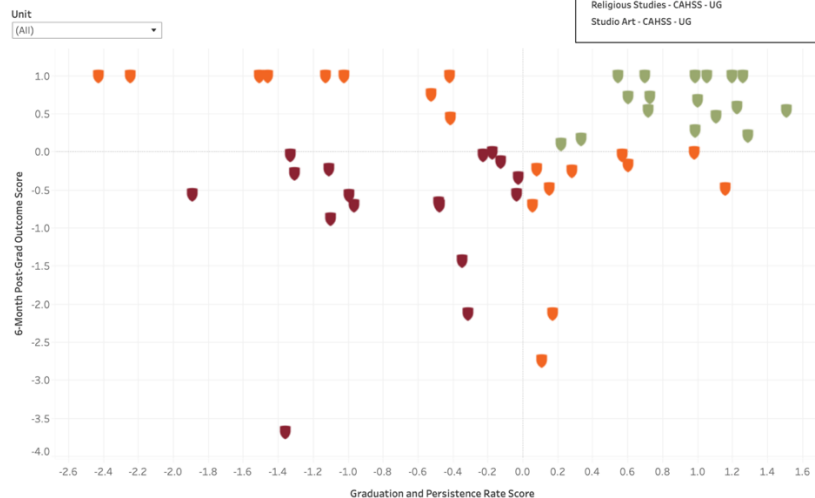
Globally, we’re facing student despair and fatalism. Our CRF initiative seeks to do something about that and in fact it has already begun through the creation of an undergraduate course to be offered through the Center for Sustainability in Winter Term 2024: *Eco-anxiety: From despair to action*. The Center for Sustainability is one of significant student engagement and enthusiasm. This critical foundation will be built upon as we grow our ability to respond to the youth mental health crisis through larger staff and programming supports and resources. The Center for Sustainability has become a trusted space among involved students, and we have the knowledge and the compassion to reach more students with appropriate resources.

The CRF will be an incubator of thought about new courses, curricula, degree programs, certificates, and more. These would have an inter- or trans-disciplinary character and establish cooperation between schools and colleges. The courses and programs can be structurally located wherever schools think it makes sense to place them. CRF personnel can help navigate the needed systems to bring these ideas to fruition.

In detailing the program incubation work, we propose using the results of the Academic Program and Unit Assessment (APUA) Task Force research that was conducted several years ago. The data indicate that interdisciplinary studies programs and other programs having an interdisciplinary character at DU are among the highest performers at the university. In fact, APUA Task Force members, appointed from units across the university, agreed that the relative success of interdisciplinary programming at DU is one of the strongest signals in a set of assessment data that is otherwise uneven in quality (see Figure 3). For example, the green shields in the upper right-hand quadrant of the APUA scatterplot provided below include a number of interdisciplinary programs such as International Studies, Public Policy, Integrated Sciences, and others. These data suggest that it would be wise to support interdisciplinary programs and degrees like those that might be incubated within the CRF.

### UG Student Success Quadrants

The plot below shows DU undergraduate programs in terms of positioning within quadrants associated with two measures of student success. The axes of the plot are standardized weighted mean composite scores. The x axis score weights the five-year average one-year persistence score at 25% and the four-year four or more year graduation rate at 75%. The y axis represents a six-month post-grad outcomes score. This score is the standardized ratio of proportion achieving a satisfactory outcome to the proportion with a satisfactory outcome or actively seeking employment/graduate education. Red shields represent lower than average performance on both composites while green shields represent higher than average performance on both composites. Hover over the shields for additional program details.



CRF personnel can use these and other performance data, including data on graduate programs, to brainstorm new programs that can address student despair while also creating new revenue streams. Students are interested in interdisciplinarity, and a focus in traditional disciplines can limit career choices. At the same time, faculty are often frustrated by the non-support of interdisciplinary programming at the university. The CRF would provide neutral territory for involving faculty from across campus in curriculum-building activity. Some possibilities:

- Evolve the Sustainability and Urban Studies minors into academic majors or combine them into a single major in a “target or niche” area. For example, Regenerative Futures thinking is at the heart of new sustainable urbanism scholarship that promotes “Seven Generation Cities” (Engle et al. 2022).
- Create a program in *Regenerative Design* (around housing, transportation, green space, etc.) that pulls from REBE, CAHSS and NSM;
- Create a graduate (PhD) degree program in *Urban Science and Policy* that draws from CAHSS, NSM, REBE, and Korbel (the Scrivner Policy Institute); This would combine some struggling PhD programs (as revealed by APUA analysis) into something new that might gain traction.
- Transform Environmental Sciences into an interdisciplinary and JEDI-conscious program in *Environment and Land Studies* (ELS) that would further our commitment to Indigenous students and stakeholders. Or, create an ELS concentration within the existing Environmental Sciences program.
- Grow the ecological justice concentration in the Graduate School of Social Work to additionally offer certificates or pathways for all mental health providers to be ‘climate

aware' in their practice and learn emerging techniques for addressing the growing mental health ramifications of global environmental change.

- Create a certificate in Science Communication & Environmental Filmmaking in partnership with the Department of Media, Film & Journalism Studies.

## SUMMARY AND CONCLUSION

There is an emerging consensus among scholars, and a widening realization among younger generations, that the concept of sustainability has exhausted its utility as a framework for creating a viable future for humanity. Alternatively, regenerative paradigms offer holistic understandings of Earth systems along with commitments to social and environmental justice. They support development of resilient communities that allow for wider economic prosperity and global environmental healing.

This White Paper proposes to reinvent the Center for Sustainability as the Center for a Regenerative Future. This reinvention involves incorporating elements of what's proven to be a successful "Synthesis Center" research model into Center functions and activities. The CRF will promote regenerative futures theory, design, and practice by utilizing concepts such as systems thinking, mutual aid, and Traditional Ecological Knowledge. It will sponsor an array of international research collaborations, interdisciplinary curriculum-building initiatives, and public outreach events and activities. We propose a publication series for policy briefs, and dissemination of expert knowledge in other modalities including traditional peer-reviewed scholarship and the visual and performing arts.

The Center for Regenerative Futures will build on the successes of the Center for Sustainability while simultaneously strengthening collaborative relationships with all academic units, centers and institutes on campus. The CRF will take advantage of Denver's unique geographical location and our urban and mountain campuses. Development of CRF programming should produce many opportunities for attracting external funding and philanthropic support.

## REFERENCES

Advisory Committee for Environmental Research and Education. (2018). *Sustainable Urban Systems: Articulating a Long-Term Convergence Research Agenda*. A Report from the NSF Advisory Committee for Environmental Research and Education. Prepared by the Sustainable Urban Systems Subcommittee.

Bar-On, Phillips, & Milo (2018). The biomass distribution on Earth. PNAS  
<https://www.pnas.org/doi/full/10.1073/pnas.1711842115>

Camrass, K. (2020). Regenerative futures. *Foresight*, 22(4), pp. 401-415. DOI [10.1108/FS-08-2019-0079](https://doi.org/10.1108/FS-08-2019-0079)

Engle, J., Agyeman, J., & Chung-Tiam-Fook, T. (editors) (2022) *Sacred Civics: Building Seven Generation Cities*. Routledge Equity, Justice, and Sustainable City Series.

Escobar, A. (2019). Habitability and design: Radical interdependence and the re-earthing of cities. *Geoforum* 101: 132-140.

Escobar, A. (2022). Reframing Civilization(s): From Critique to Transitions, *Globalizations*, DOI:10.1080/14747731.2021.2002673.

Hickel, J. (2020). *Less is More: How Degrowth Will Save the World*. Cornerstone Digital.

Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, R. E., Mayall, E. E., Wray, B., Mellor, C., & van Susteren, L. (2021). Climate anxiety in children and young people and their beliefs about government responses to climate change: a global survey. *Lancet Planet Health* 2021; 5: e863-73.

IPCC, 2023: *Climate Change 2023. Synthesis Report to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK and New York, NY, USA. <https://www.ipcc.ch/report/ar6/syr/>

Kallis, G., Paulson, S., D'Alisa, G., & Demaria, F. (2020). *The case for degrowth*. Polity Press.

Middleton, G. (2017) The Show Must Go On: Collapse, Resilience and Transformation in 21<sup>st</sup> Century Archaeology. *Reviews in Anthropology* 46 (2-3): 78-105

Outlook for 2023 – Children in ‘Polycrisis’. (2023, February 14). AllAfrica.com, NA. <https://link.gale.com/apps/doc/A737354338/HRCA?u=anon~8dffe473&sid=sitemap&xid=a3175ce9>

Steffen, W., Broadgate, W., Deustch, L., Gaffney, O. & Ludwig, C. (2015). The trajectory of the Anthropocene: The Great Acceleration. *The Anthropocene Review* 2(1): <https://journals.sagepub.com/doi/10.1177/2053019614564785>

Sundberg, J. (2014). Decolonizing Posthumanist Geographies. *Cultural Geographies* 21(1):33-47

Turner, N., I. Davidson-Hunt, and M. O’Flaherty (2003) Living on the Edge: Ecological and Cultural Edges as Sources of Diversity for Social—Ecological Resilience. *Human Ecology* 31 (3): 439-461.

## APPENDIX A

### DU Signatories:

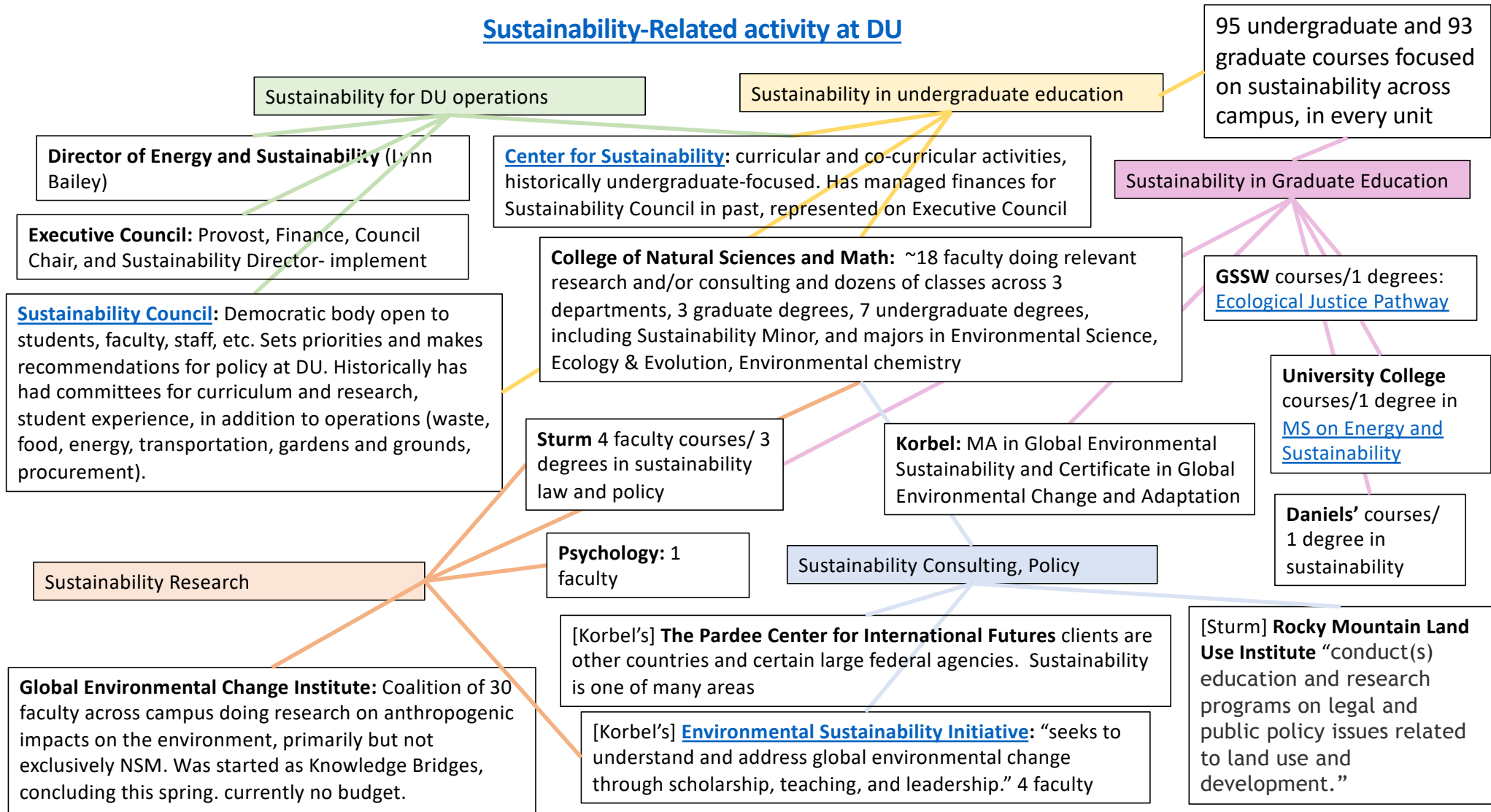
- Dennis Whittmer, Professor, Department of Management, Daniels College of Business
- Daniel Trujillo, Assistant Professor of the Practice, Franklin L. Burns School of Real Estate and Construction Management
- Aimee Hamilton, Associate Professor; Destiny Capital Faculty Fellow, Department of Management
- Donald Mayer, Professor of the Practice, Department of Business Ethics and Legal Studies

- Vivek Choudhury, Dean, College of Business
- Alana Inlow, Teaching Assistant Professor, Sociology and Criminology, College of Arts Humanities and Social Sciences
- Eric A. Holt, Assistant Professor, Franklin L. Burns School of Real Estate and Construction Management
- Nathan McNichols, Chair of Sustainability Council
- Helen McGrath, Vice-Chair of Sustainability Council
- Annabeth Headrick, Associate Professor; Director, School of Art & Art History
- Cara DiEnno, Executive Director, CCESL
- Tom Romero, Faculty Director, IRISE; Associate Professor of Law
- Lynn Bailey, Director of Energy and Sustainability, Facilities Management and Planning
- Shannon Murphy, Professor, Department of Biology; co-lead of Global Environmental Change Institute
- Laura Perille, Executive Director, 4D Experience
- Julia Senecal, Assistant Director, Center for Sustainability
- Derek Brannon, Program Coordinator, Center for Sustainability
- Kevin Morris, Executive Director, Institute for Human Animal Connection
- Justin Marceau, Professor, Sturm College of Law
- Yavuz Yaşar, Professor & Director of Graduate Programs, Department of Economics
- Claude d'Estrée, Professor of International Law and Human Rights, Korbel
- Hillary B. Hamann, Teaching Professor, Sustainability Minor Director, Department of Geography & the Environment
- Kelly Fayard, Assistant Professor, Anthropology
- Rachel Forbes, Clinical Associate Professor, GSSW; Director, GSSW Glenwood Springs Campus
- Julie Morris, Teaching Professor, Department of Biological Sciences
- Joe Brown, Associate Professor, Department of Media, Film & Journalism Studies
- Ellwood Colahan, Associate Professor and Music & Performing Arts Librarian
- Lenore Alvarez, Grant Coordinator, Graduate School of Social Work
- Drew Mueller, Associate Professor, Burns School of Real Estate & Construction Management
- Jared Del Rosso, Associate Professor, Sociology and Criminology
- Jonathan Sciarcon, Associate Professor, Chair, History
- Tamra Pearson d'Estrée, Professor of Conflict Resolution, Director, Conflict Engagement and Resolution Initiative, Korbel
- Susan Daggett, Professor of the Practice of Law; Executive Director, Rocky Mountain Land Use Institute
- Amin Khodaei, Professor, Ritchie School of Engineering and Computer Science
- Juan Carlos Goethe Lopez, Associate Professor, Department of Economics

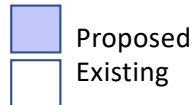


- William (Bill) Philpott, Associate Professor, History
- Anne DePrince, Associate Vice Provost of Public Good Strategy and Research
- Fritz Mayer, Dean of Joseph Korbel School of International Studies
- Andrei Kutateladze, Dean of College of Natural Sciences and Mathematics
- Michelle Sabick, Dean of Ritchie School of Engineering and Computer Science

## Sustainability-Related activity at DU



**Center for Regenerative Futures:** The proposed new coordinating body for all relevant programs at DU, replacing the Center for Sustainability, with full time hired leadership and administrative support. Responsible for coordination, communications, outreach, etc. It will encourage and centralize donations and facilitate connections with policymakers and other community partners through symposia and publications. Would manage website with links to all related institutes and activities at DU relevant to this space.



**Sustainability Council:** The democratic body by which the DU community comes together quarterly to vote on initiatives, stay informed, and advise the administration regarding sustainability at DU. As in the past, *this group would evaluate and vote on proposals from the various programs on campus for funding*. Task force groups formed on an as-needed basis work on projects primarily focused on DU operations, but may include any of the following three areas:

#### Policy/consulting

**Regenerative Futures Working Groups:** These would be interdisciplinary, topic-focused groups with paid representation from existing research and policy bodies on campus. These groups would be think-tanks for interdisciplinary research and advertised as resources for consulting and education (McKinsey model).

[CNSM] **Global Environmental Change Institute**

[Korbel] **Climate and Society**

[Sturm] **Rocky Mountain Land Use Institute**

#### Research

#### Degrees and Certificates

**Graduate-level:**  
13 different [degrees and certificates](#):

- College of Natural Sciences and Math (3)
- Korbel School of International Studies (3)
- Sturm College of Law (3)
- Daniels College of Business (1)
- Graduate School of Social Work (1)
- University College (1)

**Undergraduate:**  
7 different BA and BS degrees in 3 departments within College of Natural Sciences and Math

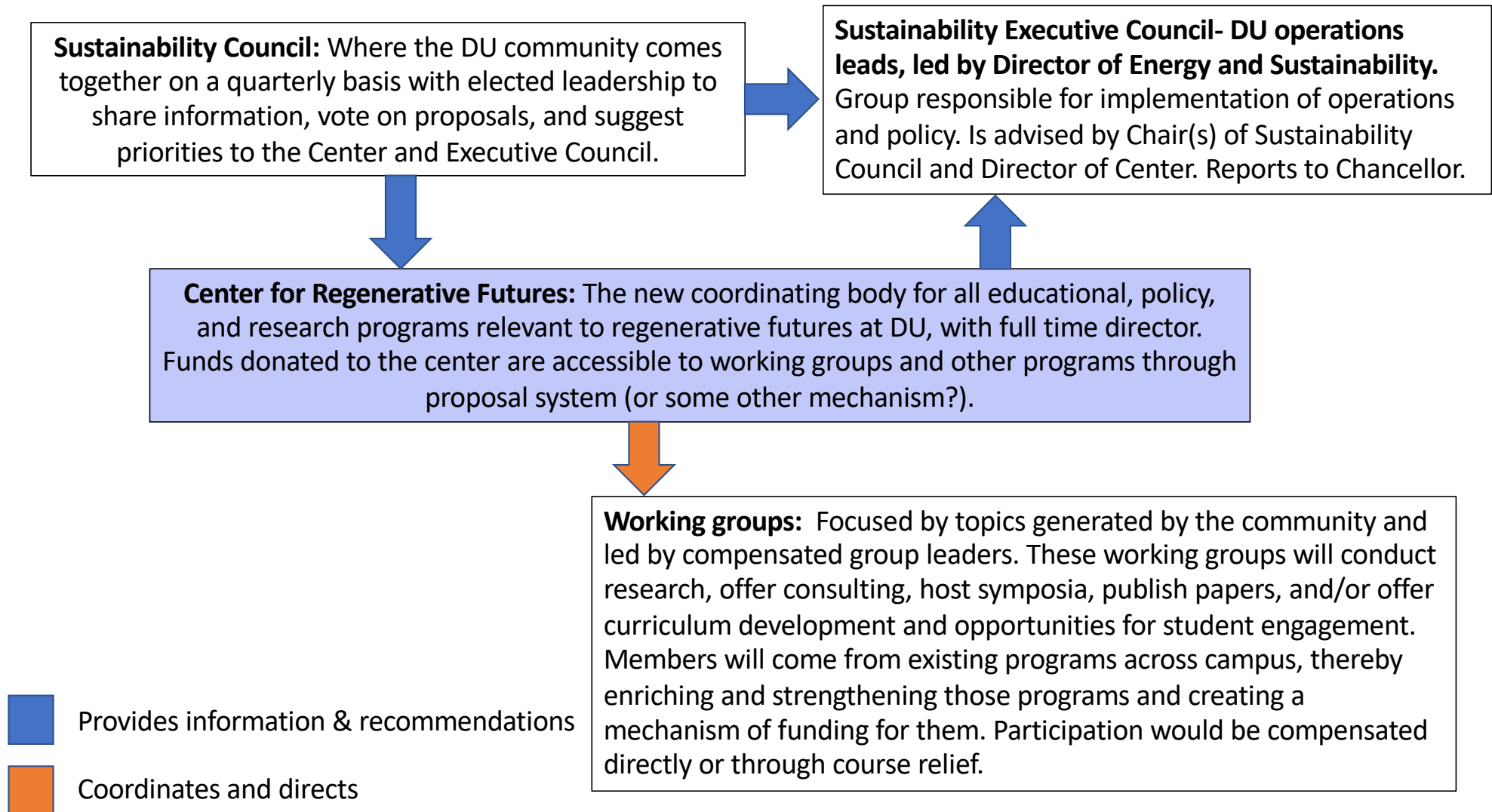
**Ensure that all departments include elements of sustainability in courses**

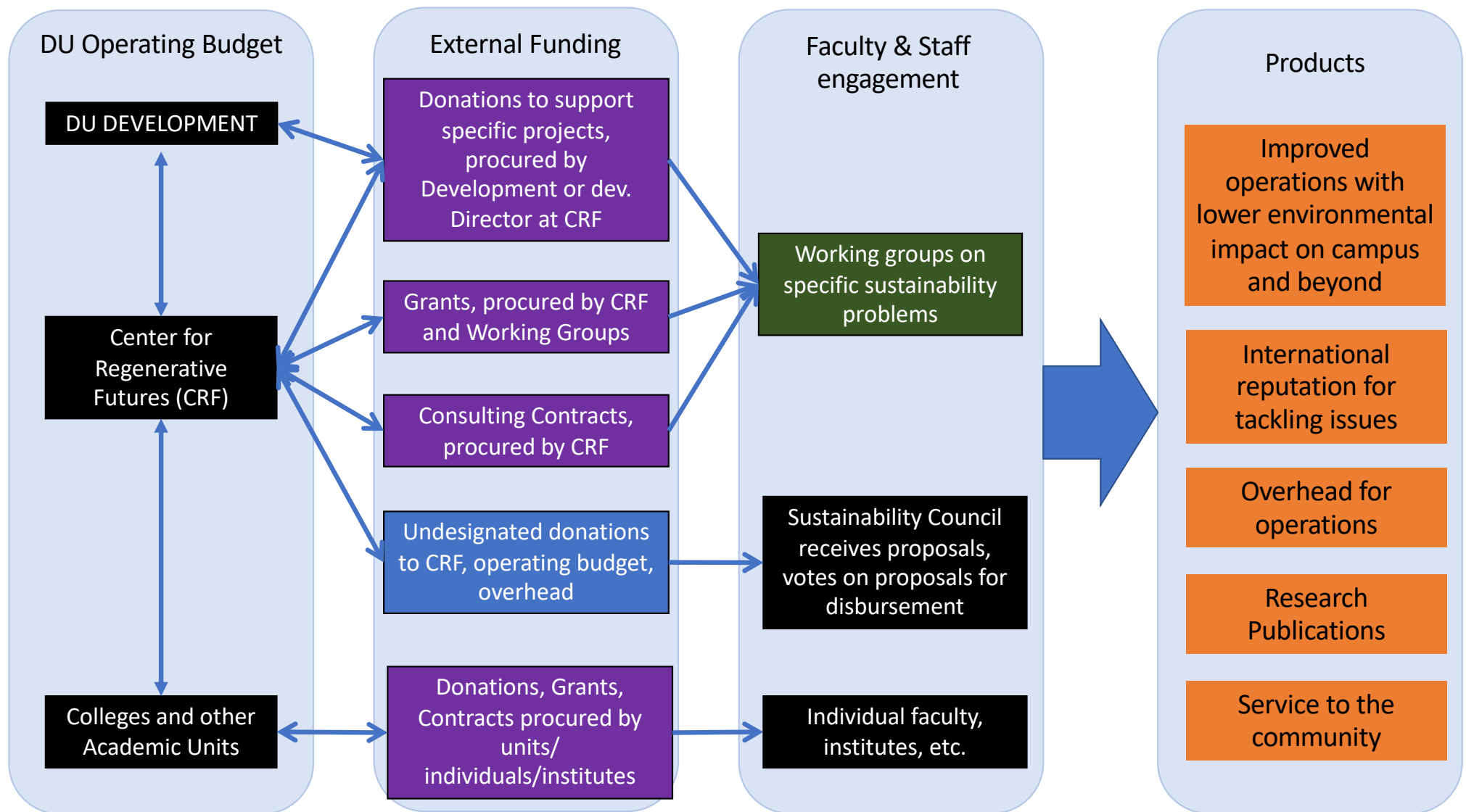
#### DU Operations

**Director of Energy and Sustainability** (Lynn Bailey)

**Sustainability Executive Council-** responsible for implementation of DU operations and policy. Is advised by Chair of Sustainability Council (elected, with stipend) and Director of Synthesis Center (appointed and salaried). Makes recommendations to the Chancellor and BOT.

**Sustainability Council Task Force Groups:** These are action-oriented committees created as needed with specific goals. They have already begun.





## **Center for Pathways to Access and Equity in Education (CPAEE)**

### **I. Introduction**

Educational access and equity are fundamental human rights. All people deserve access to high quality education that allows them to thrive and reach their full potential. Yet, educational inequities persist in the U.S. and globally based on demographic factors including race, class, and gender. Scholars proclaim that educational achievement gaps veil the real issue—educational opportunity gaps (Flores, 2007). That is, there is a lack of opportunity to access experiences that promote equity in educational attainment.

A substantial body of research indicates that educational attainment impacts civic engagement, and health and economic outcomes, to name a few. Specifically, educational attainment impacts civil and social engagement, including the development of civic skills, social communication, and community volunteering (Desjardins et al., 2006). Researchers add that increased educational attainment results in healthy lifestyles and longer lifespans (Zajacova & Lawrence, 2018). This is particularly the case for diverse communities that are historically underserved, including, but not limited to, FirstGen, BIPOC, rural, and low-income. Research also shows that preschool education reduces social inequalities in educational achievement (Cebolla-Boado et al., 2016). Moreover, economic outcomes related to educational attainment include higher wages, increased economic productivity, and decreased unemployment (Donaldson et al., 2023).

Educational transitions occur across a person's lifespan and can be important entry points or gatekeepers to educational attainment. In some nations, the entry point is pre-school—in the U.S. often conceptualized as ages 3 to 2<sup>nd</sup> grade. Transitions happen across schooling from elementary to secondary schooling. Post-secondary schooling continues for some, including nontraditional enrollment across the lifespan. Moreover, there are those who strive to learn well beyond retirement, stretching their curiosity in ways they could only imagine. Educational transitions reflect the progression and development of a life-long educational journey. This may include advancing to higher grades and levels of education, participating in specialized studies, and exploring novel educational activities and modalities for learning. Educational transitions happen inside and outside of formal institutions for learning. They happen in families, communities, nature, and in one's imagination. They are mediated by one's cultural ways of knowing and being in the world. One can learn from an elder, a beaver, a river, a rock, a teacher, or a college professor, to name a few. Education in its broadest sense is limitless and knows no boundaries.

Challenges exist in educational transitions across the lifespan. The transition from middle to high school presents students with challenges including increasingly rigorous academic expectations, desire for independence and autonomy, ethnic and gender identity development, and peer pressure (Betha-Hampton & Wilson-Jones, 2018). Post-secondary education may also present challenges, including an increased need for time management skills and the discipline to meet academic expectations amidst increased independence and self-accountability. For career changers, the stress of going back to school or updating career skills can lead to parenting strains, stressors related to time constraints, and increasing debt (Kirby et

al., 2010; Stergiou & Airey, 2018). Retirement can bring a new slew of challenges and opportunities related to learning, identity development, and self-care (Bordia et al., 2020).

Educational transition programs can help people surmount challenges that create obstacles to academic and life success (Sapp, 2009). Programs dedicated to educational transitions can support human development, reduce dropout rates, increase higher education attainment, contribute to preparation for diverse learning and working environments, and promote wellness (Colorado Department of Education, 2019; Donaldson et al., 2023; Johnson et al., 2017). Moreover, transition programs prepare people to reach their maximum potential by identifying appropriate supports and services that advance equity and access, community engagement, and success (Jones, 2021).

U.S. and global educational landscapes are changing. U.S. Institutions of Higher Education (IHEs) are facing new demographic challenges with aging adults and increasingly diverse youth. The value of a college education has come into question in a post-pandemic economy that is replete with job opportunities and declining post-secondary enrollments. The research literature also points to changing views of fields, jobs, and roles that are deemed essential (Fields, 2022). As sectors of the labor market evolve, partly based on the demand for workers amidst numerous unfilled roles, higher education institutions must accommodate this pivot by evaluating their value propositions, creating innovative opportunities, and diversifying pathways and points of access for formal education. It is essential to reconceptualize pathways for access and equity across educational transitions. What does educational equity and access look like in birth, in pre-school, in early years, in adolescence, in adulthood, in retirement? How has equity and access changed? Where are we now? Where are we going? What is our dream and how do we make it come true? It is more vital than ever to create pathways to access and equity across educational transitions in the U.S. and globally. Such pathways begin from birth to pre-school, continue to early years and adolescence, advance in post-secondary and career, and continue to thrive in retirement and beyond.

DU has the capacity, intellectual resources, and human capital to be the nucleus of access and equity in educational transitions across the lifespan—in the Rocky Mountain Region and beyond. However, these efforts are dispersed and not connected across schools, colleges, and units. MCE has nationally and internationally renowned scholars with research and practice expertise in areas of critical data and policy; culturally responsive evaluation; educational transitions across the P-20; education and health equity; and preparation of diverse professionals in education and health fields. MCE's vision is to be a global leader in innovative and effective approaches for promoting learning throughout the lifespan. MCE promotes educational change and equity through education, mental health, and information services and systems. UCOL builds innovative partnerships that serve the public good by providing alternative educational pathways that provide access to learner populations that might not otherwise engage with the University. This includes non-credit technology boot camps, a partnership with World Trade Center providing business skills for migrant communities through the Center for Professional Development, and a partnership with Prodigy Coffee House for apprentices to attend UCOL Frontline Manager Leadership program. MCE, GSPP, GSSW, CAHSS, CRSHE, and the Knoebel Institute for Healthy Aging advance equity through wellness initiatives. CAHSS faculty engage in research, scholarship, and teaching that explores and fosters educational equity. IRISE supports educational equity through various initiatives including Visiting Community Scholars, Post-Docs, and the RAGE Podcast. CCESL addresses big challenges through connected, community-engaged, equity-focused initiatives.

The Ideas to Impact grants and DU's 4D experience may be catalysts to build interdisciplinary connections across DU units. The Ideas to Impact grants create opportunities for collaboration through funding and support. DU's 4D provides a common language and roadmap to success. DU community members lead purpose-driven lives dedicated to the public good. DU has an opportunity to expand its public good impact with historically marginalized communities by eliminating barriers, challenging systemic inequities, and developing equitable solutions. DU is known for using innovative strategies to solve complex social challenges facing our country and the world, attracting students, staff, and faculty with strong character, a commitment to the public good, and a desire to advance their intellectual growth. MCE, UCOL, and DU are shining examples of the 4D, as exemplified by life-long learning opportunities; workforce development; DEIJ programmatic efforts; recruitment and retention of diverse students, staff, and faculty; community-engaged research and scholarship; and mutually beneficial community partnerships.

## II. Proposal for a Center

The *Center for Pathways to Access and Equity in Education* (CPAEE) will explore and enrich educational transitions across the lifespan from early childhood education to retirement through a focus on 4 developmental pathways.

- Birth to Pre-school
- Early Years to Adolescence
- Post-secondary & Career
- Post-career, Retirement, & Beyond

CPAEE will lead advancements in the pathways through the following initiatives:

- **Academic Preparation:** Develop courses, micro-credentials, curricular concentrations, and education major/minor, with an emphasis on educational equity and access in and across the pathways.
- **Diversifying the Workforce:** Expand BIPOC representation in education and health professions (e.g., teachers, paraprofessionals, school leaders, school psychologists, librarians, counselors, social workers, researchers) in the pathways through innovative, inclusive, and culturally responsive strategies, models, and programs.
- **Wellness:** Design and implement culturally responsive models that promote wellness across the pathways, including, but not limited to, prenatal care; early childhood thriving; positive identity development; cultural knowledge and pride; physical, mental, and spiritual health; healing historical trauma; self and community care; financial literacy; and life care.
- **Best Practice in Local and Global Contexts:** Examine, synthesize, and disseminate best practice in educational access and equity along the pathways in local and global contexts including community forums and case studies of statewide, regional, urban, rural, suburban, and international exemplars.
- **Research & Policy:** Develop and test community-engaged, critical research, policy, and evaluation frameworks and models that challenge inequality and foster educational access and equity across the pathways. Critical and community-engaged research centers inquiry



in communities and examines the role of power and social position within phenomena (O'Brien, et al., 2022). This includes using statistical data and quantitative inquiry to unveil oppressive practices and propose community-engaged and justice-oriented solutions.

The University of Denver's CPAEE will dramatically reimagine pathways to access and equity in education across the lifespan. CPAEE is designed to foster collaboration across DU schools, colleges, and units resulting in transformative change in education and wellness inside and outside of DU. We seek funding to build strategic connections within and beyond DU. The pathway initiatives will be developed using a phased approach. In Phase 1, a steering committee of interdisciplinary DU faculty and community partners will be established. In Phase 2, interdisciplinary teams will be selected to participate in Collective Impact Cohorts to develop goals and an action plan for each pathway. In phase 3, teams will implement and evaluate the action plan. In phase 4, teams will research the impact of their initiatives and disseminate their findings using traditional forms of academic scholarship and public scholarship. In phase 5, the teams will secure funding to maintain the initiatives and build sustainability mechanisms. Once the process is complete, the new teams will be selected to continuously improve practices and processes and engage in new actions that advance pathway initiatives. CPAEE will result in the following outcomes:

1. assess current pathways curricular offerings, design education minor/major, create curricular offerings integrating DEIJ and educational access and equity in pathways—resulting in increased enrollment;
2. increase number of BIPOC educators and health professionals as evidenced by admissions and degree/course completion data;
3. design and test culturally responsive measures of educational equity and wellness (e.g., validated scale and administered questionnaires)
4. convene community forums on the educational access and equity pathways and synthesize and disseminate findings;
5. launch an interactive, open access clearing house of educational access and equity pathways research and exemplars using traditional modes of scholarship and public scholarship;
6. develop, research, and disseminate community-engaged, critical research and policy models, frameworks, and scholarship; and
7. secure external funding to support and sustain initiatives.

### III. Advancing DEIJ & Public Good

In Chancellor Haefner's statement on DEI, he states that "we must continue to strive for an inclusive community that embraces all its members, provides equality of opportunity for all and actively encourages all voices to be heard." CPAEE is created to provide opportunities for all through a focus on equitable education and wellness. Moreover, CPAEE aligns with DU's DEI action plan. Specifically, the focus on professional preparation aligns with Impact Area 3: Invest in and provide training for students, staff, and faculty. CPAEE also aligns with Impact

Area 5: Launch university-wide programming to explore a more equitable future as this initiative is focused on a university-wide collaboration to build a more equitable community, nation, and world. CPAEE advances research and knowledge through the exploration, development, implementation, and evaluation of models, programs, and practices that advance pathways to education access and equity. Moreover, this collaboration impacts historically marginalized communities through a focus on research and practice that is explicitly focused on advancing their educational attainment and well-being. This collaboration impacts the recruitment and retention of BIPOC DU students and professionals through the development of DU programs designed to prepare BIPOC professionals to lead in their respective fields. Last, a focus on education access and equity is a public good that can span urban, rural, and suburban communities; local, national, and international contexts; and human development across the lifespan.

#### IV. External Funding Sources

The creation of CPAEE, and its interdisciplinary design, require a \$10M financial commitment over five years to design, launch, and succeed in this endeavor. With the current state of educational access and equity, we believe that major donors will be interested in partnering with us on re-imaging education access and equity pathways. We believe that an interdisciplinary endeavor of this magnitude will provide opportunities to engage foundations and individual donors who invest in collaborative processes to advance educational access and equity. There are numerous funding opportunities aligned to CPAEE, including:

##### Foundations

###### *National*

- Robert Wood Johnson Foundation's [Evidence for Action: Innovative Research to Advance Racial Equity](#)
- [W.K. Kellogg Foundation](#) whose priorities include thriving children, working families, and equitable communities
- [William T. Grant Foundation](#) who has several grant opportunities including an institutional challenge grant that "encourages research institutions to build sustained research-practice partnerships with public agencies...to reduce inequality in youth outcomes" and research grants on reducing inequality.
- [Carnegie Corporation of New York](#) which has grant opportunities related to new designs to advance learning, pathways to postsecondary success, and equitable systems.
- [Spencer Foundation](#) supports racial equity research, small-and-large scale research, and research practice partnerships.
- [Hewlett Foundation](#) supports educators, schools, and communities turn schools into places that empower and equip every student for a lifetime of learning, and to expand access to open educational resources.
- [Emerson Collective](#) centers their work on education with the understanding that the challenges we face as a society are deeply interconnected.

- Ascendium [Foundation](#) is working to change postsecondary and workforce training systems so that low-income learners have the same opportunities for academic and career success.
- Lumina Foundation focuses on helping to design and build an equitable, accessible, responsive, and accountable post-high school education system for all.
- Foundations Represented in the Presidents’ Council on Disability Inclusion in Philanthropy (Ford Foundation, Doris Duke Charitable Foundation, Kresge)

### *Colorado*

- [Gates Family Foundation](#), a Denver-based organization offering grants related to innovative learning environments, school system innovation, and conditions for sustained innovation
- [Gary Community Ventures](#) partners with our community to reshape the arc of opportunity for Colorado kids and families.
- [Buell Foundation](#) directly supports the healthy development of very young children between the ages of zero and five
- [Daniels Foundation](#) which prioritizes early childhood education, K-12 education, youth development, and aging
- [El Pomar](#) which has the following focus areas: arts and culture; civic and community; education; health and human services
- Community Foundation grants and DAF donations – Rose, Denver, Boulder and rural
- Next50 initiative supports efforts to ensure older adults have everything they need to thrive

### Federal Agencies

- [National Science Foundation’s](#) grants on advancing racial and gender equity in STEM,
- United States Department of Education including the [Institute of Education Sciences](#) which funds a wide range of areas in education research and training
- [National Institutes of Health](#) which funds numerous areas related to racial equity, structural racism, and novel approaches to reducing disparities

### State Agencies

- [Colorado Department of Education](#) which funds efforts related to adult education, health and wellness, early literacy, postsecondary and workforce readiness
- [Colorado Department of Higher Education](#) which has grants to increase access to higher education

### Individuals

- Carrie Morgridge/Morgridge Family Foundation
- Lauri Hughes
- Nancy Gallavan
- Heather Dugdale

## V. Sustainability

This project is sustainable in that it will result in new and expanded academic programs and community partner collaborations, tuition funding to diversify BIPOC professionals, and support to advance sponsored research. Additionally, CPAEE core leaders will come from MCE and other DU units. This initiative will require a \$10 million dollar investment of \$2 million per year for five years. Funding will include the following:

- 2 course releases and stipend for a director (MCE or another DU unit) to oversee implementation and development of CPAEE
- 2 courses releases and stipend for a faculty research director (MCE or another DU unit) to oversee research initiatives and GRAs
- 2 staff members: communications, grants support
- 1 post-doc advance research and practice initiatives and collaborate in the development of the vision, mission, and goals of the Center
- 4 GRAs to support pathways
- annual retreat at the DU James C. Kennedy Mountain Campus for faculty and staff engaged in education and health equity research and programming
- affiliated faculty/staff stipends to support the development, implementation, and evaluation CPAEE pathways and initiatives
- Project coordinator
- Community forums
- Stipends for interdisciplinary team members

### **Team Lead(s): First/Last Name**

Dr. Michelle Knight-Manuel, Dean, Morgridge College of Education [Michelle.Knight-Manuel@du.edu](mailto:Michelle.Knight-Manuel@du.edu)

Dr. Michael McGuire, Dean, University College [Michael.McGuire@du.edu](mailto:Michael.McGuire@du.edu)

Dr. Maria Salazar, Associate Dean Faculty Affairs and DEIJ, Morgridge College of Education [Maria.Salazar@du.edu](mailto:Maria.Salazar@du.edu)

### **Team Members**

Amy Livingston, Director of Development

Dr. Elaine Belansky, Director Center for Rural School Health & Education & MCE Research Professor

Shevene Cole, DU MCE Graduate Assistant, Research Methods & Statistics Ph.D. student

### **Academic Schools/Units Involved in the Development of Project**

Team leads and members facilitated three sessions with MCE and DU faculty and staff from 9 DU schools, colleges, and units. The leads collected notes and identified common themes to

identify the pathways and areas of foci. This proposal was developed based on feedback from faculty and staff from the following DU schools, colleges, and units: MCE (Roncoroni, Schmidt, Anderson, Hafenstein, Stewart, Chao, Michalec, Tabron, Leonard, Belansky); University College (McGuire, Larson, Cragg, Rogers); CAHSS (Adamo, Stanton, Byron, Leahy; Feitz); GSSW (Scott, Mitchell); Sturm College of Law (Wiersema); Josef Korbel School of International Studies (Galembe); Natural Sciences and Mathematics (Arias); University Libraries (Farrell, Beuz, Trucks, Solis). These faculty and staff have strong expertise in the areas of:

- professional preparation of BIPOC educators (MCE; ECHO-DU; GSSW, GSPP; CAHSS);
- workforce and career development (UCOL, Daniels College of Business, Career and Professional Development);
- mental health in marginalized communities (CRSHE, IRISE, GSPP, MCE, GSSW);
- lifespan emphasis (UCOL, Knoebel Institute for Healthy Aging; GSPP, GSSW);
- STEM in education (MCE, NSM, Ritchie School of Engineering and Computer Science; E-STEM; CAHSS Emergent Digital Practices);
- Critical, culturally responsive research methods (MCE, GSSW, GSPP)
- community engagement (MCE, IRISE, Latinx Center, IRISE, CCESL);
- school-to-prison pipeline (GSPP, GSSW, Sturm College of Law); and
- global education (Korbel, MCE)

## Appendix A: References

- Bethea-Hampton, T. & Wilson-Jones, L. (2018). A narrative study on high school transition programs and student attendance in rural North Carolina, *Journal of Research Initiatives*, (3)3. Retrieved from <https://digitalcommons.uncfsu.edu/jri/vol3/iss3/1>
- Bordia, P., Read, S., & Bordia, S. (2020). Role identity processes in retirement transition. *Journal of Organizational Behavior*, 41, 445-460. <https://doi.org/10.1002/job.2438>
- Colorado Department of Education. (2019). *Transition programs*. CDE. Retrieved from <https://www.cde.state.co.us/dropoutprevention/bpguide-transition>
- Desjardins, R., Schuller, T., Feinstein, L., Sabates, R., & Campbell, D. (2006). Measuring the effects of education on health and civic engagement: Proceedings from Copenhagen Symposium. *UCLA*. Retrieved from <https://escholarship.org/uc/item/6h84705f>
- Donaldson, C., Moore, G. & Hawkins, J. (2023). A systematic review of school transition interventions to improve mental health and wellbeing outcomes in children and young people. *School Mental Health* 15, 19–35. <https://doi.org/10.1007/s12310-022-09539-w>
- Fields, H. Evidence-based study: The effect of the COVID-19 pandemic on post-secondary enrollment and chosen fields of study" (2022). *Student Research*, 50. <https://scholarship.depauw.edu/studentresearchother/50>
- Flores, A. (2007). Examining disparities in mathematics education: Achievement gap or opportunity gap? *The High School Journal*, 91(1), 29-42.
- Johnson, V. L., Simon, P., & Mun, E. Y. (2014). A peer-led high school transition program increases graduation rates among Latino males. *The Journal of Educational Research*, 107(3), 186–196. <https://doi.org/10.1080/00220671.2013.788991>
- Jones, C.B. (2021). Post-Secondary Success in Relation to Transition Programs. *University of New England*, 392. Retrieved from <https://dune.une.edu/theses/392>
- Kirby, P. G., Biever, J. L., Martinez, I. G., & Gómez, J. P. (2004). Adults returning to school: the impact on family and work. *The Journal of Psychology*, 138(1), 65–76. <https://doi.org/10.3200/JRLP.138.1.65-76>
- Link, B. G., & Phelan, J. (1995). Social conditions as fundamental causes of disease. *Journal of Health and Social Behavior*, 80–94. <https://doi.org/10.2307/2626958>
- Ma, J., Pender, M., & Welch, M. (2016, November 30). Education pays 2016: The benefits of higher education for individuals and society. trends in higher education series. *College Board*. Retrieved from <https://eric.ed.gov/?id=ED572548>

- O'Brien, D., Nygreen, K., & Sandler, J. (2022). Theorizing relationships in critical community engaged research: Justice-oriented collaborations as resistance to neoliberalism. *Journal of Higher Education Outreach and Engagement*, 26(3).
- Sapp, J.S. (2009). Barriers to High School Student Academic Success. *Georgia Southern University*. Electronic Theses and Dissertations. Retrieved from <https://digitalcommons.georgiasouthern.edu/etd/365>
- Stergiou, D.P. & Airey, D. (2018). Returning to education: a stressful experience?  
In V.V. Cuffy, D. Airey, & G.C. Papageorgiou (Eds.), *Lifelong learning for tourism: concepts, policy, and implementation*, pp. 51-69. Routledge.
- Zajacova, A. & Lawrence, E. M. (2018). The relationship between education and health: Reducing disparities through a contextual approach. *Annual Review of Public Health*, 39,273-289. <https://doi.org/10.1146/annurev-publhealth-031816-044628>

## The Denver Climate and Society Initiative (DCSI)

A Proposal Submitted to the University of Denver's Ideas to Impact (I2I) Initiative  
April 14, 2023

Climate change is among the most complex and urgent challenges of our lifetimes and that of our students. Mitigating its magnitude and adapting to a changing climate will demand ingenuity and sustained commitment, along with well-educated, well-trained leaders to effect social and structural change. The University of Denver is uniquely situated to launch an ambitious, innovative, and impactful Climate and Society Initiative that reimagines interdisciplinary teaching, research, and public engagement on the societal impacts of the climate crisis and the political, economic, and societal responses to it.

The initiative will draw on DU's distinctive strengths, among them: environmental justice; climate impacts on migration, security, water resources, food insecurity, democracy, and other societal concerns; and the roles of governments, businesses, and civil society organizations in responding to the climate challenge. The initiative is a clear example of DU's commitment to the public good. It will leverage the unparalleled resources available in the Front Range, including complementary strengths at other universities in the area, the numerous of federal labs in the area, the concentration of energy and environmental businesses, non-governmental organizations and thinktanks, and our access to public officials. Combined, these attributes make this area perhaps the single best location for such an initiative.

Key elements of the program will include:

- Curricular innovations to prepare the next generation to live and lead in a world reshaped by climate change;
- Impactful research to advance our understanding of the societal dimensions of the climate crisis; and
- Engagement with policymakers and stakeholders to inform local, state, national and global solutions to the climate crisis.

Many universities have recently made substantial commitments to climate change. Most, however, are focused on science and technology rather than on societal impacts and societal responses. Yet, as the recent IPCC report makes abundantly clear, the fundamental problem now is not to understand the environmental impacts of climate change, but rather to galvanize the collective will needed to minimize and mitigate its impacts. Furthermore, few universities are exploring the intersectionality of climate change by integrating DEI considerations in teaching, scholarship and public engagement. We believe this initiative will position DU as a national and international thought leader on just those issues. DU will be both model for climate education and a exemplar of an engaged university committed to advancing the public good on this, perhaps humanity's most vexing problem.



## **A Cross-Campus Collaboration**

This proposal represents a collaboration of five colleges and schools, but it will engage with virtually every unit on campus. Those primary collaborators are the College of Arts, Humanities and Social Sciences; the Daniels College of Business; the Graduate School of Social Work; the Korbel School of International Studies; and the Sturm College of Law. The lead faculty for those units are:

Susan Daggett, Sturm College of Law  
Frank Laird, Korbel School  
Lisa Reyes Mason, GSSW  
Fritz Mayer, Korbel School  
Tricia Olsen, Daniels College of Business  
Andrea Stanton, CAHSS

We also envision significant engagement with the Department of Geography and the Environment within the College of Natural Sciences and Mathematics, which has a strong human geography focus.

This initiative is designed to build on the remarkable range of existing efforts on climate change and society at DU. These include myriad centers, degree and certificate programs, student activities, and faculty initiatives happening in nearly every academic unit on campus as well as in the Center for Sustainability. Those include, in addition to the Sustainability Center and the Department of Geography and the Environment, the Center for Global Change, the Center for Migration, the Sie Center for Security and Diplomacy, IRISE, the Pardee Center for International Futures, the Rocky Mountain Land Use Institute, the Scrivner Institute of Public Policy, the Nanda Center for International and Comparative Law, the Estlow Center for Journalism and New Media, and others. The initiative is also intended to reinforce the strategic plans of the colleges and schools, almost all of which have some element related to climate change and society. This project will provide the resources to strengthen those programs and build collaborative networks within and outside of the university.

We note that we see the I2I proposal for a Synthesis Center on Regenerative Futures submitted by a team led by Professor Bexell as a potentially complementary initiative that would help facilitate even wider coordination and information sharing at DU.

## **Why “Climate and Society”?**

As noted above, many universities have recently made substantial investments in climate change and related initiatives, among them Stanford, Arizona State, CalTech, and others. Moreover, there are considerable strengths at other universities in our region, most notably at the University of Colorado and at Colorado State. Most of these, however, have a strong science and technology orientation. Consequently, there remains an important opening for the social sciences, the humanities, and the professions to better understand both the societal

impacts of climate change and the ways in which those might be responded to by government, business, and civil society.

*Societal impacts*—The direct environmental impacts of climate change—rising heat, extreme weather events, drought, flooding, sea level rise, and others—are increasingly predictable. As the recent IPCC report makes clear, we now know with some certainty how CO<sub>2</sub> and other greenhouse gas emissions will impact the planet. What is less well understood are the second-order societal impacts. These include but are not limited to:

*Food insecurity*—Environmental change is making our food production systems increasingly vulnerable, with potentially dramatic increases in food insecurity in many parts of the world.

*Migration*—Climate migration has already begun and is highly likely to grow in coming years, with profound implications for the lives of immigrants and both the societies from which they come and those where they seek to go.

*Economic inequality*—Climate change threatens to increase economic inequality, largely because those with the fewest means will be least well positioned to adapt to the coming changes.

*Social unrest*—Increased food insecurity, migration, and economic inequality, coupled with the challenges posed by extreme weather, water shortages, are highly likely to spur greater social unrest, with uncertain impacts on the stability of societal institutions.

*International security*—Problems of scarce water resources, migration pressures, rare minerals needed for green technologies, and other tensions have already led to conflict and are likely to intensify.

*Democracy*—All of the above represent challenges to democratic governance, a test of whether we can construct both more inclusive and more effective governance capable of meeting the challenges of a hotter age.

*Justice*—Core moral, justice, and ethical issues lie at the heart of societal impacts. Those who are, already, most vulnerable and who are generally least responsible for climate change will face disproportionate negative effects of climate change. These groups often include members of minority or indigenous groups.

*Societal responses*—The societal impacts of climate change are not inevitable; they depend on the actions taken by governments, businesses, civil society, international organizations, and individuals in their capacities as both consumers and citizens, at local, state, national and international levels. Understanding what actions are likely to be most effective, at what levels and in what combinations are crucial, as well as what strategies are most likely to lead to such actions.

There are myriad points of possible intervention that scholars at DU are well-positioned to address. These include, but are certainly not limited to:

- international climate negotiations;
- sustainable international development strategies;
- national, state, and local climate policies addressing land use, water policy, agricultural policy, a transition to a zero-carbon energy system, and urban design;
- private governance in the form of ESG policies;
- climate science communication, climate activism and collective action, environmental conflict resolution;
- environmental disaster response;
- environmental rights and justice, including most pertinently for us in Colorado, indigenous rights; and
- public engagement and education.

### **Why DU?**

With so many other universities investing climate change, why should donors make an investment in DU? How can DU have an impact? What might make DU distinctive?

We see four reasons why DU is well-positioned to lead in this space:

First, DU's strengths in the social sciences, humanities and in the professional schools of law, business, social work, and public and international affairs align perfectly with the issues that have, to date, received less attention, yet are and will be the key issues over the coming years.

Second, this initiative ties squarely into core commitments of the university, most notably that to become carbon neutral by 2030, but also the 4-D student experience, the new mountain campus, and a focus on civic engagement.

Third, the strengths of the other major universities on the Front Range, notably CU Boulder, CU Denver, CSU, and the Colorado School of Mines are largely complementary to those of DU, positioning us to place a distinctive role, often in partnership with those institutions.

Fourth, the wider ecosystem in which we are based is perhaps the richest in the world in terms of resources on which we can draw, among them government agencies such as NREL, NCAR, and NOAA; research institutes and think tanks such as the Rocky Mountain Institute and the Keystone Policy Center; community organizations such as the Alliance Center; both traditional energy and green tech businesses; and public officials committed to addressing the societal impacts of climate change. And, the physical beauty of this area is a huge draw for all who care about these matters.

## Potential Impact

The DU Climate and Society Initiative will have impacts through our teaching, our research, and our direct engagement with stakeholders.

*Teaching impacts*—We need prepare the next generation to live and lead in a world reshaped by climate change. To meet this great challenge will require intellect and knowledge, character to take selfless action, commitment to further personal and planetary wellness, and wisdom to choose to play a meaningful part in the great collective enterprise meeting the climate crisis will require. To forge a sustainable future, students must be prepared to act rooted in knowledge and ethical training. They need to understand the linkages between human behavior and ecological systems, how to mitigate the most harmful effects of environmental change, and build just, climate-resilient societies.

As part of DU's commitment to the "4-D" student experience, every DU student should graduate with some level of climate literacy. The Climate and Society Initiative would contribute to this aspiration by complementing essential science education with a distinctive focus on the societal dimensions of climate change, and an emphasis on the myriad ways in which students can be engaged in being part of solutions throughout their careers. It would also focus on the thoughtful utilization of the mountain campus, going beyond 'Outward Bound'-style activities to create a synergistic relationship between the campus setting and course content.

*Research impacts*—Drawing on strengths in the social sciences and humanities, and in business, law, social work, international relations and public policy, DU is well-positioned to be a thought leader and model of engaged scholarship on issues of climate and society. The focus of this scholarship is articulated above. To maximize the impact of this research, the Climate and Society Initiative would work with CCESL, emphasizing engagement with stakeholders to drive the research process through community-based research (not just at the end in "translation"). Such engagement will not only help to generate research questions of relevance to practitioners, it will help ensure a more receptive audience for the research.

*Societal engagement*—The DU Climate and Society Initiative has the potential to have major impacts at local, state, national and international levels. In Colorado, there is a clear opening for engagement on such issues as indigenous approaches to the environment, management of the Colorado river basin, regenerative agriculture, and wildfire mitigation. Nationally, we have the opportunity to provide leadership on many aspects of environmental policy, not least through our excellent connections to our elected officials. Already, DU makes meaningful contributions to important international processes ranging from sustainable development, to the nexus of climate and democracy around the world, and to participation in the IPCC process. Engagement on all these issues would involve applied research, direct engagement with stakeholder communities, and not least preparing our students for leadership at all levels.

## DEI Emphasis

Diversity, Equity and Inclusion are central to this proposal, both at the heart of the societal impacts that are its focus, and, equally important, to the approaches needed to address those matters.

First, DEI concerns are central to both assessments of societal impacts and of possible responses. As noted briefly above, climate change is having and will have profoundly unequal and unjust impacts across geographies and populations. The world's most vulnerable communities will experience the greatest impacts and have the least capacity to cope with climate variability and extremes. In addition, efforts to transition the energy system to climate-friendly sources of energy will have a wide range of unequal effects on communities around the world. These disparate impacts raise critical questions about historical injustices and uneven social structures. Building on expertise in law, social work, anthropology, sociology, public policy, and education, research undertaken as part of the Initiative will examine systems of injustice and trace pathways for advancing economic, racial, and gender equity in the face of climate change.

Second, related, DEI issues need to be foregrounded as we consider and recommend processes through which public, private and civil society institutions respond to the climate crisis. The core questions include: Who has a seat at the table? How can we structure effective deliberative processes that give voice to those who have historically not had one, including notably indigenous and other historically minoritized communities?

Third, although the particulars of how the Initiative might be internally organized at DU still need to be worked out, we would be sure that DEI concerns would be represented. This could take different forms, but would certainly involve careful attention to diversity on whatever interdisciplinary steering/governance committee we establish.

### **Investment to Impact**

Although DU already hosts an extraordinary array of climate and society activities, to position the University as a leader will require a substantial investment to make the whole greater than the sum of its parts. The initiative described above could take different forms depending, in part, on its scale. Likely, it would take the form either of a center or an institute, but form should follow function.

The core of the proposal will require substantial philanthropic investment. Once established, the initiative would be able to attract substantial additional research support and would generate revenue from enhanced enrollments.

#### *Key philanthropic investments*

*Core staffing*—Virtually nothing else is possible without some core staffing. The number and type of staff will depend on the scale of the initiative, but likely between 1-5 FTEs.

*Faculty*—Faculty members are the heart of what we do. Although we have numerous strong faculty, the addition of 1-5 new faculty members would be highly desirable. One could be a named chair in Climate and Society. A nationally and internationally recognized star who could be a leader on campus and off. What specific aspects of climate and society for that chair and others are TBD, but all would have a clear climate and society orientation. These positions could be based in any of the participating schools and colleges.

*Research capacity*—To support the work of faculty and to catalyze research on priority topics, we envision a fund for seed grants, funds for workshops and other convenings that locate DU at the center of major conversations, and, importantly, support for 1-4 PhD students each year. We would also benefit from funding for some number of post-docs.

*Student Experiences*—This initiative would greatly expand DU's curricular and extra-curricular experiences for students. To support that expansion, we envision a fund to provide course development grants, course activity grants, funds to support internships and other practicums, and funding to allow for retreats and other activities at the Kennedy Mountain Campus.

*Student Recruiting*—To attract outstanding students from diverse backgrounds, particularly MA and professional students will require scholarship funding.

*Public engagement*—We envision a substantial public outreach dimension for this initiative, including public events in the form of speakers (and perhaps a named annual lecture), major convenings (a Denver Climate and Society Summit), and other forms of public engagement (working with CCESL and other units). The initiative will also need funding for regular communication about its activities and those its affiliates in the form of newsletters, social media, and the like.

### *Attracting Additional Support*

The Climate and Society Initiative will position us to better pursue sponsored research funding for complementary projects. For example, the National Institutes of Health recently announced exploratory grants for Climate Change and Health Research Center Development and the National Science Foundation has put out an RFP for Centers for Research and Innovation in Science, the Environment, and Society. Substantial funds will be made available over the coming years from other sources; a well-resourced initiative at DU will be an attractive investment for these and other organizations seeking to catalyze impactful work on climate change.

The Initiative would also provide the infrastructure for additional philanthropic investments on issues of particular concern to donors. These could be focused any of a vast array of topics

from empowering indigenous communities to the role of the arts in motivating climate action to the efficacy of corporate ESG efforts to climate science communication to supporting more sustainable development trajectories in developing countries, and much more.

### Impacts on Enrollment

DU is not now, but clearly should be, a highly salient destination for students concerned about climate change. A robust Climate and Society Initiative greatly enhances our ability to recruit students to DU, both undergrads and, importantly, graduate and professional school students. Our existing graduaage programs have degree or certificate programs whose curriculum could be expanded, while almost all our graduate programs have capacity to support higher student numbers. There is also considerable potential for developing interdisciplinary programs across schools and colleges. Currently, our lack of a clear reputation is a significant handicap in such recruiting.

\*\*\*

There is enormous philanthropic interest in climate change. Indeed, it hard to imagine a topic of greater interest. But donors are looking for distinctive opportunities with real potential for impact. We are confident that the initiative described in this white paper would position us well with that donor community. It addresses a public issue of highest concern. It is focused on salient aspects of climate change with the greatest potential impact. It complements, rather than competes, with investments elsewhere. It leverages existing assets. Finally, a major hub located in the heartland of America—especially on the Colorado Front Range—at a university dedicated to the public good is well positioned to have tremendous intuitive appeal.

## Grand Challenges in Health Equity

### Why this topic? And why now?

Health inequities diminish the lives of people in Colorado and around the world who are marginalized by ethnicity, gender, geography, income, and other social factors. For example, Coloradans marginalized by race and ethnicity report lower levels of physical and psychological health than peers as do people living with greater economic insecurity. Meanwhile, LGBTQ Coloradans report poorer psychological health as gender-based violence affects the psychological and physical health of girls, women, and gender nonbinary people. Differences in health are rooted in a host of persistent, structural problems that urgently require attention, such as barriers to accessing healthcare. Ultimately, health inequities manifest in terms of costly chronic diseases, infant mortality, and decreased life expectancy.<sup>1</sup>

Emerging from three years of global pandemic impacts, health inequities have increased with severe consequences for individuals and communities. As health scholars and other leaders nationally have described, the United States faces a crossroads where we must decide whether (and if so, how) to address the root causes as well as consequences of health inequities that were revealed and worsened by the pandemic.<sup>2</sup> Despite important national conversations about the best approaches to addressing health disparities and social determinants of health, comprehensive efforts to build meaningful systems to better community and overall health within the U.S. remain stagnant. Not surprisingly, the Denver and Metro Area's overall health mirrors the poor health outcomes visible nationally. Yet, eliminating health inequities is the best path forward to ensuring that individuals and communities can thrive, socially and economically, in Colorado and across the country.<sup>3</sup>

The Grand Challenges in Health Equity initiative brings together hundreds of DU faculty, staff, and students with community members to end health inequities through leading-edge research and education in health science. Together, we will:

- Uncover the factors that drive and sustain health inequities in Colorado
- Apply leading-edge research to the design and testing of solutions to end health inequities – from policy and technology to behavior health interventions
- Prepare a new generation of students and professionals in Integrative Health Sciences for an equitable future

---

<sup>1</sup> See, for example, Colorado health Access Survey, 2019; Colorado Health Equity Report, 2018; Colorado Department of Public Health and Environment, 2021.  
[https://www.coloradohealthinstitute.org/sites/default/files/file\\_attachments/2019%20CHAS%20Storybook.pdf](https://www.coloradohealthinstitute.org/sites/default/files/file_attachments/2019%20CHAS%20Storybook.pdf)  
<https://cclpvitalsigns.org/>  
[http://leg.colorado.gov/sites/default/files/images/5\\_cdphe\\_health\\_disparities\\_and\\_equity\\_0.pdf](http://leg.colorado.gov/sites/default/files/images/5_cdphe_health_disparities_and_equity_0.pdf)

<sup>2</sup> For example, in Colorado: <https://www.denverpost.com/2021/08/01/covid-health-equity-disparities-colorado/>; and nationally: Lee, I. J., & Ahmed, N. U. (2021). The Devastating Cost of Racial and Ethnic Health Inequity in the COVID-19 Pandemic. *Journal of the National Medical Association*, 113(1), 114–117.  
<https://doi.org/10.1016/j.jnma.2020.11.015>

<sup>3</sup> For example, LaVeist, T. A., Gaskin, D., & Richard, P. (2011). Estimating the economic burden of racial health inequalities in the United States. *International Journal of Health Services: Planning, Administration, Evaluation*, 41(2), 231–238. <https://doi.org/10.2190/HS.41.2.c>



## **What will be the outcomes and impacts of this initiative on society when funded?**

This project will advance health equity by connecting faculty, staff, and students from across the University with community- and system-based colleagues in facilitated, fast-paced collaborative teams designed to catalyze breakthroughs and innovation. The university-community teams will pursue shared agendas to create measurable change in health inequities while advancing discovery, teaching, and community impact. Together, teams will:

**Uncover the Factors that Drive and Sustain Health Inequities in Colorado.** For example, rapid research will lead to a new, transdisciplinary understanding of the complex roots of health inequities outcomes from the social determinants of health to healthcare access as well as technological and cultural barriers. A portfolio of basic and preclinical research will be available to guide the development of solutions.

**Design and Test Solutions to End Health Inequities.** Teams will test candidate interventions to end health inequities, from policy and technology to behavior health interventions. For example, projects might test scaling of screening and intervention for trauma across the lifespan; dissemination and implementation science through DU clinics; integration of the humanities into health systems.

**Prepare a New Generation of Students and Professionals in Integrative Health Science for an Equitable Future.** Building on the expertise of and experiential learning opportunities through the teams, DU will develop graduate and postgraduate micro-credentials in integrative health science that builds on DU's behavioral health and humanities expertise. This will result in the integration of interprofessional education at undergraduate, graduate, and postgraduate levels.

To realize societal outcomes and impacts, university-community action teams will be organized around specific issues that arise from and/or contribute to health inequities, such as houselessness, interpersonal violence, and early mortality. Charged with speeding the translation of basic research into solutions ready for testing and scaling, teams will be comprised of Fellows with expertise across a range of research methods—from basic science to applied research—and disciplines—from STEM and business to humanities, ethics, and law. In addition, teams will include diverse expertise in approaches to solutions—from policy and technology to systems and behavioral health.

Fellows will include DU faculty and staff and new postdoctoral and graduate student research assistant (GRA) positions. External Fellows will be invited from diverse settings, ranging from hospital/healthcare systems (e.g., Craig Hospital, CU Health, Denver Health, National Jewish) to community-based organizations, including healthcare advocacy and promotion organizations (e.g., Health Promoters from Project Protect Food System Workers). The Fellow experience will be a prestigious, world-class opportunity to pair work to advance public good discovery for health equity with professional development and growth, blending the best of national models for seeding collaboration and impact, from national synthesis centers to the Stanford Center for Advanced Study of Behavioral Sciences. The fellowship approach will allow teams to evolve work over time by inviting in new participants as the collaborative network builds and novel

partnerships are identified. Ideally, Fellows will spend two years working in-depth with teams, though the facilitated approach (described below) will flexibly support team members to rotate off/join as needed. Following the in-depth work with the team, Fellows will be invited to continue their affiliation and work with the initiative in leadership roles. Through leadership roles, the goal is to sustain work and support new cohorts of fellows while providing leadership opportunities and pipelines. Thus, the overall approach is designed to seed a growing network of faculty, staff, and community partners over time working towards health equity. In addition, undergraduate and graduate students will connect to teams via classes and research internships, offering a unique and distinctive learning experience.

The team approach will be built around one-year, iterative cycles. Each one-year cycle will begin with a facilitated process through which the team members identify a shared vision for a more equitable future in their issue area that is mutually beneficial in terms of community impact, discovery, and education. Over the first month, teams will identify existing research, including by DU scholars, on the factors that drive and sustain that inequity. This focus on root causes will result in early scholarly products (e.g., systematic review, white papers, or policy briefs) that will demonstrate effective collaboration among the group, which will be essential for external funding proposals, and provide a roadmap for designing strategic translational research and teaching activities. The team will identify seed projects aimed at multiple stages of the translation chain: basic research, preclinical research, clinical research, clinical implementation, and public health.<sup>4</sup> Seed projects will be key to building external funding. Projects will be implemented over the subsequent 10 months, with a focus on project scopes that support rapid timelines to advance innovation and discovery while generating pilot data and products that can be used to secure external funding and scale promising ideas into larger research projects. Over the final month of the cycle, the team's work will focus on identifying next steps to inform the subsequent one-year cycle; and strategies for sustainability, from efforts to secure external funding to public communication and policy work. The new one-year cycle will allow for iteration, building on achievements and lessons learned to realize the team's vision for measurable change.

A coordinating structure will be built on best practices in national grand challenge and synthesis center initiatives, such as the UCLA Grand Challenge for Depression, which has rapidly accelerated research along the translational continuum for public impact with significant external investments. Drawing on such national models, the Grand Challenges in Health Equity approach will support the launch and success of several teams per year. Each team will receive robust backbone support that includes (but is not limited to) facilitators trained in collective impact and results-based accountability approaches to collaborative change; staff support for coordination and logistical activities as well as external funding proposal development and management; and pilot project funding. These supports will ensure that teams can focus on building effective teams and quick iteration to seed high impact projects that will benefit the public good, advance discovery and teaching, and increase external funding. Further, staff support will be key to building connections beyond the initial team over time to grow the ecosystem of people connected to the team's work. This will include both internal (e.g., new faculty) and external (e.g., policymakers, practitioners, and journalists) audiences.

---

<sup>4</sup> See, for example, National Center for Advancing Translational Sciences: <https://ncats.nih.gov/translation/spectrum>.

Importantly, the teams will offer transformative learning opportunities for undergraduate and graduate students as well as health professionals on integrative health. Experiential learning through internships and community-engaged coursework will be key to innovative programs in Integrative Health Sciences supported through this approach. For example, DU will develop a postgraduate Integrative Health micro-credential for health professionals to build knowledge and skills to work more effectively across disciplines to address health, moving beyond simple disease detection and intervention. These micro-credentials will provide best practices across medical and behavioral health to increase health outcomes. In addition, we will take advantage of synergies with revisions to the undergraduate Wellness Minor and Living and Learning Communities to focus on integrative health and health equity. Experiential learning components will connect to the teams in addition to the potential for alignment with existing programs, such as Pre-health Education & Advising.

Highly successful teams will be in a position to spin-off into center or institute structures; however, increasing the number of centers and institutions is not, in and of itself, a primary goal of this approach. Rather, we seek to build the central coordinating structures that will allow DU to bring our trans-disciplinary expertise to bear over time on the shifting landscape of health inequities as well as to provide a roadmap for other team-based approaches to public problem-solving.

By achieving these outcomes, DU will achieve distinction nationally as a leader in advancing university-community collaboration across disciplines to lead to measurable improvement in communities. This demonstration is critical at a time when a skeptical public questions the proposition value of higher education and the impact of universities in the lives of their communities. The DU Grand Challenges in Health Equity initiative will be an exemplar of what is possible when higher education institutions advance discovery and teaching for public impact in health sciences, which will inspire connections to Denver communities in myriad forms – from policymakers and journalists turning to DU for expertise and problem solving to alumni engagement and philanthropic support.

An investment of \$50-\$100 million will ensure an effective coordinating structure to provide backbone support for the teams; funding for faculty and external Fellows to dedicate time to the fast-paced teams during the academic year and across summers; postdoctoral and graduate student training positions; undergraduate scholarships and student employment positions; project funds; professional development, including conferences; course development for connected classes; and related costs. In terms of related costs, teams may have space needs in other parts of the state for rural health equity initiatives or travel costs.

## **Why DU?**

Relative to other higher education institutions, including those affiliated with medical schools, DU has several distinct advantages for leading a grand challenge initiative to advance health equity. First, DU's outstanding faculty and staff include experts in health and health equity working at all stages of translational research – from cells to health systems, basic science to community applications, and prevention to treatment of disease. Further, the initiative's focus on

health equity builds on the existing strengths among DU's individual faculty and departments to connect scholars in new ways across disciplines and units, including College of Arts Humanities and Social Sciences, Graduate School of Professional Psychology, Graduate School of Social Work, Morgridge College of Education, Natural Sciences and Mathematics, Ritchie School of Engineering and Computer Science, Sturm College of Law, University College. The breadth of connection points across disciplines will drive innovation and discovery.

Second, DU has extensive expertise in behavioral health across departments and units, which creates opportunities for distinctive approaches to health equity work relative to initiatives nationally that focus primarily on detecting and treating diseases. For example, the behavioral health expertise will be essential to advancing strategies to promote change among individuals and systems to build a more equitable future, before disease management becomes the only option. Imagine what is possible, for example, when collaborative teams connect work by faculty and students investigating the roots of biases in perceptions of patients marginalized by poverty and racial/ethnic identity to that of colleagues with expertise in individual- and system- change to design and test innovative strategies. Further, imagine what is possible in terms of the uptake of strategies into existing systems when DU alumni bring what they learned from participating in these collaborative teams as students to the workforce in health-related positions in Colorado and around the country.

Third, DU is ready for transformative change because we have tested, refined, and identified effective strategies to promote inter- and trans-disciplinary collaboration for public good impact. For example, DU Grand Challenges is a university-wide initiative designed to advance community-university collaboration for public problem solving. DU Grand Challenges focuses on three issues essential to thriving communities, each of which connects to health equity: improving daily living, increasing economic opportunity, and advancing deliberation and action for the public good. In addition, DU has tested Knowledge Bridges, which provide a roadmap into the structures and resources necessary to seed collaboration and impact. Further, coordinating centers, including Center for Community Engagement to advance Scholarship and Learning (CCESL), Interdisciplinary Research Institute for the Study of (in)Equality (IRISE), Knoebel Institute for Healthy Aging (KIHA), already provide professional development and support for faculty, staff, and students, which will be essential to the campus ecosystem for scaling impact and transformation with this initiative. Finally, the project proposed by the Collaborative for Mental Health and Wellness to develop a community-based mental health clinic will have important synergies with this initiative, from shared space for community-based work to experiential learning opportunities for trainees across the two projects.

Prior pilot initiatives show that measurable progress on health equity in Colorado at scale is possible with new investments in teams designed to build shared agendas for action. Consider the impact that a group of faculty, staff, students, and community members had when they came together to address housing insecurity in a new way. Through the DU Grand Challenges Collective Impact Cohort program, this group – many of whom had never met or worked together before – identified shared goals to improve safety for people living in their cars. Housing insecurity and houselessness, of course, are tangled up with health inequities, increasing risk of victimization and health problems among those who are unhoused. Working with a newly formed Colorado Safe Parking Initiative (CSPI), the Cohort carried out activities

that resulted in measurable change. At the end of their participation in the Cohort program, 10 SafeLots were newly opened in four counties with more than a dozen additional lots in the pipeline. Community leaders up and down the Front Range began to champion the need for safe parking for individuals experiencing housing instability and living in their vehicles. Further, the effort resulted in funding to build a sustainable initiative, illustrated by a CSPI receiving \$150,000 in Emergency Services funding through the Colorado Department of Local Affairs. This scope of impact was possible with modest investment to recognize Cohort members' time, very limited staffing support for facilitation, and \$100,000 for project costs. Transformative change, then, is possible if an initiative built on this approach brings significant investment in faculty, staff, and community fellows' time, adequate pilot funding, and robust staffing focused on ensuring the team's success and sustainability.

Thus, we know that the facilitated collaboration approach built around shared aspirations, reciprocity, and results-based accountability will advance research and knowledge, student learning, and community impact. We also know that there is faculty interest in these approaches. For example, pilot DU Grand Challenges and Knowledge Bridges processes have yielded greater interest than capacity for the programs in terms of staffing and financial resources. We see this most recently in a call for the applications to a collaborative DUGC Fellows program offered through the Collaborative for Mental Health and Wellness, through which a graduate student, faculty, community team is pursuing a project that advances research on service access among Spanish-speaking families with children ages 0 to 5 while also seeking to improve access.

### **Increasing compositional diversity, inclusiveness, and justice at DU.**

With a focus on university-community collaboration to advance health equity, this project will increase compositional diversity, inclusiveness, and justice at DU. For example, higher education research indicates that historically marginalized faculty and staff are more likely than their peers to pursue community-engaged work and seek to apply their academic work to social change. Thus, this high-visibility initiative will support recruitment and retention goals by demonstrating that DU values engaged work and public good impact. Further, the initiative directly addresses barriers to community-engaged work and workload inequities that affect marginalized faculty by elevating and recognizing the importance of their work and providing concrete resources in terms of time and funding for projects and student involvement. In addition, as the impact and reputation of DU's approach builds, our external fellows slots will be a sought after opportunity for health equity leaders from across the region and national to spend sabbaticals working on the innovative university-community teams. Building on both traditional academic sabbaticals and innovations in community expert programs, such as through IRISE's Community Scholars Program, we will attract diverse thought leaders to DU.

The fellowship approach will allow us to build a world-class collaboration and training experience that will create a more inclusive and equitable pipeline to STEM, health, and connected careers. For example, the initiative will provide new pathways to health and STEM majors, graduate programs, and careers by linking scholarships to participation in the teams. This approach would build on thriving programs, such as Puksta Scholars and Colorado Women's College Leadership Scholars, where students join intentional communities where they connect their academic interests and social justice passions across their DU career. Additionally, graduate

and postgraduate training will prepare a new generation of scholar-teachers for trans-disciplinary research for public impact. The inclusion of external Fellows will broaden DU's reach and expertise and introduce new colleagues to DU, demonstrating our commitment to public good research for a more equitable future and creating opportunities to strengthen recruitment of new colleagues.

### **Advancing DU's commitment to the public good in a sustainable way.**

The Grand Challenges in Health Equity approach addresses an enormous public problem: health inequities, which diminish the lives and potential of individuals and communities. This approach scales work to realize measurable change by uncovering the factors that drive and sustain health inequities; designing and testing solutions to end health inequities and preparing a new generation of students to use integrative health approaches to build a more equitable future. Further, the approach emphasizes university-community partnerships for problem-solving that are mutually beneficial and reciprocal, which is a cornerstone of high-quality community engagement. This work, then, contributes to DU's overall approach to community-engaged, public good research, aligned with our Carnegie Elective Community Engagement Classification. Further, the proposal emphasizes building on existing strengths for public good impact in a way that is sustainable. For example, the team model is designed to advance networks of faculty, staff, and students working on collaborative health equity projects. The mix of DU and external collaborators as well as the iterative nature of the project design will encourage sustainable growth of the initiative, including pathways for faculty leadership.

**Project sustainability: Student interest, enrollments, and tuition revenue.** As reflected across a range of programs – from Pre-Health to DU Grand Challenges – there is great student interest in health careers as well as health inequities. Building on this foundation of student interest, DU is currently exploring plans to build our strategic allied health programs, such as Physical Therapy, Occupational Therapy, Speech Pathology/Audiology and Physician Assistant degree programs, with key partnership across Natural Sciences and Mathematics (NSM), Ritchie School of Engineering and Computer Science (RSECS), and Graduate School of Professional Psychology (GSPP). The development of such programs will provide synergies with the current proposal and contribute to expanding the population of students interested in this initiative. Beyond those long-term plans, the current initiative will connect to other curricular opportunities to deepen student interest, grow enrollments, and increase tuition revenue. Connections include revisions to the Wellness Minor and Living and Learning Communities mentioned above as well as new program opportunities for post-graduate micro-credentials in integrative health. These micro-credentials will build on DU's unique position in terms of deep behavioral health expertise with relevant trans-disciplinary connections, from engineering and law to humanities and bioethics. A series of post-graduate micro-credentials will provide unique, trans-disciplinary training to health professionals to use integrative health approaches as a strategy to advance health equity. This movement towards micro-credential aligns with market research indicating that employers near-universally share a positive view of micro-credentials for their employees.<sup>5</sup>

---

<sup>5</sup> <https://www.insidehighered.com/quicktakes/2023/02/23/employers-are-all-microcredentials-survey-shows>

**Project sustainability: External funding through grants, contracts, and philanthropy.** The seed projects supported through initial investments will demonstrate the effectiveness and public good impact of the university-community collaborative team approach while providing key pilot data to support competitive external grant proposals and contracts. For example, the Grand Challenges in Health Equity approach is well-aligned with transformative funding opportunities, such as the National Science Foundation’s Accelerating Research Translation (ART) Program. In addition, the National Institutes of Health (NIH) offer many special program announcements around social determinants of health/health inequity. Further, the National Institute on Minority Healthy and Health Disparities features several funding opportunities.<sup>6</sup> In addition, several state agencies and foundations would be interested in the initiative’s potential for affecting health equity in Denver and Colorado, such as the Boeing Foundation, Caring for Denver, Caring for Colorado, Centura Health Equity & Advancement Fund, Colorado Health Access Fund, The Denver Foundation, Rocky Mountain Health Foundation, and Sturm Family. Further, this initiative would be well-aligned with efforts to connect practicum placements for graduate students in clinical service to marginalized populations to external funding through government and private funding. Finally, we already have evidence of philanthropic interest in supporting student learning in collaborative, trans-disciplinary teams described here through DU Grand Challenges. For example, the Arthur Vining Davis Foundations has invested \$400,000 to date to scale learning opportunities for students through grand challenge work as well as invited a new proposal for \$350,000.

---

<sup>6</sup> For example, see <https://www.nimhd.nih.gov/> and [https://www.nimhd.nih.gov/funding/nimhd-funding/active\\_foa.html](https://www.nimhd.nih.gov/funding/nimhd-funding/active_foa.html).



Innovation to Address the Affordable Housing Crisis:  
The Institute for Housing Affordability and Strong Communities

I. Introduction

The U.S. suffers from a shortage of nearly 2 million homes, with acute needs experienced in 29 of our 50 states. According to John Burns Real Estate Consulting, homebuilders need to deliver 1.72 million homes per year for the next decade (17.2 million in total) to meet demand for housing – satisfying 12.7 million new household formations, 500,000 new second homes, 2.3 million teardowns, and our existing shortage. These needs are driven by decades of low supply and, more recently, increased household formation caused by work from home flexibility. The forward-looking supply need is significantly higher than the 1.44 million average annual units started between 1959 and 2022.

In Denver, and across Colorado and the West, these shortages have resulted in a housing crisis. Nearly 70% of residents of the Rocky Mountain West view affordable housing to be a major problem in their communities – a level of concern that far exceeds comparable community concerns about crime, drug addiction, or even the impact of the COVID-19 pandemic. As has been widely documented, the challenges of inadequate housing supply and excessive housing cost are acute – and worsening – in the state of Colorado, where more than 25% of renters are cost burdened, paying more than 30% of their incomes towards housing. Those already facing housing insecurity during this crisis find themselves pushed out of the bottom of the housing market and into homelessness. Even for those managing to pay rent, home ownership – long viewed as fundamental to “the American dream” and closely linked to wealth creation, economic mobility, and community resiliency – is increasingly out of reach.

The roots of this crisis are multi-faceted. The outlays for land, materials, labor, and other construction costs have significantly increased in the last decade, affecting our ability to maintain affordability. Transformative technologies and other innovations in the construction trades, which have the potential to increase efficiencies and lower costs, have lagged other industries. In addition, wages in the region have not kept pace with inflation, reducing the purchasing power of many Westerners. Finally, since 2010, residential construction in Colorado and the West has failed to keep up with population or employment growth, resulting in historically low housing inventories and historically high housing prices. This imbalance between supply and demand has limited the ability of even moderate-income Coloradans to afford housing, to say nothing of those earning less than the median income. It is now well-established that policies affecting new housing development are a major contributor to the housing shortage.

The lack of supply and high cost of housing has ramifications across the region, affecting economic growth in Colorado, distorting labor and job markets, and impacting environmental and natural resource quality. Limited housing supply prevents Coloradans from living in



communities with greater economic opportunity, constraining growth in industries that cannot find employees and restricting access to jobs for those who cannot afford the cost of living. For those willing or able to commute long distances to work, the lost productivity and environmental impacts resulting from the spatial mismatch between jobs and housing are significant.

In addressing the availability and cost of housing, additional considerations, such as the type and location of housing, significantly influence the sustainability and strength of our region. Where and how we produce needed housing is as important as the price of that housing in overall cost of living and quality of life in the region. Strong, thriving communities require housing that is located near transit and other mobility infrastructure to enable access to educational and employment opportunities; that is water and energy efficient to reduce living expenses and promote sustainability; and that is affordable to people across the full spectrum of need to ensure equitable, inclusive, and complete communities. The development of transit-oriented communities around transit stations and mobility hubs is important to leverage transportation and infrastructure investments in order to increase ridership, reduce pollution, and, ultimately, support a functional economy.

Recognizing the importance of solving these problems to the future of the West (and, indeed, the country), state and local governments have recently prioritized investing in social service programs, supportive and affordable housing, and land use policies designed to spur development and produce housing. Many efforts are being funded in the short term with federal stimulus dollars, and these housing and land use law and policy initiatives are largely experimental and untested, often supported by anecdotal evidence of their efficacy in addressing housing concerns. At the same time, the change associated with rapid development is unsettling to long-time residents, who do not see evidence that increased density and significant real estate development solves the affordability challenges. Rather, growth is associated with increased housing costs, homelessness, congestion, and pollution. As a result, the politics of development is fraught with suspicion and distrust, undermining the potential success of solutions that might make a difference.

As communities across the West grapple with these challenges and, in desperation, try new approaches, there is a need for guidance about ways to effectively create housing solutions that foster sustainable, inclusive growth. There will be more innovation in U.S. housing in the next 5 years than in the last century. Harnessing that innovation requires new thinking, transparent collaboration, and strong leadership.

An interdisciplinary Institute for Housing Affordability and Strong Communities at the University of Denver – with its expertise in real estate, construction management, law, business and finance, land use, housing and homelessness, public policy, and social justice – could provide much-needed regional leadership as a trusted, independent center for the development, evaluation, and implementation of research-based solutions across key disciplines.

## II. The Proposal for an Institute for Housing Affordability and Strong Communities

*An Institute for Housing Affordability and Strong Communities* at DU will be designed to (1) research, develop, evaluate, and disseminate effective solutions to address the housing crisis; (2) foster strong, healthy and inclusive democratic communities; (3) advance sustainable development and construction solutions; (4) realize human potential and entrepreneurship; and (5) build civic capital.

The Institute will be the interdisciplinary hub where scholars, professionals and policy-makers with expertise from multiple fields will come together with students and community partners to address the many facets of the housing issue in Colorado and beyond. Ultimately, this Institute will be a community-engaged academic center that:

- produces case studies of localities, regions, and states that have implemented innovative land use reforms, housing programs, and other solutions, providing in-depth analysis of what has (and has not) worked;
- engages in cutting-edge and interdisciplinary scholarship at the intersection of sustainable land use and real estate development; inclusive and engaged communities; equity and social justice; and housing policy and practice;
- promotes sustainable urban development housing innovation research and implementation for housing solutions and advanced homebuilding methodologies;
- develops and disseminates research-backed policy and program recommendations;
- curates and facilitates conversations with developers, housing advocates, urban planners, and local government officials to explore the implications (and potential unintended consequences) of reform;
- educates students, professionals, and the broader community about the complex problems we face in creating sustainable, inclusive communities, as well as proven solutions and best practices to address these problems;
- partners with developers, community groups, civic leaders, and others to develop, test, implement, evaluate, and adapt solutions on the ground, taking advantage of our fast-growing region to experiment with new ideas and approaches.

Because developing the capacity of the Institute will take time, we propose a phased approach to implementation that will allow us to leverage our existing strengths to make an immediate difference in the initial phase and then to learn and adapt over time, as we develop additional capacities.

#### A. Pilot Phase: Building Capacity

As a first step towards developing the Institute, the University of Denver proposes a two-year pilot project focused on program analysis and evaluation, starting with key policies and programs launched in Colorado over the last few years to address homelessness, housing insecurity, and housing affordability. This initial phase of work will bring together an interdisciplinary research team from across campus, together with community partners, outside stakeholders, and engaged professionals, to select the policies and programs to be studied; to identify the most pressing questions arising from these chosen policies and programs; to develop a research and evaluation plan; and to engage faculty, students, and outside experts on research teams that will analyze successes and shortcomings, distill lessons learned, and offer recommendations.

The goal of this pilot project is to build the Institute's infrastructure while assessing the efficacy of the most important policy responses to housing insecurity and homelessness, which will help both policy makers and developers refine their approaches to housing affordability. In addition to collecting and analyzing quantitative data regarding the impact of these solutions, the project will draw on existing partnerships and relationships across a variety of sectors, including real estate developers and land use professionals, housing and related service providers, those with lived experience of housing insecurity and homelessness, civic leaders, and policy makers, to ensure that our analysis and evaluation includes qualitative assessments of the successes and shortcomings of the programs and policies. As part of its core mission, the Institute will engage students in research, will communicate its findings to the public, and will provide education and training designed to promote the adoption of effective solutions.

#### B. Institute's Mission at Buildout

As the Institute matures, we anticipate broadening its scope, reach, and influence in a variety of ways.

##### 1. Research

The Institute will provide program evaluation, policy research, and a place-based approach to innovation on a wide range of housing-related topics, across both the urban and rural geographies of the Rocky Mountain West. Our mission is to be THE independent, credible source in the region for research-based information on best practices, policy interventions, and programs to address homelessness, housing insecurity, affordability, and sustainability.

As the Institute earns a reputation as a trusted source for expertise on issues related to housing, important policy and program questions and challenges arising within the region will set the agenda for the Institute's work. Committed to engaged and applied research, the Institute will curate and foster community partnerships and outside advisors to ensure that the research embraces diverse perspectives, honors lived experience, and is well grounded in the particulars of place.

Building on DU's location in Denver and its commitment and strength in international studies, the Institute will ground its work in local problems and solutions, using comparative approaches both to bring global perspectives to our place-based work and to enable lessons learned to be shared to other regions of the nation and world. The ultimate goal of the Institute will be to use Denver and the Rocky Mountain region as a lab for experimentation, study, and evaluation in addressing the housing crisis, informed by learnings from around the world, and to develop expertise here that will position DU as a global leader on these issues.

Creating the capacity to deliver on this promise will require investment in a Director of Research to design and oversee the research agenda, Research Fellows (graduate students, post-doctoral fellows, or other researchers) to carry out identified research projects, and DU students who can contribute to the research as part of their academic program. We will also need to cultivate a far-sighted and innovative Advisory Board, representing subject matter experts and affected stakeholders, to shape, develop, and execute a strategic, community-engaged research agenda.

## 2. Curriculum

This Institute will contribute to DU's curriculum by exposing students to the complexity of the housing ecosystem and expanding opportunities for students to gain expertise and learn skills as preparation to enter housing-related careers. Housing encompasses questions of social justice and structural inequalities, land use law and policy, the role of market forces, opportunities for innovation and technology, and sustainable development. The public, private, and non-profit sectors are deeply intertwined in the planning, development and provision of housing, and students would benefit tremendously from a 360-degree approach to the issue in the classroom and through hands-on experience with professionals in the field.

As interdisciplinary teams tackle research questions together, we anticipate that the development of innovations in the curriculum will follow. Possibilities include:

- expanded unit-level course selections that expand the scope of our academic offerings;
- development of interdisciplinary coursework and capstone opportunities connected to the Institute's mission;
- cultivation of a diverse set of internship and externship opportunities that enhance students' ability to engage directly in addressing these challenges; and
- the creation of new certificate or degree programs designed to build on the growing expertise of the Institute and develop leadership and capacity in the region.

The Institute will play a pivotal role in the development of students' professional skills and their employment prospects: a close contact to public and private sector professionals will refine students' competence and provide them with immediate networking opportunities that would greatly enhance their employment chances.

Expanding the curriculum will require additional faculty, which will likewise enhance expertise, capacity, and reach.

### 3. Convening and Communication

The Institute will provide the ideal forum for community engagement in all housing-related issues at the University of Denver. DU has long played a pivotal role in convening thought leaders, community partners, and subject-matter experts, along with faculty, staff and students, to address pressing issues of the day. Building on this capacity, the Institute will host regular seminars, workshops, and conferences to bring local, national, and global experts together in the sharing of best practices and production of knowledge. These convenings will arise from, and inform, the Institute's research agenda, and provide a platform for disseminating knowledge, enabling the Institute to expand its reach.

To maximize impact, the Institute will host a communications hub, providing a platform for dialogue (including a blog), access to research, and regular communications about activities and events. The communications hub will serve as a means to engage scholars, experts, and stakeholders, as well as the general public, about issues relating to housing access and affordability.

To support these convening and communication functions, the Institute will develop a website/information hub and communications capacity. This capacity will also support on-going fundraising and development efforts.

### 4. Continuing Education and Training

To scale its influence, the Institute will support the development of housing expertise and capacity by providing continuing education and training to real estate and land use professionals, civic leaders, and the housing community. Housing issues are complex and rapidly evolving, and there is a significant need for on-going education and training regarding evolving technologies, policies, and best practices. The Institute will build on DU's strengths as a provider of professional continuing education in the legal, real estate, and planning fields and become a trusted provider for those working in the housing ecosystem.

## III. The Case for DU

### A. DU is Uniquely Positioned to Lead this Work

Capitalizing on our world-class expertise in land use law and policy, real estate and construction management, local government law, education, social work, and public policy, as well as on our distinctive geographic location in one of the nation's most rapidly growing urban centers, the University of Denver is positioned to make a significant and singular contribution to addressing the affordable housing crisis confronting the state of Colorado, the U.S. West, and the nation. DU should lead on these issues for a variety of reasons:

- Colorado's status as an increasingly unaffordable, and fast-growing, state with innovative leaders and an entrepreneurial real estate industry makes it an ideal location for experimentation and study;

- There is a dearth of independent, academic research focused on the housing crisis and a lack of capacity in Colorado (and elsewhere in the West) to study and evaluate the adopted policies and innovations;
- DU is in the epicenter of the Rocky Mountain Housing Region. The region is a diverse market with a strong presence from most national and regional homebuilders. It represents all of the climate zones, market demographics, and industry challenges across the nation;
- The University's institutional strengths in law, policy, social justice, and real estate are perfectly aligned to address the unique challenges associated with housing access, equity, and affordability;
- DU is a trusted source for land use and housing information already and has been asked to provide analysis and to help inform policy approaches, but has lacked the capacity to engage as effectively as desired; and
- DU's commitment to community-engaged research and place-based teaching and learning and, as a result, its deep relationships and partnerships in the community, provide a strong, and essential, foundation for building an Institute capable of contributing meaningfully to an equitable, inclusive region.

The complex housing ecosystem includes only a handful of nationally recognized university-based institutes that focus on research related to housing affordability across a spectrum of need – and none of them are located in the Rocky Mountain West or are focused on the unique circumstances at play in this region.<sup>1</sup> The only other university in the Rocky Mountain West that contributes significantly to research or academic leadership on questions of homelessness, housing, and affordability is the University of Utah. Utah's David Eccles School of Business houses the Kem C. Gardner Policy Institute, which provides leading real estate and construction research for the State of Utah, including information about residential and non-residential construction trends and issues as well as housing research related to affordability and market stability. The focus of this Institute, however, is strictly on the Utah real estate market, and does not include (historically, at least) research on land use and zoning policies, social justice issues, comparative policy approaches, or real estate innovations. The Gardner Institute does serve as a central source of information on real estate and housing market trends and is developing a statewide database to track local compliance with Utah's moderate housing policies. The important role that the University of Utah plays in providing trusted data for the

---

<sup>1</sup> See Appendix A for a summary of housing centers around the country. Within Colorado, the only academic research program that “competes” for space in the housing ecosystem is the University of Colorado; however, their engagement is relatively limited; does not integrate its planning, law, and real estate programs; and, so far, has not played a significant role in the homelessness and housing affordability discussions among state policy makers.

state policy makers is instructive, suggesting that here in Colorado a similar role, at a minimum, would be valuable.

B. DU has Established Itself as a Leader on these Issues

Working with industry leaders, academic partners, community-based organizations, foundations, and elected officials, DU has a strong track record of thought leadership and education on issues related to homelessness and housing – evidence that DU is capable (with additional investments) of building the preeminent Housing Institute in the region.

To name just a few examples:

- An interdisciplinary team, working with community partners and outside experts, conducted research on land use reforms to increase housing supply and improve affordability, developing a white paper that is influencing legislative zoning at that state legislature;
- An interdisciplinary cohort partnered with community-based groups to address housing and food security through DU's Grand Challenges Initiative, which resulted in the creation of the *Colorado Safe Parking Initiative* (a new non-profit);
- We have secured funding for the Homebuilding Talent Training and Development Ecosystem through the National Housing Endowment;
- We have secured external funding to assess the impact of 1) the Denver Basic Income Project providing unconditional cash to people experiencing homelessness, and 2) trauma informed design in permanent supportive housing;
- We convene an annual conference on land use that brings in a national audience and provides a platform for sharing knowledge to address the confluence of land use and housing affordability. Rocky Mountain Land Use Institute - <https://www.law.du.edu/rmlui>;
- We are hosting the [Housing Innovation Summit 2023](#) in partnership with the [Housing Innovation Alliance](#).

We are growing our engagement with faculty across campus for DU's Institute for Housing Affordability and Strong Communities. Although our conversations are on-going, a number of Faculty have already endorsed the Institute, recognizing the important role that we, collectively, could play in addressing the housing crisis.<sup>2</sup>

C. This Institute Advances DU's Mission to Serve the Public Good

The Housing Institute, in tackling the most pressing public policy issue of our time, reflects DU's commitment to the public good. At the same time, addressing housing access and affordability could be one of the most meaningful possible interventions to address historic racism.

---

<sup>2</sup> See Appendix B for a current list of faculty who have endorsed the Institute for Housing Affordability and Strong Communities.

Housing security and home ownership are at the core of achieving the American Dream; indeed, stable housing is a prerequisite to educational access, job opportunities, and economic stability. In America, home ownership is the primary means to build wealth and achieve financial security. However, many people face substantial obstacles to achieving these goals. Although explicitly racist laws no longer prevent access to housing, the legacy of those laws is still evident in exclusionary zoning codes and systemic barriers to housing, which lead directly to segregated neighborhoods and schools and, as a result, generational inequality. As many researchers have confirmed, the zip code of one's birth is the single most important determinant of social mobility and economic outcome, influencing household income, educational attainment, employment and incarceration rates, and health.

Because housing is fundamental to social equity, an Institute dedicated to addressing the housing crisis is an important investment that DU could make in its efforts to advance diversity, equity, and inclusion. One of the DU's strengths in standing up a Housing Institute is GSSW's expertise on issues of structural inequality and social justice, which will set DU apart from its peer institutions in addressing housing affordability. Likewise, the Institute embodies DU's long-term commitment to the public good by creating an enduring culture of engagement with the full housing eco-system and of continuing exchange of ideas across the public, private and non-profit sectors. The scholars and practitioners we train will be the future leaders in the housing sector in Colorado: by shaping their values and practices, the Institute will contribute to the long-term impact of DU's commitment to the public good.

#### IV. The Building Blocks for a Housing Institute

Our previous efforts demonstrate our potential, but also our limits. To deepen and expand our work (not to mention scale our solutions), we need operational and administrative support to coordinate interdisciplinary projects, to convene community partners, and to support student engagement and collaborative research. Ideally, we would also bolster our academic expertise with the addition of a housing policy expert. Although we collectively have expertise in land use law, public policy, social justice, and real estate, our team lacks specific expertise in housing economics and housing policy. Additional resources would allow for strategic investments to elevate our research and reach to a regional and national scale.

Specifically, standing up an effective Housing Institute will require the following investments:

- Faculty Director: a senior faculty member to develop and implement the strategic vision for the program, engage faculty members and other stakeholders in curriculum and program development; and serve as a spokesperson for the Institute;
- Research Director: To complement and augment our already significant group of experts in land use, construction management, local government, social justice, and public policy, we would hire a nationally recognized expert in housing to design and facilitate an interdisciplinary research agenda and support the development of the Institute;



- Research Fellows: The Institute will employ post-doctoral fellows and/or outside experts to supplement DU's in-house expertise, in order to be responsive to and execute community-based research priorities.
- Student Researchers: The Institute will provide stipends to support undergraduate and graduate student research assistants
- Affiliated Faculty: The Institute will provide faculty stipends to support faculty research and curriculum development in support of the Institute
- Project Coordinator: Working in close collaboration with Research and Faculty Directors, the Project Coordinator will take a leadership role on engaging relevant governmental, industry, and foundation stakeholders; on developing outreach and engagement programs (e.g., convenings, symposia, workshops, and training); coordinate and manage student engagement, including internship and externship opportunities
- Communications/Development Coordinator: To maximize our reach and impact, the Institute will require development of a website that can serve as a hub for research and for information about the Institute's activities. A communications/development expert will manage internal and external communications, maintain the website (and perhaps related blog), and support fundraising and outreach efforts.
- Workshops, Symposia, and Convenings: Timely workshops and symposia will inform policy leaders and disseminate recommendations to a wide range of stakeholders in the future of housing.

## V. Funding

### Federal External Sources:

The National Science Foundation (NSF) funds Synthesis Centers and Innovation Engines. The Burns School has an NSF 'Housing Innovation Engine' Proposal already submitted for review. The Department of Energy (DOE) funds Urban Integrated Field Laboratories and Net Zero Housing Research. The United States Department of Agriculture (USDA) funds the Rural Development program.

### Foundations:

We've identified the Gates Family Foundation, The National Housing Endowment (NHE), Build Strong Foundation, and The Building Talent Foundation as possible funding sources. We are currently in conversation with the NHE and Build Strong Foundation. The NHE already supports the Burns School with a Homebuilding Education Leadership Program (HELP) Grant for Home Building Workforce Development.

## VI. Conclusion

Faculty at DU have already made significant contributions in addressing homelessness and housing affordability, but recognize the potential to greatly expand DU's reach and impact with the establishment of an Institute on Housing Affordability and Strong Communities.

## Appendix A

### Housing Centers Summary - 4-5-23

A number of effective research and policy centers focused on housing exist in other parts of the country.

#### Focused on Policy

- NYU Furman Center - <https://furmancenter.org/>
  - Advancing research and debate on housing, neighborhoods, and urban policy.
  - Established in 1995, it is a joint center of the New York University School of Law and the Robert F. Wagner Graduate School of Public Service.
  - Critical land use and housing issues for NY State
- Virginia Center for Housing Research - <https://www.vchr.vt.edu/>
  - The Virginia Center for Housing Research (VCHR) is the official housing research and information center for the Commonwealth of Virginia and is an interdisciplinary college research center in Virginia Tech's College of Architecture and Urban Studies.
- Institute for Housing Studies at Depaul University - <https://www.housingstudies.org/>
  - The Institute for Housing Studies (IHS) is a research center situated in the Real Estate Center at DePaul University. IHS's mission is to provide reliable, impartial, and timely data and research to inform housing policy decisions and discussions about the state of housing in the Chicago region and nationally. IHS's work in particular focuses on affordable housing issues and understanding the changing dynamics of neighborhood housing markets.
- Turner Center for Housing Innovation-UC Berkeley - <https://turnercenter.berkeley.edu/>
  - Established in 2015, the mission of the Turner Center for Housing Innovation at the University of California at Berkeley is to formulate bold strategies to house families from all walks of life in vibrant, sustainable, and affordable homes and communities.
- Urban Institute - <https://www.urban.org/>
  - The Urban Institute is a nonprofit research organization that provides data and evidence to help advance upward mobility and equity. We are a trusted source for changemakers who seek to strengthen decisionmaking, create inclusive economic growth, and improve the well-being of families and communities. For more than 50 years, Urban has delivered facts that inspire solutions—and this remains our charge today.

- Joint Center for Housing Studies of Harvard University - <https://www.jchs.harvard.edu/>
  - Established in 1959, the Harvard Joint Center for Housing Studies advances understanding of housing issues and informs policy. Through its research, education, and public outreach programs, the Center helps leaders in government, business, and the civic sectors make decisions that effectively address the needs of cities and communities. Through graduate and executive courses, as well as fellowships and internship opportunities, the Center also trains and inspires the next generation of housing leaders.
- Rutgers Center of Urban Policy Research - <https://devblousteinlocal.rutgers.edu/>
  - Established in 1959, the Center for Urban Policy Research (CUPR) works to make human settlements more equitable, sustainable, resilient, and healthy through research, public engagement, education and other forms of capacity-building.
- DukakisCenter for Urban and Regional Policy, Northeastern University - <https://cssh.northeastern.edu/dukakiscenter/>
  - Founded in 1999, the Kitty and Michael Dukakis Center for Urban and Regional Policy conducts interdisciplinary research, in collaboration with civic leaders and scholars both within and beyond Northeastern University, to identify and implement real solutions to the critical challenges facing urban areas throughout Greater Boston, the Commonwealth, and the nation.
- Housing Colorado - <https://www.housingcolorado.org/>
  - Launched in 2005, Housing Colorado is a statewide membership organization committed to providing advocacy, professional development and issue expertise for the affordable housing community.
- Kem C. Gardner Policy Institute, University of Utah - <https://gardner.utah.edu/>
  - The Kem C. Gardner Policy Institute, part of the David Eccles School of Business at the University of Utah, prepares economic, demographic, and public policy research that helps Utah prosper.

### **Focused on Material Science-Building Codes**

- Pennsylvania Housing Research Center - <https://www.phrc.psu.edu/index.aspx>
  - Established in 1979, the Pennsylvania Housing Research Center (PHRC) provides and facilitates education, training, innovation, research, and dissemination to the residential construction industry for the purpose of improving the quality and affordability of housing. Educational programs and publications by the PHRC address a wide range of topics relevant to the home building industry and are designed to reach a diverse audience: builders, code officials, remodelers, architects, developers, engineers, planners, landscape architects, local government officials, educators, etc. to provide professional development and

continuing education. The PHRC is administered through the Department of Civil & Environmental Engineering at Penn State University.

- Home Innovation Research Labs - <https://www.homeinnovation.com/>
  - Home Innovation Research Labs (formerly the NAHB Research Center) was founded in 1964 as a wholly-owned, independent subsidiary of the National Association of Home Builders (NAHB). Originating as a small product testing laboratory, we have since grown to become a full-service market research, consulting, product testing, and accredited third-party certification agency dedicated solely to issues related to the home building industry.
- Cold Climate Housing Research Center - <http://cchrc.org/>
  - Promoting and advancing the development of healthy, durable, and sustainable shelter for Alaskans and other circumpolar people.
- Virginia Center for Housing Research - <https://www.vchr.vt.edu/>
  - The Virginia Center for Housing Research (VCHR) is the official housing research and information center for the Commonwealth of Virginia and is an interdisciplinary college research center in Virginia Tech's College of Architecture and Urban Studies.

### **Focused on Land**

- Urban Land Institute - <https://uli.org/>
  - ULI is the oldest and largest network of cross-disciplinary real estate and land use experts in the world. ULI is its members. Through our members' dedication to the mission and their shared expertise, the Institute has been able to set standards of excellence in development practice.
- Rocky Mountain Land Use Institute - <https://www.law.du.edu/rmlui>
  - The Rocky Mountain Land Use Institute seeks to elevate the law, policy and practice of sustainable development in the West to promote nature-friendly, prosperous and equitable communities. Through innovative research, education and professional development programs and its renowned annual conference, the Institute trains and connects students and professionals across disciplines, sectors and regions to build the sustainable development field while creating new possibilities for the future of the West's landscapes and livelihoods.

## Appendix B

DU Faculty who have expressed support for an Institute for Housing Affordability and Strong Communities:

- Naazneen Barma, Director of the Scrivner Institute of Public Policy, Faculty, Josef Korbel School of International Studies
- Eric Boschmann, Faculty, Department of Geography and the Environment
- Daniel Brisson, Director, Center for Housing and Homelessness Research, Faculty, Graduate School of Social Work
- Paula Cole, Faculty, Economics Department
- Patience Crowder, Director, Community Economic Development Clinic, Faculty, Sturm College of Law
- Susan Daggett, Director, Rocky Mountain Land Use Institute (Law)
- Leslie Hasche, Faculty, Knoebel Institute for Healthy Aging, Graduate School of Social Work
- Eric Holt, Faculty, Burns School of Real Estate and Construction Management
- Juan Carlos Lopez, Faculty, Department of Economics
- Drew Mueller, Faculty, Burns School of Real Estate and Construction Management
- Linda Olson, Director, Leadership Studies Program (Living and Learning Communities)
- Rebecca Powell, Faculty, Department of Geography and the Environment
- Vivek Sah, Director, Burns School of Real Estate and Construction Management
- Lapo Salucci, Faculty, Josef Korbel School of International Studies
- Sarah Schindler, Director, Environmental and Natural Resources Law Program, Faculty, Sturm College of Law
- Daniel Trujillo, Faculty, Burns School of Real Estate and Construction Management

# The University of Denver Interdisciplinary Institute for Democracy

## Ideas to Impact White Paper

April 10, 2023

**Contributors:** Naazneen Barma, Sara Chatfield, Susan Daggett, Anne DePrince, Cara DiEnno, Darrin Hicks, Seth Masket, Fritz Mayer, Rebecca Montgomery, Linda Olson, Sarah Pessin, Lynn Schofield Clark, Susan Schulten, Rachel Sigman, Elizabeth Sperber, Joshua Wilson.

### I. Introduction and Overview

Democracy has come under a range of pressures and threats around the world. Globally, an anti-democratic populist wave continues to surge, while the institutional deficits to address our most troubling collective challenges — most centrally climate change — have been laid bare. In the United States, political radicalization and social polarization have undermined trust in democratic institutions and made society ever more vulnerable to widespread mis- and disinformation. Civil discourse and civic mindedness have suffered at even the most local levels under these pressures, as witnessed during the Covid-19 pandemic. The challenge before us is to reimagine and rebuild democracy, from the global to the local levels, for the 21<sup>st</sup> century.

The **University of Denver’s Interdisciplinary Institute for Democracy** takes on the challenge of democratic renewal. It does so through a concerted commitment to improving our collective ability to understand and address the challenges to democracy both at home and abroad. Recognizing that democracy requires a range of supportive attitudes, practices, and institutions to successfully serve the diverse communities it governs, the Institute will support innovative interdisciplinary research, education, and public engagement centered around two major interrelated themes:

1. **Civic identity and citizenship:** focused on cultivating the next generation of civically-engaged, public service-oriented leaders through the advancement of civil discourse, leadership, and political efficacy (i.e. organizing, activism, and communication).
2. **Democratic institutional renewal:** focused on understanding and effective models of democratic governance capable of addressing complex public policy challenges from local to global levels.

The University-wide Institute is well-positioned to marshal existing centers and substantive expertise across the faculty as a foundation for creating a truly interdisciplinary, cross-campus, and equitable initiative that will serve a broad range of University aims. The Institute will knit together the range of democracy-related work at the University of Denver to develop complementary linkages between them and amplify their collective impact and reach. Centered on the two core themes of civic identity and citizenship and democratic institutional renewal, the Institute will manifest a “local-to-global” perspective across its programs. It thus stands to offer substantive research and public engagement of critical importance both within the United States and abroad. Embedded in this approach is a cross-cutting emphasis on how Colorado can learn from other contexts and how, in its evolving political make-up — and as a destination for people seeking improved economic opportunities and well-being — Colorado can serve as a laboratory for effective citizenship and governance approaches for other communities across the world.

The Institute will advance these aims through a range of educational, research, and public engagement activities. Its educational programming will provide new curricular and research opportunities to

students and faculty alike, including, for example, a new interdisciplinary Democracy Studies certificate program for undergraduate students. It will also establish DU as host of a “Democracy Quarter” program that brings together students from across the world for an intensive and immersive democracy-focused educational and networking program. The Institute will establish DU’s reputation as a leading producer of knowledge by supporting a multi-pronged fellowship program that incentivizes DU and external faculty, as well as graduate and undergraduate students, to engage in democracy-focused research, teaching, and public events. The Institute will also serve as a focal point for connecting and amplifying the significant range of democracy-related public engagement already underway across DU, enhancing the University’s ability to deliver on the public good and burnishing its reputation for doing so.

The next two sections of this white paper further discuss the two core themes of civic identity and citizenship and democratic institutional renewal respectively, identifying existing DU activities related to each theme and describing how the Institute would build on and amplify the impact of these activities. Section 4 outlines new programs and activities that will be supported by the Institute. Section 5 discusses the Institute’s contributions to core DU values and priorities including enhancing the 4D experience, advancing DEI principles, and contributing to the public good. Section 6 outlines potential structures for the Institute along with a set of guiding principles for coordination across academic units and Institute governance. The final section discusses the Institute’s ability to attract resources and to sustain itself over time.

## **II. Core Theme #1: Civic Identity and Citizenship**

Democracy requires informed, active, and civic-minded participants to generate sustainable, community-oriented solutions to a range of complex governance challenges. The Institute’s focus on civic identity and citizenship aims to cultivate DU students’ capacities to co-create solutions to collective problems through the development of skills and practices that advance civic dialogue, ingenuity, and action. Specifically, the Institute will build on DU’s existing programs that deepen understanding and empathy toward fellow citizens, promote civil discourse, facilitate community engagement, promote informational and media literacy, and cultivate civic leadership and political efficacy. DU has already made a commitment via the 4D experience to cultivating in students the values of citizenship and civic duty as they pursue public-minded lives and careers of purpose. Faculty from across the university offer courses and engage in research that advance these objectives.<sup>1</sup> The University has also supported a range of impactful activities in these areas including (but not limited to) the Center for Community Engagement to Advance Scholarship and Learning, the Leadership Studies Program, the Inclusive Global Leadership Initiative, and various civil discourse programs that aim to foster inclusion and participation while also making room for a wide range of ideas, experiences, and perspectives.

Within the theme of civic identity and citizenship, the Institute will build on existing strengths by supporting programs that link together these activities in three main areas: leadership for the public good, political efficacy, and civil discourse.

**Leadership for the Public Good:** A civically engaged education plays a crucial role in inspiring and preparing the next generation of leaders who can safeguard and enhance our democracy. The Institute will solidify DU’s position as a global innovator in leadership education. The Institute will support, expand, and bridge the successful existing curricular and co-curricular programs across the university

---

<sup>1</sup> We had insufficient time to assemble a full list of DU courses, research, and other programs related to civic identity and citizenship — but the campus houses many such activities on which future programs will build.

geared toward public leadership development (described below), while also supporting faculty research that informs and strengthens these programs.

- The DU Grand Challenges (DUGC) university-wide initiative, run by the Center for Community Engagement to advance Scholarship and Learning (CCESL), supports students in the development of their identity as a public good scholar through the **DUGC Student Scholars program**. This program enables undergraduate students to learn more about the social justice issues that matter to them, how to apply their academic learning to those issues, and develop concrete skills and tools for making change in partnership with communities.
- DU's **Leadership Studies Program** offers an immersive 24-credit academic minor that equips students to become inclusive community change makers who strive for a more equitable and just world. The curriculum prepares students for effective civic participation and leadership, with the necessary skills in critical thinking, self-discovery and identity development, human design thinking, collaboration, conflict resolution, and cultural competence.
- DU is poised to initiate a **Public Service Internship program** to enhance students' civic identity development and provide them with valuable work experience through public sector service. The internships connect students with opportunities in municipal, county, state, and federal government agencies, with placements designed to enhance students' understanding of the importance of public service, community problem-solving, and government decision-making.

**Political Efficacy:** Individuals are more likely to engage in politics and public life when they feel a sense of efficacy associated with their actions. Today's political environments, characterized by worsening polarization, seemingly intractable policy and governing challenges, mis- and disinformation penetrating both traditional and social media platforms, and the increasing concentration of political and economic power held by privileged elites, undermines this sense of efficacy, especially for younger populations. The Institute will support the expansion of existing and planned programs aimed to enhance students' sense of political efficacy, including:

- The Institute would coordinate several efforts to examine political efficacy via the Center on American Politics (CAP). CAP would lead a program to conduct a broad, nationally representative survey of college students to understand students' attitudes and expectations toward democracy and their own ability to affect political outcomes. Beyond this, CAP would coordinate with other campus partners in cataloging past efforts to protect democracy from threats within the US and elsewhere to better understand what sorts of approaches have been most effective.
- The University of Denver is home to the curricular initiative titled ***Youth Voices in El Movimiento***, which introduces undergraduate students to the ways that El Movimiento, the Chicano movement for citizen rights, has unfolded in the Rocky Mountain West over the past 50 years. This program aims to introduce 12 new courses over the next two academic years in History, Anthropology, Sociology, Spanish Languages and Literatures, and Media, Film and Journalism Studies. DU students will be able to take courses that immerse them in archives and involve them in collecting oral histories with those who had been involved as young people in significant movements for democratic engagement. This project will result in resources for Denver Public Schools, seeking to fulfill the HB 1192 mission to support the "inclusion of matters relating to American Minorities in the teaching of social contributions in history and civil government in public schools."



- The Institute will further advance political efficacy by supporting connections between DU students and global democracy leaders, such as those who visit the Korbel School as part of its Denver Democracy Summit and the Sie Center’s International Global Leadership Initiative.

**Civil Discourse:** An integral part of the University of Denver’s work on democracy comes in the form of a range of initiatives on civil discourse. Each of these initiatives represents a distinct attempt to strengthen civic culture in our community and to thereby contribute to stanching the detrimental impact that a refusal to engage in civic dialogue and the tendency to retreat instead into polarized echo chambers has on the state of our democracy. Our collective work on civil discourse rests on the conviction that healthy democracy requires that while we may disagree vehemently about what is to be done on the collective challenges that face us, we understand that disagreement is inevitable and embrace the exchange of ideas necessary to keep the system working. We recognize, however, that civil discourse need not be genteel; and that appeals to civility can be used to narrow debate and to silence worthwhile protest and dissent. Our overarching goal is to make space to hear all voices, in the interest of vigorous, robust, and respectful civic exchange.

The suite of civil discourse-related activities already underway at the University of Denver will comprise one pillar of the civic identity and citizenship program. The Institute will enhance the work associated with each of these components and, crucially, help to draw linkages across this work in order to measure and advance University-wide outcomes related to civil discourse. Ongoing work under this pillar includes:

- The **global-to-local civil discourse initiative** housed at the Scrivner Institute and the Korbel School comprises three series that aim to foster civil discourse in the public policy realm. The Denver Dialogues series is a partnership with four premier U.S. think tanks — the American Enterprise Institute (or AEI), the Aspen Institute, the Hoover Institution, and New America — that is dedicated to engaging in and modelling civil discourse about major issues facing our nation and our world. The Colorado Project, launching later in 2023, will convene civic, political, and private sector leaders from around the state and region to focus intently on a core series of locally salient public policy challenges. And the Scrivner Policy Roundtable is a quarterly event series that fosters a collaborative research and learning network among local Denver Metro policy actors and organizations, allowing a space for them to learn from each other’s work and share substantive dialogue about local issues.
- The **debate across the curriculum initiative** works via the undergraduate classroom and in partnership with Braver Angels, a national nonprofit organization committed to defusing affective polarization, to increase our students’ skills in civic dialogue and debate while promoting reflection on the demands of civil discourse in a deeply pluralistic polity. Importantly, these debates are framed and pursued not as competitions but as collective search for truth. One core premise of this approach is that — as we know from decades of research — direct, active participation leads to lasting attitudinal and behavioral shifts in ways that passive engagement does not. Classroom debate has a proven track record for fostering critical thinking, moral development, and the skills and dispositions necessary for civil engagement.
- The **belonging and expression initiative** offers a prototype framework for exploring the intersections of belonging, diversity, equity and inclusion, identity, intersectionality, and free expression, alongside a wide range of other important values associated with each. Developed as a partnership between the Faculty Senate’s Freedom of Expression committee and the Undergraduate Student Government, the project provides individuals and groups—including across a range of

curricular and co-curricular spaces—a toolkit of shared vocabulary and short exercises for exploring some of the insurmountable tensions that will arise in any civic space characterized by intersectional identities and divergent positionalities in a context that places strong value on civil rights, freedom of religion, freedom of expression, and social justice.

**Assessing What Works in University-Level Civic Education:** As DU expands and develops democracy-oriented educational programs, there is an opportunity to advance knowledge on the effectiveness of these programs for shaping attitudes and behavior toward fellow citizens, civic participation, public service, and leadership. Other universities along the Front Range and across the country are undertaking related work in this area, via different models and with different communities, stakeholders, and goals in mind. DU has the opportunity to play a leadership role in forming a higher education collaborative that collects and shares knowledge about approaches and outcomes related to these efforts.

### **III. Core Theme #2: Democratic Institutional Renewal**

The impact of engaged citizens is ultimately limited if democratic institutions lack strength or do not function as intended. In many countries around the world, including the United States, democratic institutions have come under assault from both political elites and grassroots populist movements. The renewal and fortification of democratic institutions requires broad yet rigorous analysis of institutional behaviors, noting successes and failures across the world's democratic communities; a deeper understanding of the impacts of technology and media/information ecosystems on democratic institutions; attention to the everyday social context — including everyday beliefs and practices — that support or undermine democratic institutions; and consideration of the extent to which democratic institutions can address complex policy challenges such as climate change, social division, and economic inequality.

DU already possesses a strong foundation on which to build new and strengthened programs focused on democratic institutional renewal. The primary campus divisions involved include the Josef Korbel School of International Studies (Korbel), the College of Arts, Humanities and Social Sciences (CAHSS), and the Sturm College of Law. Within CAHSS, the Department of Political Science has an especially high concentration of faculty invested in the theme of democratic institutional renewal, including dedicated courses on domestic and international political institutions and an established partnership with the Democratic Erosion Consortium based at Brown University. Faculty in History, Communications, Philosophy, and Religious Studies also teach courses and conduct research related to this theme. There are also a number of existing centers and programs, primarily at the Korbel School, that relate to this theme, including the Center on American Politics at the Scrivner Institute, the Climate and Democracy Program, the Pardee Center for International Futures, the Sie Center, the Institute for Comparative and Regional Studies, the Colorado Project, and the Denver Democracy Summit. At the Law School, the Constitutional Rights and Remedies Program, the Rocky Mountain Land Use Institute, and the Vanda Center for International Law are also engaged in democracy-related activities.

The Institute will establish DU as a hub for cutting-edge research on democratic institutions across time and space — and provide programs through which the knowledge created by DU faculty research can be used as a basis for educational and public outreach programs that equip students with the knowledge and tools required to reinvigorate and strengthen democratic institutions. The Institute will aim to provide a nuanced, interdisciplinary, and comparative examination of democratic institutional behavior. To do this, we propose to marshal existing faculty expertise to compare democratic institutional functioning across place (local, national, and international), time (shorter term and longer historic scopes),

institutions (formal and informal), and professional fields (formal state and non-state actors), noting how larger contextual factors (e.g. technological, economic, and demographic changes) affect the behavior of actors at all levels and thus the outcomes that are produced. Specific areas of concentration around democratic institutional renewal are proposed in the following areas:

**Colorado as a laboratory** for effective institutional and governance approaches for other communities across the world. The Institute will support a range of Colorado-focused activities from across academic units with the aim of developing integrated insights into Colorado's historical and contemporary path toward becoming a state with notable policy achievements and innovations in democracy. For example, the Institute would develop joint programming around the following existing or planned activities that, collectively, would provide a holistic view of democratic governance in Colorado for both DU and broader Colorado communities:

- The History faculty's engagement with the State Historians Council, which as part of History Colorado seeks to broaden the reach for western and Colorado history, and promotion of historical work that speaks to the present state of democracy in Colorado and beyond.
- Understanding and promoting the resolution of conflicts among diverse populations, such as through the study of land use at the Sturm College of Law's Rocky Mountain Land Use Institute. Local government and land use concerns often are at the front lines of democracy, engage some of the most difficult conversations and heightened passions in the political process, and can challenge our assumptions about how democracy should work. States like Colorado can establish approaches that can bridge divides and create respect and civil discourse.
- The Colorado Project, convened by the Scrivner Institute of Public Policy, aims to facilitate a gathering where leaders from across the public, private, and civic spheres with a range of political perspectives can come together to promote shared democratic objectives for the future; and to build a good practice framework for convenings of community leaders that reduce polarization and improve democratic governance.
- Research on the state of democracy in Colorado in conjunction with the DU Democracy Dashboard project (see below). Where are Colorado's democratic strengths and weaknesses compared to other U.S. states? How can knowledge of democratic institutional renewal outside of Colorado inform local policy and institutional reform efforts?

**American Democratic Institutions:** DU has much to offer in terms of historical, religious, social, economic, cultural, philosophical, and political perspectives on American democracy. The Institute would support opportunities to integrate knowledge across these disciplines.

A core programmatic feature of this integration would be the **DU Democracy Dashboard (3D)**, administered through the Center on American Politics. The 3D initiative would track and catalogue the health of democratic institutions in the fifty American states and elsewhere. This initiative would involve training 15–20 undergraduate students each year to gather both quantitative and qualitative indicators of democratic health, including ease of voter participation, the quality of political journalism, accountability in elections, anti-democratic language in state party platforms, debate over party platforms, competition in party primaries, and more. Several postdoctoral scholars would help to oversee the training of the students and maintain the available data. The 3D would coordinate with faculty members who work on political maps, geographic information software, and those in Emergent Digital Practices to produce a compelling and accessible on-line dashboard that can be utilized by

journalists, students, scholars, and policymakers around the world. This information would inform reports, scholarship, and public events at the university.

The Institute's work on American democratic institutions would also involve significant internal and external outreach. Its core findings and insights would inform the civic identity and citizenship programs described above, as well as the international comparative and regional programs described below. Outside DU, the Institute's affiliated faculty and students would engage with the Center for Civic Engagement, which sponsors the "We the People" program in high schools that gives students taking AP Government the opportunity to dive deeply into constitutional questions, particularly those around governance, civil rights, and constitutional history. The Institute would support faculty involvement, helping these students understand problems ranging from the Constitutional Convention to issues of representation, speech, distribution of powers across time.

**Democratic Erosion & Renewal in Comparative Perspective:** Comparative analysis of democracy across the globe enhances understanding of current democratic challenges – and opportunities for resilience and renewal – both at home and abroad. Within the Korbel School and CAHSS, there are numerous faculty engaged in innovative research, education, and public outreach related to the state of democracy across the world. Recognizing that the renewal of democratic institutions represents a global challenge, the Institute would support a range of programs that would establish DU as a leading voice on democratic institutions around the world, including:

- As part of the **Democratic Erosion Consortium (DEC)** – a partnership of researchers, students, policymakers, and practitioners from countries around the world who collaboratively marshal evidence and learning to address the crisis of democratic erosion and to increase opportunities for democratic resilience -- faculty in Political Science contribute to global efforts to enhance research and education on democratic backsliding. As participants in this program, University of Denver undergraduates contribute to democratic erosion research, attend international conferences on institutional dimensions of democratic erosion, and connect with other students studying these topics across the world. Institute support would enable DU to expand these programs, deepen connections to the DEC headquarters at Brown University, host conferences, and develop associated research programs and outreach.
- The Pardee Center at the Korbel school develops innovative **models of the future of inclusive governance** including work integrating socio-political indicators into models of shared socio-economic pathways that guide international climate policy. The Institute could support the Pardee Center's effort to integrate models of climate change, economic trajectories, socio-political instability and democracy to better understand threats to democracy across the world – and interventions that could halt or slow these threats.
- Also hosted at the Korbel School, the **Denver Democracy Summit** brings together academics, civil society leaders, and policymakers to reflect on the state of democracy in communities and countries across the world. With support from the Institute, the Democracy Summit could expand participation, incorporate faculty workshops, and connect to a larger breadth of DU's democracy-related research and programs.

**Professional Practices and Democracy:** In their professional training and capacities, how do lawyers, social workers, civil servants, educators, international/diplomatic workers, natural resource managers, and private sector actors support or hinder democracy and democratic institutions through the course of their work? This program will unite faculty and students across professional and academic programs at

DU to better understand the roles of different professions and actors in creating, sustaining, threatening, and changing democratic institutions and principles via the choices they make at multiple levels. Such work can cover a range of possible avenues, including, but not limited to investigating changes in the training provided, the various professional networks and institutions created, the resources accessible, and the rules and norms governing the professions implicated in fostering and sustaining democracy.

#### IV. Key Activities

The Institute will engage in a range of education, research, and public engagement activities around the themes outlined in previous sections. The core activities will include the following:

- **Interdisciplinary Certificate in Democracy Studies:** Create a “Democracy Studies” certificate/micro-credential available to students who take a minimum number of cross-listed Institute related seminars,
- An “**International Democracy Quarter**” hosted at DU for visiting students and professionals from across the world, the culmination of which is an International Student Summit, perhaps co-occurring with the Denver Democracy Summit.
- **Fellowship Programs:** The Institute would support several types of fellowship programs:
  - Create a rolling series of **internal**, two-year termed, Democracy Fellowships with half of the fellowships turning over each year, and the fellowship positions proportionally distributed across participating academic units.<sup>2</sup> The internal fellowships will include course buyouts, summer salary, up to \$20k in research funding, and paid research assistants. Faculty fellows will be required to teach one cross-listed seminar per year grounded in the fellow’s democracy-focused research project and to present their research in a [Democracy Seminar](#) open to DU faculty and students, as well as in a public-facing presentation.
  - Create a rolling series of **external** Democracy Fellowships for senior faculty or practitioner fellows with a requirement to teach one cross-listed seminar per year grounded in the fellow’s democracy-related research project to increase student benefit. The Fellowship would include up to \$50k match to one’s home institution salary, up to \$15k in research funding, and funding for paid research assistants. The Fellow would be required to present their research in a [Democracy Seminar](#) open to DU faculty and students and to give a public-facing presentation.
  - A **Junior Faculty Fellow** who would teach one cross-listed seminar per year grounded in the fellow’s democracy-related research project. The Junior Fellow would receive up to \$40k to match their home institution’s salary, up to \$15k in research funding, and funding for paid research assistants. The Junior Faculty Fellow would be required to present their research in a [Democracy Seminar](#) open to DU faculty and students and to give a public-facing presentation in.
  - **Postdoctoral Fellows, Predoctoral Fellows, and Student Fellows** who would contribute to faculty-led research programs, serve as mentors and leaders for student programming, and assist in the organization and execution of public engagement events. A subset of these fellowships would include “Democracy and Diversity Fellows” aimed at increasing the number of faculty who will further DU’s goals of diversity, equity, and inclusion by attracting and hiring candidates with outstanding scholarly records. The program would add needed faculty lines across the social

---

<sup>2</sup> Proportionally distributed as defined as the number of fellowships roughly matching the number of faculty in each academic unit.

sciences and provide the opportunity for new courses and mentorship opportunities for our students in currently underrepresented areas.

- A **mini-grants program** to fund competitive research awards for faculty in any discipline who wish to engage with the Institute's themes.
- **Community and Public Engagement:** The Institute will serve as a locus for a robust program of community and public knowledge-sharing and engagement. A range of speaker series and public events will include: a Democracy Seminar, where Institute-affiliated faculty, fellows, and students will present and discuss their research; quarterly Institute-branded public events; regular community convenings; etc. The Denver Democracy Summit, convened annually by the Korbel School, would also be an important fixture on the Institute calendar.

## V. Broader Impacts

In addition to contributing to DU's reputation for excellence in civic education and democracy research, the Institute will have a range of secondary impacts across DU and beyond.

First, the Institute will enhance the 4D experience for DU students. DU has the opportunity via the 4D experience to develop a model for instilling in students the values of citizenship and other forms of democratic participation and giving them the tools to acquit their civic duties and pursue public-minded lives and careers of purpose. Also, the Institute will support new intellectual growth via cross-curricular educational programs and opportunities to participate in new research programs, in turn fostering opportunities to better understand the ways that civic interactions and political institutions shape individual and societal health and wellness.

Second, the Institute will enhance DU's commitment to the public good. Democracy has both intrinsic and instrumental value for the communities that adopt and maintain it. DU can offer a unique, neutral convening platform that connects scholarly approaches to the broader public realm, with an emphasis on empirical evidence and interdisciplinary frameworks. In doing so, DU has the opportunity to contribute to the public good via research, curriculum, and practice on democratic discourse and participation.

Third, robust democracy rests on the inclusion of diverse perspectives and lived experiences. DU has the opportunity to model a DEI-centered set of approaches to renewing and safeguarding democracy by incentivizing research on just, inclusive, and equitable democratic institutions and practices, and incorporating this research into educational and community programs. Cultivating these areas of excellence will help to make DU attractive to students, faculty, and staff who identify with groups that are under-represented in academia, thus enhancing compositional diversity.

## VI. Organizational Structure

The working group discussed two potential models of organization, outlined briefly here. In whatever form it takes, the Institute would embrace principles of inclusion and equity among its contributors, ensuring that faculty, staff, and students from across campus have the resources and support required for meaningful and effective engagement.

1. Create an umbrella organization to administer, raise funds, and coordinate activities between existing, and possible future, Democracy-related centers (e.g. Center on American Politics, etc.) and to administer the programs outlined above. Details should be determined later, but the top leadership

position would rotate between Korbel and CAHSS, and come with a 0-0-2 course load and Director stipend. The Institute design would serve multiple aims. In terms of scholarship, institutional disparities, and University reputation and standing, it would put all DU faculty on equal footing in terms of research support, teaching, and service obligations. Doing so would enable a broad range of DU faculty to advance their research and thus advance the Institute's and the University's mission, reputation, and status. The Institute would help to build campus-wide community and provide intellectual engagement for faculty across the University.

2. Develop a flatter organization in which the Institute's activities and linkages would be organized around two centers, each corresponding to a central Institute theme. The Center on Civic Identity and Citizenship, based in the College of Arts, Humanities & Social Sciences, would take the lead in developing and coordinating the civic identity and citizenship-focused programming described above. The Center for Democratic Institutional Renewal, based at the Josef Korbel School of International Studies, would administer the Institute's programming on democratic institutional renewal. Each Center would foster innovative interdisciplinary research, education, and public engagement, and each would provide a hub for collaborative work to build on the wide range of democracy related initiatives at the University of Denver to collectively establish DU as a leader in democratic studies. Each Center would include a faculty director, 2–4 staff members, and affiliated faculty, postdoctoral fellows, and students. The Governing Council of the Institute would include Deans of represented schools, the two Center directors, senior staff, and appointed affiliated faculty from across campus. The governing council would establish guiding principles for the execution of the Institute's activities, advise on strategic, programmatic, and administrative decisions, and offer hands-on support where needed.

## **VII. Resources & Sustainability**

Funding and sustainability of the Institute rests on a three-pronged approach. First, fundraising support from the DU Advancement Office will be essential for initial development of the Institute and to sustain the administrative structures for an initial period of around 5 years. Second, we envision that Institute leaders will pursue grants and private donations that support collaborative and interdisciplinary programming, with potential grant funding from philanthropic organizations with democracy-related grant programs such as the Ford Foundation, the Hewlett Foundation, the Carnegie Corporation, the Proteus Fund, and the New Venture Fund. Third, individual faculty and staff within the Institute would pursue public or private funding for their own research and educational programs that form part of the Institute.

The integrated and networked nature of the Institute proposed here will contribute to the sustainability of the initiative. It makes it possible for DU to respond nimbly flexibly to new and emerging issues in the democracy space, connecting relevant DU units and their partners at the relevant time, while enabling work to ebb and flow adaptively.

The Institute's focus on interdisciplinary and experiential student-facing programs will attract student interest and support enrollments; we also anticipate that the Institute will attract student scholarship funding. The Institute's investment in and support of faculty, postdoctoral fellows, and students working on the themes of civic identity and democratic institutional renewal will establish DU as a leader in the higher education space and send a strong signal about its commitment to renewing democracy through innovative interdisciplinary research, education, and public engagement.

# Quantum @ DU

White Paper submission, University of Denver 2023, *Ideas to Impact*

**Team Leads:** Prof. **Barry Zink** (Physics & Astronomy, [barry.zink@du.edu](mailto:barry.zink@du.edu)), and Prof. **Mark Siemens** (Physics & Astronomy, [mark.siemens@du.edu](mailto:mark.siemens@du.edu))

**Current Additional Team Members:** *Note we continue to grow our list of participants as the project moves through the **Ideas to Impact** process.* *Physics & Astronomy:* Assoc. Prof. **Xin Fan**, Asst. Prof. **Pavel Salev**, Assoc. Prof. and Chair **Davor Balzar**; *Chemistry & Biochemistry:* Assoc. Prof. **Michelle Knowles**, Asst. Prof. **Scott Horowitz**, Assoc. Prof. **Brian Michel**, Prof. **Gareth Eaton**, Prof. **Sandy Eaton**. *Biological Sciences:* Asst. Prof. **Erich Kushner**. *Sturm School of Law:* Asst. Prof. **Zahra Takhshid**. *Emergent Digital Practices:* Teaching Prof. and Program Director **Bill Depper**; *Philosophy:* Assoc. Prof. and Chair **Marco Nathan**; *Office of Teaching and Learning:* Director of University Teaching **Virginia Pitts**.

## Why this topic?

Society stands on the brink of a transition into a quantum age. Just as the development of digital computer technology based on semiconductors fueled immense growth and change and enabled our current age of information, replacing the simple 1's and 0's of digital technology with the unique laws of quantum mechanics will enable massive leaps in information processing that will reorder life as we know it.

To equip students to excel in this quantum world, DU must grow in research and experiential teaching capabilities across disciplines from Physics and Chemistry to Biology, Psychology, and Law. Just as important, and where our efforts can be most unique, is in supporting and exploring the connections between these disciplines, by not only asking and exploring scholarly questions, but teaching students in Quantum degree programs of these vital intersections.

This *Ideas to Impact* project will require infrastructure investment, faculty development, and student support, with the possibility to build new degree programs at every level and across a broad range of disciplines. Quantum @ DU will catalyze our unique opportunity to build programs on cutting edge quantum research that explore the entangled impacts across every area of the human experience.

In the near term, Quantum @ DU will support critical "shovel-ready" needs of the faculty, students, and staff already working in quantum related areas. These include: Laboratory Infrastructure for Quantum Materials and Information, Postdoctoral Fellowships in Quantum Concepts, Endowed Faculty Positions, Education and Interdisciplinarity in Quantum Concepts and Connections, and administrative and staff support to build interdisciplinary quantum connections.



**Why now? What will be the outcomes and impacts of this initiative on society?**

Quantum Information and Computing have already begun to change the world. Just the past few years have seen milestone developments in the fundamental science, such as the first truly secure quantum communication from earth to a satellite (achieved by Chinese scientists in 2020), and the first commercial implementation of quantum computers (claimed by several companies starting around 2019 including IBM and D-wave), leaving countries scrambling to compete in this new realm to assure their geopolitical and economic stability and security. In part in response to Chinese investments and advances in quantum science, the United States has sharply ramped up federal spending in quantum areas, including the National Quantum Initiative Act (2018, \$1.2 Billion in investments in quantum information science) the “Endless Frontier Act”, S.1260 - United States Innovation and Competition Act (2021, >\$100 Billion channeled through the NSF), and the recent CHIPS act (2022, \$280 Billion for advanced semiconductor manufacturing, research and development, and workforce development).

Such large investments are understandably motivated by the simple promise and myriad impacts of computers thousands of times more powerful than the current state-of-the-art, and communications secured by the fundamental physics of quantum mechanics, rather than simple complexity of classical calculations.

The Quantum @ DU initiative will provide necessary infrastructure and resources for DU faculty and other researchers to be competitive for this research funding. In particular, it will catalyze the existing seeds of quantum research across campus to form a unique center for cross-disciplinary quantum science and societal implications. Additionally, the infrastructure, equipment, and novel educational programs from Quantum @ DU will equip DU students to compete for jobs as leaders in new companies and industries that will form as quantum ideas reorder society, and provide resources and general education to all DU students so that they are comfortable with quantum applications in diverse contexts, and judging potential implications.

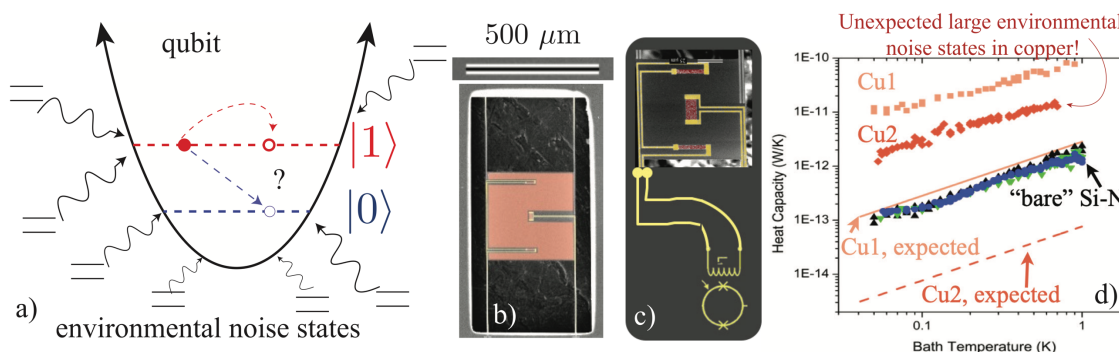
**Why DU? What are DU’s current strengths in the area of focus? How does DU compare/ compete locally and nationally on this subject matter domain?**

While quantum research is booming across the country, and CU-Boulder has traditionally led the region in this area, DU is in a unique position that can be leveraged for tremendous growth and impact in quantum science research and education. First, the current research efforts in Quantum concepts at DU are unique and creative in ways that complement, rather than compete with, the work done at other Colorado schools. The work at DU is poised for rapid and cohesive growth, given strategic investment and intentional design of planned interdisciplinarity. Second, the existing DU culture, grounded in the liberal arts ethos, allows flexibility and lowers institutional barriers for exploring meaningful interactions across disciplines. We will be able to build on this culture to create a truly unique environment where students and faculty in dramatically different areas of study can identify and study the impacts of their work across fields. For example, students in a future degree program in Quantum Materials and Information Science could take required courses in the legal and social impacts of quantum technology, and in the effective teaching and learning of quantum concepts at all levels. Third, our smaller size also

helps enable participation of more diverse faculty and student populations. This pattern has already been demonstrated in several DU programs, which often produce higher percentage of graduates from underrepresented groups in STEM, for example.

Research and teaching in Quantum concepts is already ongoing across a range of schools and colleges at the University of Denver, including Natural Sciences and Mathematics, Law, Humanities and Social Science, and others. Some specific areas of excellence in Quantum @ DU are highlighted below.

#### Research highlight 1: Thermal probes of decoherence in qubit materials

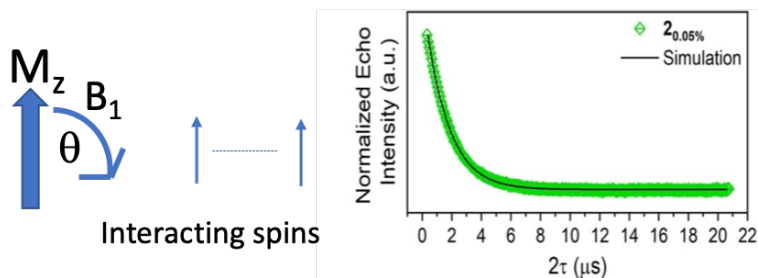


The **Zink** lab has developed unique tools to study the fundamental physics of noise sources in materials at temperatures well below 1 Kelvin, where quantum bits formed from superconducting circuits are often operated. Panel a) of the figure above depicts the interference of environmental noise states with the two state system that forms a qubit. These interactions cause *decoherence*, where the qubit prepared in a given state (here the  $|1\rangle$  state) forgets its quantum information due to environmental interactions. The Zink group, with collaborators at NIST Boulder, developed micromachined thermal platforms (seen in SEM micrographs in panels b and c) measured with SQUID noise thermometry, to study heat capacity and thermal conductivity between 50 mK and 4 K. Panel d shows that even a simple metal such as copper can show an unexpectedly large heat capacity, indicating unexpected environmental noise states.

#### Research highlight 2: Resonant probes of decoherence in qubit materials

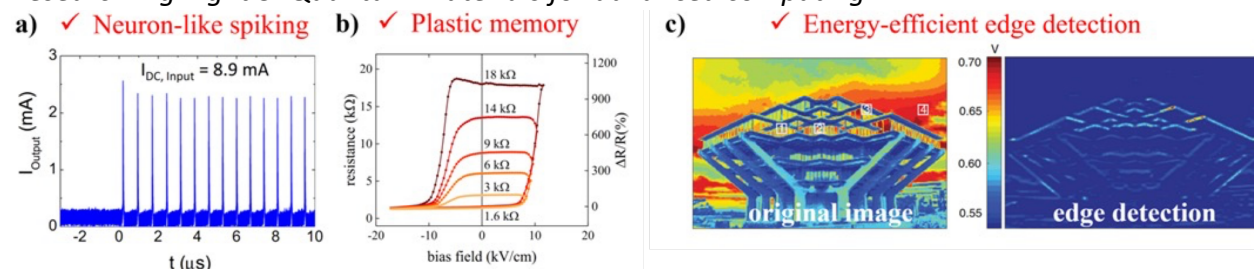
The **Eaton** lab at DU is one of the world leaders in measuring spin decoherence via electron paramagnetic resonance (EPR) spectroscopy. Their results are used by other labs around the world to design quantum “qubits.” The interaction of two (or more) unpaired electrons is an example of quantum entanglement.

Building on basic understanding of spin-spin interactions the DU EPR Center is poised to contribute to development of quantum computing. Informal, noncredit instruction in this area has been a feature of the EPR



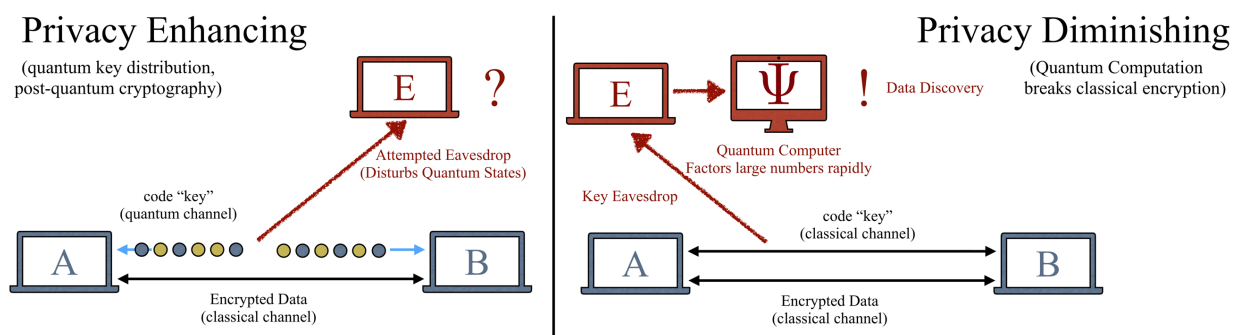
Center for over a decade and could be incorporated into a coherent program of instruction in quantum computing. This could be expanded to include undergraduate laboratory instruction.

### Research highlight 3: Quantum materials for advanced computing



Asst. Prof. **Pavel Salev** is building a new experimental lab that will explore quantum materials as novel computational platforms. In recent years, there has been tremendous progress in the development of artificial intelligence algorithms, including neuromorphic and reservoir computing. Large-scale implementation of such algorithms is hindered, however, by the limitations of silicon-based technologies. Because of the high-power consumption and large number of components in transistor circuits, building a computer that can rival the complexity of the human brain necessitates the search for new material platforms beyond traditional semiconductors. Quantum materials exhibit a plethora of exotic physical properties stemming from the fundamental electronic interactions at the atomic scale. Utilizing the functional properties of these unusual systems enables the design of unconventional computing elements that can replace complex transistor circuits. The figure above highlights some of Prof. Salev's work: a) demonstrating quantum-material-based devices that can mimic the spiking of biological neurons; b) emulate the memory plasticity of biological synapses, and c) provide the energy-efficient hardware implementation of the edge detection algorithms used in the neural networks. Quantum materials research is a rapidly growing field that challenges the established approaches of electronics design. The unique work at DU will focus on enabling (spin + charge) computing platforms in magnetically ordered metal-insulator transition systems – a special class of quantum materials where the electrical conductivity can be changed by orders of magnitude by controlling the electronic interactions.

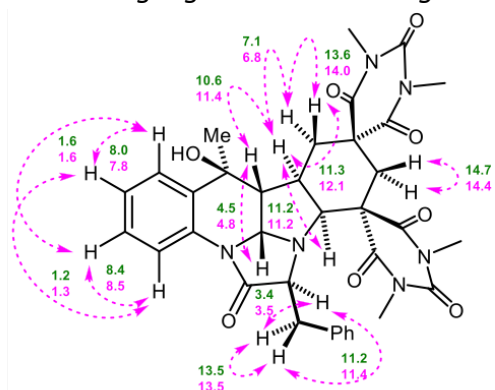
### Research highlight 4: Quantum Privacy at the intersection of commercial law and technology



Asst. Prof. **Zahra Takhshid** is exploring far-reaching implications of quantum technologies on law, which highlights one of many ways developing quantum technology can impact society far beyond the physics lab. The image above summarizes one area of her focus: exploring which quantum technologies could enhance privacy, and which could diminish or eliminate it. Quantum

key distribution uses the essential physics of quantum measurement--the alteration of a quantum system by the act of measuring it-- to ensure data privacy. However, possession of a large scale quantum computer by a potential eavesdropper on classical network communications potentially invalidates even the best classical encryption schemes because quantum computers excel at factoring large numbers, which is the essential mathematics of current classical encryption. As **Prof. Takshid** states in a forthcoming review essay ("Quantum Privacy" in *The Cambridge Handbook of Emerging Issues at the Intersection of Commercial Law and Technology*, 2023), equipping legal scholars and practitioners with knowledge of quantum concepts helps reduce their treatment as "exceptional" technologies, which can prevent thorough and equitable examination of the legal impacts of the technology. She also cites the critical role of interdisciplinary work, such that the legal academy can "have a hands-on introductory understanding " of the science behind quantum technologies. This again highlights the unique and impactful role DU can take by enhancing these interactions.

#### Research highlight 5: Nuclear Magnetic Resonance (NMR) research in using quantum chemistry

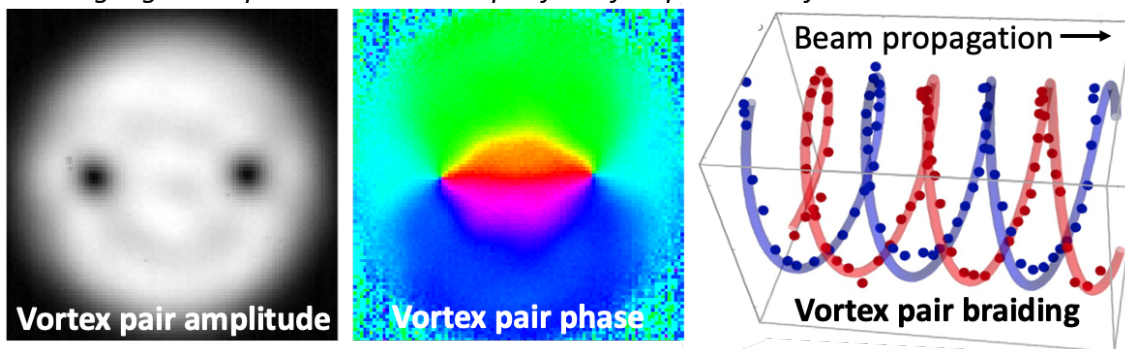


Spin-spin coupling (**Experimental** **Calculated**) in a polyheterocycle

allow continued growth in the Chemistry & Biochemistry Department.

The Department of Chemistry and Biochemistry at DU has seven faculty currently engaged in research using quantum chemistry via NMR spectroscopy. These faculty include **Scott Horowitz** (nucleic acid biophysics), **Sunil Kumar** (aberrant protein-protein interactions), **Allegra Aron** (metallophore discovery), **Andrei Kutateladze** (quantum observables predictions for small molecules), **Brian Michel** (biological catalysts), and **Brady Worrell** (polymer analysis), and new faculty that will likely be hired to use NMR within the next two years. NMR spectroscopy's growth at DU outpaces our current instrumentation, and a new spectrometer is needed to

#### Research highlight 6: Optical vortices as a platform for quantum information



The **Siemens** lab, in work funded by the NSF and the W. M. Keck Foundation, is pioneering the use of optical vortices for quantum simulation of superfluid hydrodynamics, and also exploring the possibility that these optical vortices could be "anyons" that are the basis for topological quantum computing. They have demonstrated many of the steps required for topological quantum computing: full control over arbitrary vortex lattices (setting up the quantum problem),

braiding of vortices (the calculation to be performed), and fusion of vortices (problem readout). This promising approach is also completely novel: they are currently the only ones in the world working on implementing quantum computing algorithms and gates with optical vortices. The optical vortex quantum simulator is low cost, accessible and flexible, room temperature, and robust to errors because of topology and photon insensitivity to the environment; this is in contrast to the current state-of-the-art methods for quantum computing that require ultra-low temperature and vacuum to isolate qubits from the environment – and yet still require a factor of 10 redundancy for error correction.

These highlights feature only a few of the faculty already working on quantum concepts. These faculty are respected leaders in their respective sub-fields, with established track records of obtaining external funding for their research and publishing in high-impact peer-reviewed journals; however the transition to quantum research demands new infrastructure and nanoscience tools that are widely unavailable at DU. The vision of the Quantum @ DU initiative is to provide the infrastructure and institutional support to bring together these individuals into a cohesive and sustainable core of quantum research.

**With regard to DEI values and principles, how will this project, if funded, increase compositional diversity at DU as well as inclusiveness and justice at DU?**

The society we will face in coming years and decades stands to be shaped and transformed by quantum concepts in ways not yet known. Achieving true equity and inclusion in this society requires empowering a diverse student body and faculty with the knowledge to compete for the best jobs and tools to answer new fundamental questions. Quantum @ DU is an essential component for achieving this equity and inclusion.

To help achieve these goals, we will dedicate one speaker slot each year in the planned Quantum @ DU seminar series to discuss DEI in quantum. Attendance at this seminar will be required for any related degree programs, and DEI concepts will be integrated into the quantum curriculum.

The envisioned Endowed Professorships are an important route toward manifesting our DEI goals in faculty hiring. In recent years hiring excellent diverse faculty is extremely competitive, and DU currently simply cannot compete for these candidates (we have recent direct evidence of this). Philanthropic endowment of competitive named professorships at all seniority levels would help DU compete and take advantage of our possibilities in this area.

**How does this topic further DU's commitment to the public good?**

As with Diversity, Equity, and Inclusion, quantum concepts have impacts on the public good that are potentially profound, but not yet well understood. The full range of proposed activities to be supported by Quantum @ DU are motivated by the public good: from uncovering new quantum nanoscale phenomena in the physics research lab; to studying the societal or legal ramifications

of quantum concepts for privacy, security, or communication; to teaching these concepts and their impacts in the classroom.

Given the life-changing potential of quantum technologies, the public impact of this work is likely to be enormous. One goal will be to prepare DU students to be moral and honest practitioners of quantum science, even in the face of corporate and government pressure. This work toward constructing and understanding quantum ethics is inherently interdisciplinary, and can thrive in DU's environment if institutional structures to support exchange between fields are implemented.

**What sources of external funding are available to support this issue area, i.e., federal and state grant funding, philanthropic funding, other?**

As stated earlier, there are many new federal funding streams supporting quantum information, quantum materials, and development of a quantum workforce, and these continue to grow. Another important aspect of building our capabilities across a range of fields where quantum concepts are explored is to make teams of DU investigators potentially attractive collaborators for many of the very large scale research centers that NSF, DOE, and DOD currently favor as approaches to "grand challenges" such as quantum materials and information. An example of such a program are the NSF Quantum Leap Challenge Institutes. These are large, often multi-university research centers, dedicated to pushing existing boundaries in quantum research, technology, and workforce development. These funding mechanisms often assume that necessary infrastructure is available, but do not provide funding to improve it. Expanding our infrastructure to support our core of quantum-related faculty and growing this group will let DU compete for larger and more sustainable funding streams than has been ever been possible.

**How sustainable is this project? Will it contribute to student interest and enrollments and, ultimately, to tuition revenue?**

The dramatic effects of the classical-computation powered developments in artificial intelligence are currently impacting more aspects of society every day, and certainly focus student interest. The coming impact of similar technologies powered by quantum concepts will exceed this, and student interest in these concepts is already ramping up. As mentioned above, the development of a quantum workforce is a central aspect of many of the new federal funding streams focused on quantum concepts, and DU must take advantage of this to assure our relevance to future student interests. In the short term, we are already working to take advantage of this interest by developing Concentrations and Minors related to Quantum Materials and Information Sciences, but see a critical opportunity to develop additional educational programs. One key focus, if we can develop suitable infrastructure and faculty support, is to implement a Professional Masters degree, that would focus on giving students from a wide range of STEM fields practical knowledge required to be effective in quantum technologies. We see a critical role, and an important point of distinction for DU's degree programs, in adding ethics and social impact to the experiential

learning of superconducting electronics and low temperature physics that would be offered to these new students.

**Likewise, how sustainable is the funding stream after initial investment? Beyond net new tuition, what are the options for grants, contracts, and philanthropy?**

One of the main goals of the Quantum @ DU project is to ensure our ability to access sustainable funding streams well into the future. We have provided detailed information in this area earlier, but will reiterate that the options for federal funding are already a strong motivation to continue DU's investment in this area. We also note that if adequate support is focused to develop a Professional Masters program, the graduates would be a potential pool for future philanthropy.

**Planned Initial Activities and Thrusts**

This project connects a wide range of faculty and units across campus, and it will require significant investment in research equipment and infrastructure, along with other faculty supports. We know of no existing means for the campus to make such a significant and important investment.

Even the near-term needs required to begin the process require very significant investments that require an institutional commitment. We currently envision these taking six thrusts.

1) *Laboratory Infrastructure for Quantum Materials and Information.* Simply put, the kinds of fundamental questions that are of interest in quantum science related areas require state-of-the-art tools that are often lacking here at DU. One early focus will be on developing a Quantum and Molecular Nanofabrication Facility. This clean-room facility will house tools to produce and study the tiny physical, chemical, and biological structures often required to probe and manipulate the quantum realm. This includes advanced photolithography tools, improved materials growth capabilities, and other advanced processing equipment, along with the physical infrastructure to safely and effectively use these tools (temperature regulation, water cooling, vibration isolation, in addition to the clean environment). This facility (to be located in Knudsen Hall or the Physics building initially, and then integrated into a new STEM building in the next 5-10 years) will be open to student and faculty users from across campus by application to the Quantum @ DU team. This thrust will also support additional experimental tools essential to both research and teaching in Quantum concepts. This likely includes tools to create and manage the low temperature environments that house many manifestations of quantum computers (such as a dilution refrigerator), upgraded imaging and spectroscopy tools (including state-of-the-art Nuclear Magnetic Resonance spectrometer and X-ray diffractometer), and expansion of facilities to sustainably perform research in the low-temperature environments required to access quantum phenomena (including additional facilities to recycle liquid helium).



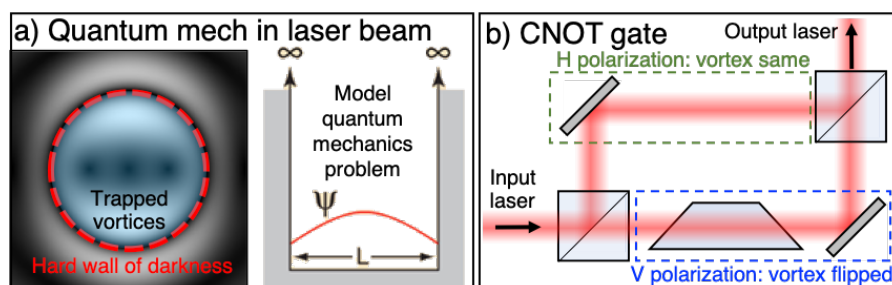
2) *Summer Quantum Research Fellowships for Undergraduates*. Research is one of the most powerful parts of the education that DU has to offer. It provides students with relevant experience beyond the classroom and prepares them for meaningful careers. Unfortunately, current mechanisms to support student research (Undergraduate Research Center's Summer Research Grants, PINS) are not enough to support a student for even a complete summer. We will establish competitive summer fellowships to support undergraduates collaborating with DU faculty on a Quantum research problem in science, policy, law, or social impact.

3) *Postdoctoral Fellowships in Quantum Concepts*. To enable and support the exploration of quantum concepts in research across the full range of disciplines at DU, we envision supporting postdoctoral fellowships. This is a very effective and impactful use of institutional resources, with direct impact on building and improving our research profile, and providing a flexible and quick means for faculty to move quickly into new quantum-related fields. A request for proposals for such positions will be advertised across campus, and selected by the core group of faculty associated with Quantum @ DU.

4) *Endowed Faculty Positions*. Though this aspect is likely out of reach of the expected initial institutional investment, future institutional advancement should target several endowed professorships across the disciplines. Well-endowed named professorships, with competitive salaries and initial equipment and personnel (start-up) budgets are essential to bring high impact talent to campus, individuals who will not only establish cutting-edge research and teaching programs in quantum-related fields, but who will improve existing efforts via collaborations and co-learning. This is particularly important for DU to achieve our stated DEI goals. As mentioned earlier, hiring faculty candidates that enhance our diversity (at every level of seniority) is often so competitive that we simply cannot hire these candidates without additional financial, infrastructure and other resources. These Endowed Faculty Positions would be a game-changer.

##### 5) *Education and Interdisciplinarity in Quantum Concepts and Connections:*

Quantum science and information concepts are notoriously difficult to visualize and observe, especially in experiments that are accessible to undergraduate students. The **Siemens** lab has



recently discovered that the tools they developed for controlling, propagating, and measuring optical vortices comprise a unique platform for observing and manipulating quantum phenomena. Even more exciting, the tools are accessible to undergraduate students from any major and inexpensive (a complete laboratory setup could be constructed with \$5000, 20x less than the cost of a commercial quantum optics education kit). Two of the quantum concepts that can be easily explored are illustrated above: a) by structuring the beam shape, we can model trapped light that simulates the famous "particle in a box" problem of quantum mechanics, and b) classical entanglement can be implemented with polarization and vortex mode, allowing for



real 2-qubit computation. Quantum @ DU will support the development of a series of five hands-on and inquiry-based laboratories. The goal will be to give DU students real intuition in dealing with quantum concepts and computing gates, which will give them a distinct advantage when applying these concepts to real-world challenges.

Consistent with the emerging nature of the field, quantum concepts are taught traditionally in only physics and chemistry departments, and largely ignored in other fields. As society feels the growing pains of the transition to the quantum age, studies of quantum concepts – and their implications – will make their way into many other fields. At DU, we have the opportunity to lead the critical effort to broaden the scope of quantum-related education to other units (such as philosophy, EDP, and Law). We will engage in a redesign of quantum-related education focused on both experiential learning and interdisciplinarity. One particular thrust will be to curricularly design a new quantum game through a multi-college collaboration that attracts students who are not science majors and is both a creative outlet and an educational tool.

If properly supported, Quantum @ DU will build momentum across campus, leading to growing interest in quantum concepts and applications. We envision developing a new SI-Natural sequence of classes “Quantum Science”, which would teach non-science majors to do the following: explain essential quantum science concepts, identify the strengths and limitations of quantum computing, categorize common quantum computing platforms, and appraise the social and moral implications of quantum computing. The classes would be taught by faculty from this interdisciplinary team and use laboratory and game design principles described above. This would provide for campus-wide education and uniquely prepare DU students to be engaged with the implications of quantum science and computing in their individual fields.

*6) Administrative and Staff Support to build interdisciplinary Quantum @ DU connections:* The early stages of the effort to build and explore the interdisciplinary interactions around quantum concepts will benefit from funding and a staff position to manage programs to connect faculty and students. This could include management of a Quantum @ DU Seminar series to bring internationally prominent speakers to campus to meet students and faculty, support for budget development and grant writing for quantum-related proposals, and travel support for students in quantum-related degree programs to present their research in the academic community. Staff support for management and technical assistance with the Nanofabrication facility is also critical for optimal utilization of this resource.