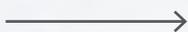
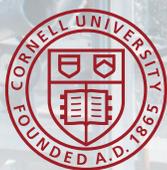


# Roadmap to 2050



*“If you know you are on the right track, if you have this inner knowledge, then nobody can turn you off ... regardless of what they say.”*

BARBARA MCCLINTOCK  
1927 PH.D. & 1983 NOBEL LAUREATE



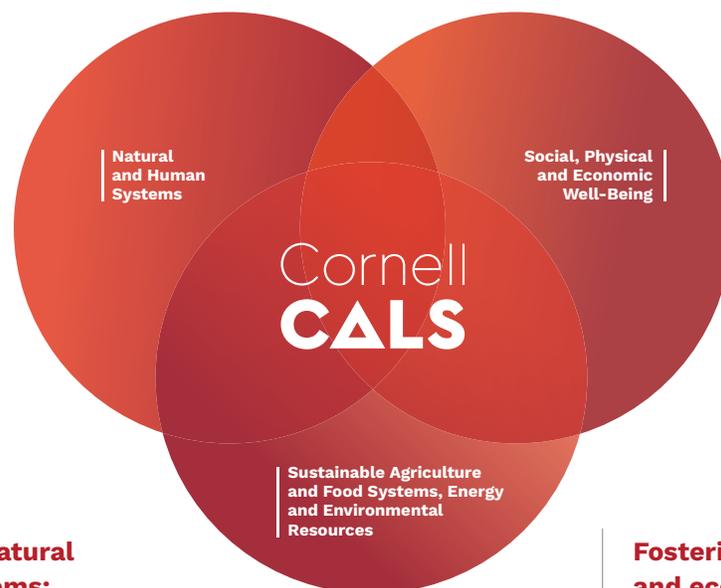
Cornell **CALS**  
College of Agriculture and Life Sciences

Founded in agriculture,  
focused on life

**Life. Changing.**

# A Legacy of Scientific Excellence

Because no single discipline can address the complex problems facing our communities, Cornell CALS researchers collaborate across disciplines. Our focus is to understand the systems that drive the human and natural worlds. We do this to promote the well-being of communities and to ensure access to sustainable food, energy, and environmental resources. Today's scientific community is more interconnected than ever before, and bringing global challenges into focus takes more than one lens. That's why we go beyond the silos of typical academic inquiry, taking a holistic view and concentrating on three overlapping areas of inquiry:



## **Understanding natural and human systems:**

We believe that achieving next-generation scientific breakthroughs requires an understanding of the world's complex, interlocking systems.

## **Stewarding sustainable agriculture and food systems, energy and environmental resources:**

We believe that access to nutritious food and a healthy environment is a fundamental human right.

## **Fostering social, physical and economic well-being:**

We believe that ensuring a prosperous global future depends on the ability to support local people and communities everywhere.

By working in and across multiple scientific areas, CALS can address challenges and opportunities of the greatest relevance, here in New York, across the nation, and around the world.

## **COLLEGE MISSION**

As a premier institution of scientific learning, we connect the life, agricultural, environmental, and social sciences to provide world-class education, spark unexpected discoveries, and inspire pioneering solutions.

## **COLLEGE PURPOSE**

CALS tackles the challenges of our times through purpose-driven science that advances understanding and improves life.

## **COLLEGE CORE VALUES**

Our 10 core values remain unchanged from the 2014 CALS strategic plan. We strive to hold ourselves to these values in all our interactions, everywhere.

- ▲ Seek knowledge.
- ▲ Support free and open intellectual inquiry and expression.
- ▲ Sustain excellence in teaching, research, and public engagement.
- ▲ Use knowledge to enlighten ourselves and benefit the world.
- ▲ Reward and recognize merit, creativity, and innovation.
- ▲ Treat all individuals with dignity, respect, and fairness.
- ▲ Embrace difference and diversity.
- ▲ Promote cross-cultural and cross-national understanding.
- ▲ Be a collaborative, collegial, and caring community.
- ▲ Be accessible and affordable to all who meet high academic standards.



## A MESSAGE

### FROM THE **Dean**

**We live in a highly connected and interdependent world. Science, education, and engagement have strongly shaped our modern society, with academic freedom, collaboration, and basic exploration enabling universities to effect positive change, from local to global scales. As change happens faster and the boundaries between society, technology, and nature blur, many important questions remain for universities in the 21st century.**

How will we create the most profitable and equitable futures, both individually and collectively, by translating basic inquiry into real-world solutions? How will we respond to the great societal needs and challenges of our time in a way that transcends traditional boundaries and conventional thinking? What role will we play in shaping the bright young minds around us, inspiring the next generation of change-makers and global leaders?

Working alongside our stakeholders and partners, the Cornell University College of Agriculture and Life Sciences is addressing these questions head-on. We aspire to solve complex, multidimensional challenges by blending our unique education, science, innovation, extension, and diversity programs. We have deep if not unrivaled expertise in agricultural, life, environmental, and social sciences, with a proven track record of pioneering efforts in scholarship, the student experience, and Land-Grant community collaboration with farmers, producers, communities, and businesses.

This enterprising spirit to make the world better than we found it has been challenging us to think bigger since Cornell's College of Agriculture was established by the New York Legislature in 1904 — a time when about 40% of the U.S. population worked in agriculture.

But just as agriculture, food production, life science, and society have changed radically since the last century, what has kept CALS at the forefront in the past will be necessary but insufficient as we effect change in future decades. The challenges of today are bigger, more abstract, and arguably more pressing than ever before.

Rather, as our work seeks to improve life in this “solutions century” and beyond, I believe we must develop novel pathways for knowledge generation, inspire even greater basic discoveries, and build problem-solving approaches that recognize the interdependency of our local and global milieu. I believe we need to do even more to combine academic fields and move beyond traditional approaches to external funding. New connection points must be co-created within and outside the academy, budding new disciplines of the future that prize full inclusion and freedom of academic thought in our college while challenging our own paradigms of how the world works — and how it can work better for all.

Cornell CALS is poised to expand our horizons to empower our local and regional work's influence on the global population and bring that knowledge back to our home communities. As we broaden our individual vistas every day, and innovate collectively, we will serve those close to Ithaca and around the world with our core strengths and collaborative leadership. By leveraging our expertise in more intentional, actionable ways, we can inspire new fundamental scientific discoveries and identify groundbreaking solutions that truly advance understanding of the natural world and improve life — leveraging our human capacity in uncommon, radical ways.

We began this strategic process in fall 2021 to develop a new vision for Cornell CALS, leveraging our historic excellence for even greater impact and building upon Ezra Cornell's vision “to do the greatest good.” As we examined questions about how the college could become even more future-focused and pioneering, we unlocked newfound inspiration inside and outside academia —

including from more than 700 community members and stakeholder groups who shaped the vision. In spring 2022, faculty and staff committees explored opportunities and barriers, shedding fresh light on our traditional silos of thought, expertise, funding, and structure.

This new roadmap is thereby structured into challenges, strategies, and goals based on a consultative process of engagement. The collective vision of the roadmap is to build on our interdisciplinary approach to education, where half of our majors draw from multiple academic disciplines, including several from outside the college. Through this vision, we aim to create new pathways for transdisciplinary research and innovation that leverage our disciplinary strengths, both deepening and broadening connections to stakeholder communities in New York and worldwide, seeking to serve their needs and involve them in every step of our science. We will also refresh and renew our steadfast commitment to diversity, equity, and inclusion; extension; grant funding; and fundraising, while ensuring our efforts do not disproportionately affect communities in a negative way because of our approach. We will lead through and by collaboration in the “solutions century.”

The heart of this plan also outlines several exciting new “transdisciplinary moonshots” to push new boundaries as we pursue strategic initiatives that build up our institution and enhance our current education, research, and extension/outreach activities. Only by working together in creative new ways will we build upon our extensive accomplishments and fully realize the opportunities that lie ahead of us. I can’t wait to get going on it with you, for our world!

**BENJAMIN Z. HOULTON**

*Ronald P. Lynch Dean  
May 11, 2022*



**OUR OVERARCHING GOAL**

Cornell CALS spearheads the “solutions century” by collaborating with the larger university, our network of partners, and local to global communities to coalesce around the world’s leading challenges.

We’ll connect across all of New York state and the world to enliven our innovation ecosystem, connecting local to global programs in the form of new collaborations and basic discoveries. As we maintain our core work and departmental focal strengths, we’ll prioritize five transdisciplinary moonshots to evolve our programs: redesigning 21st century agri-food systems, pioneering life science breakthroughs, synthetic biology, holistic climate solutions, and a strategic wild card.

We’ll actively translate, share, and scale our transdisciplinary solutions for global application — and bring learnings from abroad back home. By bridging basic and applied perspectives, we will foster opportunities to work on big challenges in an increasingly small and hyperconnected world.



# Transdisciplinary Moonshot Initiatives



## Cohort-based Faculty Hiring

### The Grand Challenge

Creating seeds for transformative change with strategic investment is a familiar concept for Cornell CALS. Many CALS individuals and teams have gained new ground by focusing on a seemingly impossible challenge and achieving impactful results — this is what uniquely separates us from our peer institutions.

The academic landscape has been undergoing dramatic changes in recent years, however, with many new tools, techniques, and technologies pushing on the very notion of academic discipline. The growing desire for researchers to seek new approaches as they embark on solving scientific problems is equally accelerating in the modern academic setting. More projects are finding success through multiple disciplinary convergence. Building on conventional academic departments, cross-college and university projects have revealed connective threads that dissolve traditional academic boundaries and branch out to the world around us.

During the 2021-22 academic year, we organized a highly successful collegewide process to hire a new cohort of scientists who focus on interdisciplinary scholarship and translational research to address systemic challenges facing historically and habitually marginalized and disadvantaged communities. This novel hiring process, focusing more on broader areas of research than specific academic disciplines, yielded a record number of applicants, while several of our academic departments also underwent more traditional faculty hiring processes based in academic departments.

### Primary Objective

CALS will build on the success of the cohort hiring approach and refresh the way we hire new researchers to complement our existing programs and initiatives. Our departments will continue to pursue academic hiring within their disciplines. Our new transdisciplinary moonshot initiatives will grow across our current disciplinary breadth, prioritizing five key research topics to focus our attention and lay the groundwork for new efforts that push the boundaries of what's possible.

Moonshot cohorts will be created via a bottom-up, collaborative proposal structure for each area with central support for activities, engagement, and research. This cooperative approach will break down barriers for departments to assemble teams best equipped for each challenge area, bringing detail and creativity to the moonshots.

To create future faculty lines under this program, CALS will solicit competitive proposals from faculty with the following general criteria:

- 1 /** Describes a research agenda within one of the moonshot areas that draws on at least three academic units or programs.
- 2 /** Includes areas of inquiry spanning both the natural and social sciences.
- 3 /** Includes consideration of potential unintended consequences and externalities to ensure any solutions are more inclusive, equitable, and positive.
- 4 /** Proposes new academic staff hires charged with nonacademic collaborations and new faculty hires.

*Additional details and timelines will be announced in fall 2022.*

1

## Redesigning 21st Century Agri-Food Systems

Nourishing people and planet as interconnected systems that create opportunities for digital agriculture, circularity, markets and economic development, and impactful local solutions from New York agriculture to the world.

2

## Pioneering Life Science Breakthroughs

From biomolecules, genes, and evolution to human behavior, development and communication, species composition, biodiversity conservation and the biosphere.

3

## Leading in Synthetic Biology

Harnessing the power of science and innovation biology to engineer new material solutions, create sustainable technologies for markets, and understand such advances from a societal perspective.

### WHAT IS MOONSHOT THINKING?

Just as most complex problems cannot be solved with the status quo, landing on the moon required a concentrated transdisciplinary approach. We embrace this moonshot thinking concept as the action of solving complex, real-world problems, including those that seem impossible, with big ideas and innovative thinking that spans disciplines as well as new technologies.

5

## Strategic “Wild Card”

In addition to the four core areas, we will solicit bottom-up proposals in new areas not currently identified in the moonshots as hiring priorities for the college.

4

## Accelerating Holistic Climate Solutions

From energy resources, greenhouse gas reductions, carbon capture, and resilience to adaptation, economics, climate justice, and food security.



# Targeted Initiatives

—————>

**2022 —  
2030**

While we unleash the creativity and collective power of transdisciplinary excellence in the college, we also seek to further our commitment to cultivating a nurturing community that embraces **diversity, equity, inclusion, and belonging**, and to bolster our forward-looking and world-leading advancements across **teaching, research, innovation, and extension** programs.

We will lead in the “solutions century” by promoting fundamental scientific discoveries and empowering our innovation ecosystem to effect local to global change, with renewed focus on **collaborative transdisciplinary scholarship**. Our commitment to diversity and inclusion and growing a community of belonging will be the connective tissue in our goal to be the world leader in agricultural, environmental, life, and social sciences in the 21st century.

While we seek to break down systemic barriers to enable a more inclusive environment for all in CALS, we will harness the power of modern science communication to create a society that uses scientific knowledge to make informed decisions. Our overarching goal to **globally collaborate and coalesce around the world’s leading challenges into and beyond 2050** will be bolstered by strategic investments of resources and attention in the next decade.

# Diversity, Equity, and Inclusion

*Ensuring institutional success  
with communitywide support*

## Current Landscape

Our community spoke intentionally about the need for CALS to prioritize resources supporting actionable and measurable forward momentum for our college's diversity, equity, and inclusion goals. This vision also requires a detailed analysis of the structures and culture as well as the continued engagement of all perspectives to foster a place of belonging in CALS. Recognizing that our college is also part of the university's efforts in DEI, we must connect efforts from academic units up through CALS to the broader university. This should be executed in an effective and transparent way that creates maximum impact for historically marginalized, disadvantaged, and underrepresented communities both at Cornell University and within our greater community via our extension programming.

## Strategic Action Plan

For us to fully achieve an equitable future, we will generate specific goals and benchmarks for all future CALS DEI efforts and regularly report our progress to the college community. We also will focus our attention on communities that have been disproportionately negatively affected by the design of our current activities and will develop the goals, benchmarks, processes, environments, and experiences to facilitate that understanding. We will recruit, welcome, and sustain employees and students from diverse backgrounds in an equitable and inclusive manner.

**▲ GOAL** / Develop a comprehensive CALS-wide system for DEI initiatives that effectively link academic department-level efforts and leadership to college- and university-level efforts and leadership.

**▲ GOAL** / Develop a faculty-led effort to examine evaluation options in research, teaching, and extension for tenure, promotion, and reappointment that reward important efforts such as diversity and inclusion, community engagement, and commercialization.

**▲ GOAL** / Create support structures and offer resources to the Inclusive Excellence cohort hire. Also, we will institutionalize hiring practices

and faculty development opportunities for future cohort hires across CALS to build an environment that facilitates recruitment and retention.

**▲ GOAL** / Prioritize a culture of diversity by creating targeted areas of opportunity for increased cultural sharing among faculty, staff, and students, including an expansion of topics and speakers representing diverse cultural viewpoints.

**▲ GOAL** / Establish endowed professorships with a specific focus on working with marginalized communities within agriculture.

# Research

*Creating answers to the world's toughest problems*

## Current Landscape

Cornell CALS has a strong track record in securing extramural research support from federal and state entities. Federal funding agencies are substantially shifting the award criteria to prioritize research and innovation as essential elements behind grant success. There is increased focus on real-world outcomes involving the translation of basic agricultural and life sciences discoveries, including measurable implications in areas such as community engagement, policy creation and execution, intellectual property commercialization, and public-private partnerships.

## Strategic Action Plan

The shift in the funding landscape recognizes the importance of convergence research and transdisciplinary centers, which bring together teams of researchers to tackle salient challenges in society. CALS recognizes these changes in the funding environment and will adapt our grant and innovation support accordingly, along with our need to focus on hiring strategies that position CALS' diverse programs for success.

**▲ GOAL** / Establish a new Office of Research and Innovation in CALS and recruit/hire an associate dean to direct office efforts and create a strategic vision. This office will support grant activity across the college and ensure increased success from grant application efforts, help advance teams created via the transdisciplinary moonshot process, draw connections from local to global efforts throughout the CALS research portfolio, and engage in infrastructure needs to support research and development.

**▲ GOAL** / Increase the submission of large center/institute cross-discipline federal grants from CALS faculty and increase total college annual research expenditures.

**▲ GOAL** / Foster increased research and extension innovation by creating pathways and reducing barriers to establish new

public-private partnerships, increasing research funding from industry, and implementing agile commercialization pathways, including but not limited to connecting with Cornell AgriTech in Geneva, New York, Cornell Tech in New York City, and Ithaca-based revitalization efforts. Educate CALS tenure-track faculty and extension faculty on how to navigate the landscape and create mutually beneficial partnerships with the private sector.

**▲ GOAL** / Establish a formalized process for active sharing, collaboration, and matchmaking between faculty and staff of all CALS departments, and seek opportunities to expand collaboration with other colleges and campuses at Cornell.

# Academics

*Creating a future workforce  
and building global citizens*



## Current Landscape

CALS continues to attract curious, passion-driven students who will work together to ask new questions and discover new answers. In support of Ezra Cornell's vision of "any person ... any study," we are actively facilitating new opportunities for first-generation students and students from historically excluded backgrounds. The complexity of our time requires us to seek new ways of properly preparing students for their future, including through their studies, and increasing their ability to engage in healthy debate and dialogue with others. The global pandemic has increased the urgency around ensuring the mental health of our student body and helping individuals access timely Cornell resources.

## Strategic Action Plan

CALS will inject support into the Office of Academic Programs to collaborate on solutions to academic stressors for students, student-facing staff, and faculty; expand investments in first-year student programming; invest in centralized software to allow students and advisors to track degree progress; and increase support for active and innovative learning initiatives. These efforts will allow CALS to continue to enable our students' further success in their pursuit of academic exploration within a community committed to their personal and professional success.

**▲ GOAL /** Invest in centralized student degree tracking/auditing software, allowing students and their advisors to easily track their degree progress and evaluate decisions about changing majors/adding minors.

**▲ GOAL /** Expand investments in programming for first-year undergraduate students to develop healthy student communities and build a culture focused on belonging and acclimation. Launch the CALS Navigator program, designed to personalize support for underserved and first-generation college families. Programs will be coordinated across the college to ensure the greatest student success.

**▲ GOAL /** Empower undergraduate students to seek experiences outside the classroom, including but not limited to internships, field-based learning, research experiences, and training opportunities. This will involve a robust set of learn-by-doing opportunities through flexible and tailored experiences to teach students how to effectively tackle

interdisciplinary challenges in teams and prepare them for a dynamic professional world.

**▲ GOAL /** Create solutions to resolve systemic academic stressors for students, student-facing staff, and faculty. Consider new models that elevate incentives to learn. Encourage instructor transparency around academic expectations, and improve communication around mental health and wellness, especially in all introductory courses.

**▲ GOAL /** Increase support for active and innovative learning initiatives, including the expansion and continuity of funding for active learning postdocs in existing courses. These programs have substantially improved the specific courses under focus, elevating the student experience, deepening student learning and success, and preserving faculty time. Grow the availability and coordination of engaged, experiential, and entrepreneurial (E3) experiences for CALS students to add life-changing opportunities to their academic journey.

# Extension and Outreach

*Turning knowledge into practice*

## Current Landscape

Our extension and Cornell Cooperative Extension networks are national and international leaders in helping our food and farm community thrive throughout every county in New York state and the boroughs of New York City. Partnerships and collaborations extend our reach throughout the Land-Grant system in the United States. CALS has nearly 100 years of alliances that transcend national borders to support an increasingly connected world and solve stakeholder problems where we find them. Even greater impact is possible when CALS takes scientific knowledge and approaches from New York into the international arena and then applies lessons learned there to our domestic work. A world of global connections necessitates impact on a global scale.

## Strategic Action Plan

We will evaluate processes and procedures through which we can reimagine our local to global connections through extension and coordinate activities for greater impact. We will continue to encourage extension appointments in academic departments and further educate our academic community on opportunities to engage with extension. We aim to inspire a culture through which traditional academic programs connect to extension activities, including the translation of knowledge for societal impact, and which appreciates the “translational ecosystem” under which basic sciences are strengthened through deep commitment to applied solutions and vice versa.

**▲ GOAL** / Launch a global extension team to begin formalizing global and international engagement that connects with NYS Land Grant and domestic activities.

**▲ GOAL** / Organize and coordinate activities with new structures and processes to strengthen Cornell extension and Cornell Cooperative Extension efforts, ensuring new research grants between the Cornell campus and the county CCE offices, and positioning CCE to meet the needs of New Yorkers across the state. Grow CALS programs in New York City and expand expertise in urban agriculture, food systems, and climate resilience.

**▲ GOAL** / Increase funding dedicated to partnerships, especially those that enhance our responsiveness to and inclusion of diverse stakeholders.

**▲ GOAL** / Identify new opportunities for extension appointments, fostering new connections with our academic programs, and expand extension to explicitly include innovation appointments in CALS and CCE, driving toward a model of “discovery engines” for commercialization, public-private partnerships, and regional economic development.

# Fundraising and Communications

*Bolstering resources and our message*

## Current Landscape

Cornell University is leading a \$5 billion fundraising campaign that aims to enhance Cornell's world-class academics, research, and engagement, with a special focus on affordability for under-resourced students. Our challenge is to connect with and inspire current and potential CALS supporters in our mission to create a future world better than the one we inherited.

## Strategic Action Plan

Presenting our news through increased multimedia storytelling and helping academic departments connect to fundraising efforts will broaden our engagement opportunities. By building our financial capacities, we can increase financial aid opportunities for students seeking to afford a CALS education and provide for our faculty and staff as they seek answers to the world's toughest questions.

**▲ GOAL /** Create a strategy for increased coordination among academic departments with the CALS Office of Alumni Affairs and Development to drive fundraising success in the “To Do the Greatest Good” campaign and beyond.

**▲ GOAL /** Develop processes to empower issues-based storytelling for improved fundraising agility and donor engagement. Hire a digital media engagement strategist to increase video storytelling and content creation that will further engage our existing donor base and expand donor engagement opportunities to new audiences.

**▲ GOAL /** Participate with Cornell University initiatives, like the “2030 Project: A Cornell Climate Initiative,” to engage in cross-college and universitywide philanthropy, including joint fundraising with other colleges and units.

**▲ GOAL /** Prioritize fundraising efforts to create endowed professorships for each transdisciplinary moonshot area, as well as funding for such initiatives as faculty support, graduate fellowships, priority projects, student career preparation opportunities, and undergraduate scholarships.

# Thank You

We are especially indebted to the more than **700 CALS community members** and external thought leaders who responded to our fall 2021 call for engagement and feedback on our vision for this plan. Special thanks also to the stakeholder groups, including the CALS Student Advisory Council, as well as Provost Michael Kotlikoff, Vice President for University Relations Joel Malina, and Vice President for Alumni Affairs and Development Fred Van Sickle, who also participated in feedback sessions with us. Thank you to Associate Dean and Chief Communications Officer Samara Sit in her management of our strategic planning process and her partnership with strategic design company IDEO, who helped us hone our vision. The careful analysis of our opportunities and barriers was examined by five faculty/staff/student committees in spring 2022, whose members are listed below.

## **ACADEMIC PROGRAMS & CURRICULUM COMMITTEE**

Toby Ault, Sahara Byrne, Leonardo Campagna, Heather Feaga, Sarah Giroux, Katherine McComas, Zachary Schulman, Jennifer Seavey, Sm Shariar, Tom Silva, Abby Snyder, Ying Sun, Rhonda Todd, Nathalie Trottier, Jamie Vanucchi, Maxine Beata Zaretsky

## **COMMUNICATIONS & FUNDRAISING COMMITTEE**

Christy Agnese, Sharon Detzer, Christopher Haight, Matt Hayes, Holly Heitzman, Bramble Klipple, John McKain, Nicole Rossi, Ann Russ, Samara Sit, Chris Smart, Jenny Stockdale

## **DIVERSITY & INCLUSION COMMITTEE**

Maricelis Acevedo, Diane Bailey, Cedric Feschotte, Chris Fromme, Yolanda Gonzalez, Eduardo González Jr., Ian Hewson, Neil Lewis Jr., Dan Luo, Anna Katharine Mansfield, Corrie Moreau, Angela Odoms-Young, Scott Peters, Kristan Reed, Chelsea Specht, Julie Suarez, Hale Tufan, Ann Vegdahl

## **EXTENSION COMMITTEE**

Alejandro Calixto, Chris Gerling, Yu Jiang, Jenny Kao-Kniffin, Quirine Ketterings, Marianne Krasny, Vanessa Lockel, Jan Nyrop, Judson Reid, Margaret Smith, Lynn Sosnoskie, Julie Suarez, Chris Watkins, Christopher Wolf, Bruno Xavier

## **RESEARCH & INNOVATION COMMITTEE**

Beth Ahner, Sam Alcaine, Esther Angert, Buz Barstow, Sumanta Basu, Josh Cerra, Julio Giordano, Viviana Ruiz Gutierrez, Cathy Kling, Johannes Lehmann, Josephine Martell, Peter Paradise, Sarah Pethybridge, Kelly Robbins, Marcus Smolka, Rich Stedman, Melissa Warden, Xiangtao Xu



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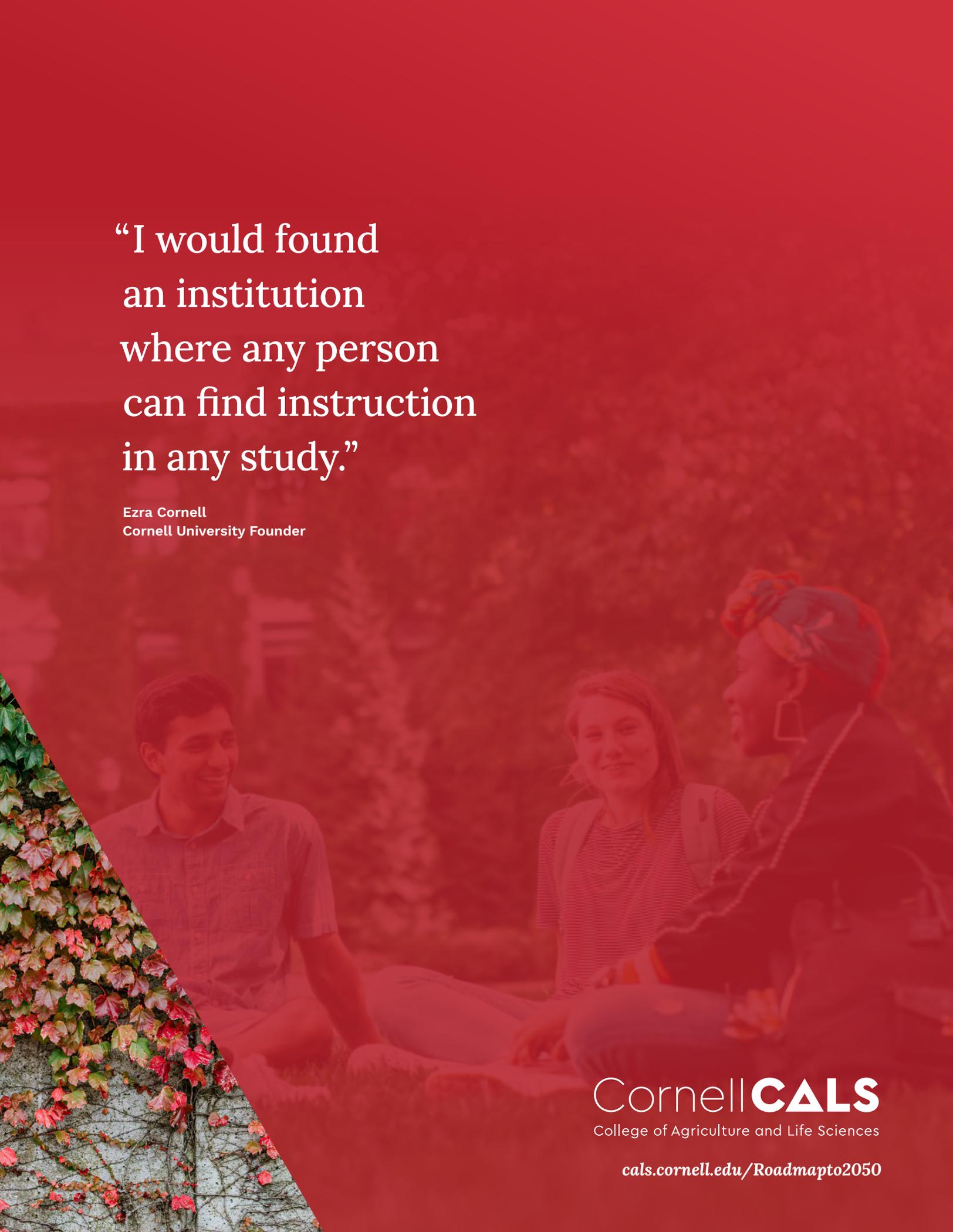
**Progress**

 [cals.cornell.edu/Roadmapto2050](https://cals.cornell.edu/Roadmapto2050)



“I would found  
an institution  
where any person  
can find instruction  
in any study.”

Ezra Cornell  
Cornell University Founder



Cornell **CALS**  
College of Agriculture and Life Sciences

[cals.cornell.edu/Roadmapto2050](https://cals.cornell.edu/Roadmapto2050)