College of Natural Sciences
State of the College Address

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Good afternoon! Thank you for the warm welcome and great spirit of partnership I’ve enjoyed since I became an Austinite and Longhorn a little over a year ago. I’m only sorry that it took me 58 years to find my way here.

And thank you for coming, today. As I’ll discuss more shortly, we – the faculty, staff, students, and other stakeholders of the UT College of Natural Sciences – are partners in an endeavor of enormous importance. So I’m grateful that you’ve joined me for this conversation, in person and online, about where the college stands and where we think it should be headed.

Most importantly, thank you for all you do to lift up research and education in science, mathematics, and computing. Whether:

• you’re tenure-stream faculty, teaching and leading a research group that is truly seeking to change the way the world thinks about deep and vital issues, that’s impact!

• or if you’re a staff member who has impact by ensuring that our doctoral students and postdocs – the eyes and hands of our research – are appointed and paid; labs are built, safe, and functioning well; grant proposals are submitted and administered; and so much more;

• or you’re one of our key instructional faculty, whose impact comes from delivering all-important teaching, creatively challenging the next generation to value and apply the power of reason; [Reason is the idea that binds us, not just across the college but across the entire university and, indeed, across the entire post-Enlightenment world!]

• or you’re one of our students – cherished, whatever your roots, wherever you come from, whoever you are. We welcome you! You belong here! And we are grateful that, because of you, science and mathematics, Carl Sagan’s “Candle in the Dark,” will not only remain aflame, but will burn brighter and brighter, increasingly illuminating the world. That is your impact.

Let me now turn to some unsung heroes. These partners of mine are the folks among us who accept the responsibilities and demands of leadership and who share their remarkable commitment, expertise and passion for the good of our departments, college and campus. They are our associate deans, our college and center directors, our program leaders, those engaging with the public, and, of course, our department chairs and associate chairs. What all these people do really matters for all of us. And while these service roles stretch you, enlighten you, teach you how to see things from multiple perspectives, and give you broad new vistas of the university and of higher education, there’s no doubt that they divert you from your original trajectory. So please join me in putting the lie to that oft-used consolation – “Good administration is met by the deafening applause of silence” – by giving them a big round of applause!

Why am I so grateful to everyone here? Because what we do really matters, perhaps now more than ever. With physicist Richard Feynman, I truly believe that, through the creativity and reason we apply and from the beauty and impact we create, our community is a pivotal part of “the greatest adventure the human mind has ever begun!” So, thank you for all you do to make Texas Science ever more vibrant, exciting, and full of impact!
I want to begin with a story. A year or so ago, I was sitting in the chair of my dentist. It was the end of the workday, and my dentist and I were chatting. He’d just given me a root canal treatment, and both he and I were a little teary-eyed. Why? Not because I was in pain. But because our conversation had led us to the explicit appreciation of how far STEM fields – science, technology, engineering and mathematics – have brought us over the past hundred years, even thirty years. Consider:

- I would depart more comfortable than when I arrived.
- I’d endured essentially no pain during the procedure.
- There’d be almost no chance of infection.
- The work would likely outlive me by decades.
- And we’re where we are because of a remarkable interplay between chemistry, physics, biology, textiles, robotics, materials, engineering, computing and more.

That is impact! And that is what science has delivered, over and over and over again!

This is the first address of this type that I’ve given, but I have sat where you are quite a few times. And typically, I’ve kept rough count of how many times my subfield or department or college was mentioned. Not a strategy I’d recommend! Let me gently dissuade you from doing that. I’m aiming to focus on the things that bring us together:

- excellence and diversity;
- boldness in our educational and research endeavors; and
- a restlessness to discover and make a difference.

From my first day on the job, it’s been astounding to get to know the achievements of this community. Some of this has come through visits to departments, some through promotion dossiers, some through conversations with chairs and others, and some through recognition that has come our way this year.

Perhaps I may highlight just a handful of awards that have recently come to individuals.

- On my first day at UT came the Fields Medal announcement for Alessio Figalli, a mathematician whose core work happened right here in Austin and builds on beautiful questions like: What’s the most efficient way to move iron ore from this set of mines to that set of factories?
- Soon after, there was a Nobel Prize in Medicine or Physiology for three-degree biology alum Jim Allison, now at UT’s MD Anderson Cancer Center for the development of cancer immunotherapy. That’s impact! And it came back-to-back with the 2017 Nobel Prize for three-degree biology alum Michael Young, who was recognized for understanding the genetics of circadian rhythms, the clocks that evolution has given us.
• A couple of days after that came a MacArthur “genius” award for chemistry assistant professor Livia Eberlin, who’s on a path towards revolutionizing cancer surgery with the MasSpec Pen that she and her collaborators have invented.

• In the New Year, we celebrated the King Faisal Award to Al Bard, widely recognized as the world’s greatest living electrochemist.

• And at Spring Break the news came of the Abel Prize, in effect the Nobel Prize of mathematics, for professor emeritus Karen Uhlenbeck. It was in recognition of her beautiful work on the mathematics that governs the shapes of soap films and the gluons (that’s physics-speak for glue) that hold protons and neutrons together. Karen is the first woman in history to win this highest of mathematics awards. And not only did the mathematical world celebrate, so, too, did the Paramount Theater in downtown Austin, which broadcast the news on its cinema awning.

And some of the most prestigious teaching and service awards in Texas and the nation were given to faculty members.

• Uri Treisman won the top mathematics service award from the Mathematical Association of America.

• David Vanden Bout, our senior associate dean and associate dean for undergraduate education, won Global MindED’s 2019 Inclusive Leader Award. And just today we learned that David is the recipient of the President’s Award from The Precursors – the association of alumni who were the first African Americans to attend UT.

• CNS had a clean sweep of the campus with this year’s UT Regents Outstanding Teaching Awards, with chemistry’s David Laude and computer science’s Alison Norman gaining this prestigious recognition.

And if that’s not enough showing off, did you know? Steven Moore, staff director for facilities and safety, went to California this summer and shattered records for his bracket in the Western States Endurance Run – a 100 mile run through mountains – which he completed in only 18 hours, 14 minutes and 57 seconds!

I’m humbled by this community of faculty and staff, and the impact they are having. What good fortune we have to work with this impressive group!

We’ve also had many successes that reflect on work accomplished together. There are too many of these to recount, but they include things like:

• how our advisers and teaching faculty have contributed to Natural Sciences graduation rates climbing steeply, to above 70 percent;

• how college fundraisers helped secure support for UT Austin’s involvement with the largest telescope ever to be built, the Giant Magellan Telescope;
and how our community at the Marine Science Institute worked together to make possible a $5 million Economic Development Administration grant to repair part of the campus damaged in Hurricane Harvey and help establish a new Center for Coastal Ocean Science.

For all your varied contributions to your departments, units, classrooms, college, and university: Thank you!

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This first year has been a lot about learning from those whose experiences with this college eclipse mine. This includes in the processes we have used to identify college priorities.

• I and others in the dean’s office have been visiting departments for formal faculty meetings and also less formal gatherings. We’ve learned about cutting-edge research, as departments took turns introducing the dean’s office team to some of their extraordinary projects.

• I also had the chance to meet with staff: those experiencing the challenges of the transition to WorkDay; those at the Marine Science Institute working to rebuild; and even those who decided on “Staff Celebration Day” here on campus to take me up on an offer to have lunch with the dean.

• I’ve also learned from people like the passionate members of the college’s advisory council and members of our other advisory boards, many of them alumni, who are advocates and ambassadors playing no small part in our successes via their support.

• There were also quite a number of meetings with students: leaders from our graduate and undergraduate populations who wanted to make sure I knew their priorities and about their experiences in CNS.

All of this culminated in a series of discussions and conversations with chairs, unit leaders, and other strategic thinkers among our faculty who worked closely with me to synthesize information and develop a Strategic Framework, to be posted soon, with recommendations to guide the future direction of CNS.

Four core areas for attention emerged for how best to move forward in Natural Sciences:

• with a focus on our people – all of you,

• with a focus on our students,

• with a focus on the impact we have in our research, and

• with a focus on the broader public in Texas and beyond, who are served when we achieve our mission.

I. Let me begin by talking about the first part of our Strategic Framework, 

   Advancing discovery through our human capital: our faculty and staff.

I mentioned some impressive accomplishments by members of our community, not only to give you a sense of the highlights of the past year, but because these accomplishments reverberate to the
benefit of us all. It’s important that we continue, amplify, and systematize our efforts to lift up the accomplishments of the outstanding individuals among us and see them recognized for the impact they have. It takes work, selfless work, so we must ensure it’s valued. The same goes for all forms of service, especially by those who advance diversity, equity, and inclusion.

We must also build a culture where we support one another toward meeting the full potential of our people. Some efforts are already in the works.

- A new early-career faculty development program – Let’s Get Started – has begun, to help tenure-track faculty who recently joined us to come together as a cohort; receive (and give!) mentoring and support; and learn to be leaders engaged in shaping the university. We are equipping them for success – their own and, not independently, the broader community’s.

- We are also pursuing parallel efforts for mid-career faculty, those recently promoted from assistant to associate professors. Our aim is to help them maintain momentum and plan for their next stage. We understand that you have reached a milestone in your career – but it must be one of many! How can we help you continue to grow and develop as a thought-leader and shaper of your field? As a highly stimulating teacher and as a leader in the college, perhaps a future director, chair or dean? How can we support you in taking the high-risk, high-reward chances that may lead to major multi-investigator funding streams, which have the power to transform this institution for years to come and, with them, transform your field of study?

Another critical element is the advancement of staff who, as you know, support everything accomplished here. We’re looking at changes that need to be made in training and in our campus culture that will make a world of difference in the college’s ability to support and retain excellent employees.

II. **The next part of the framework for future success is:**

*Equipping our students for lifelong success and fulfillment.*

At the heart of this is high-quality teaching: delivering classroom instruction that meets the needs of every learner is a non-negotiable requirement. But we have to aim higher than that. We must thrill, inspire, and graduate people who will go out into the world with a robust understanding of what science and mathematics are: how they function; how they have led to astonishing capabilities in the supply of food and medicines, water, power, and transportation, communication, and much more; how they are rooted in creativity and reason; how they are what brought humankind out of caves; and how they are our best bet for ensuring that we don’t have to return to caves.

Why is delivering high-quality teaching non-negotiable? Because UT graduates will be engaged in a world that will be increasingly rooted in technology and increasingly fueled by data. Graduates of our college, and from STEM colleges around the world, will be designing that world.
But, in addition, we shall need the graduates from other colleges – business, liberal arts, education, communications, social work, and more – to engage effectively in the increasingly technological world. If we teach them brilliantly, too, they will be equipped to engage with technical specialists. And – as the thought leaders they will also become – they will be equipped to be clear-headed about the value of science and mathematics, and thus help guide society away from “superstition and darkness” [Carl Sagan] and towards a world in which reason rests securely in its rightful place… and, with it, funding for education and research in science and mathematics.

But our instruction should also thrill and inspire simply because what we create in the College of Natural Sciences, and what we teach, are ideas of great beauty. They are high-water marks of human culture and creativity that stand alongside the sonnets of Shakespeare and the paintings of Picasso. Again to quote Carl Sagan: “Not explaining science seems… perverse. When you’re in love, you want to tell the world.”

So how do we get there? The good news is that we are already heading in the right direction. Increasingly, many of our people are embracing the privilege of guiding the next generation – with great skill, energy, imagination, and success – and with the guidance of the ever-developing field of the scholarship of teaching and learning.

But not all! All of us can teach better. But for those pockets around the college who are failing in this sphere, for those who are ho-hum teachers, we shall be working with you to get you to where you must be.

Teaching quality is like fitness, not height: you can do something about it with care, commitment and an openness to guidance.

But, to continue to fail is to shortchange our students and to steal an unfair advantage (through that extra paper or grant proposal) from your neighbors who are excelling in all dimensions. And that is not the neighborhood we can settle for!

We have, in TIDES, an outstanding resource to support our faculty in delivering the highest quality instruction for students – our majors and our non-majors. TIDES is for all of us – those of us who are already excelling but seeking to do even better, and those who are not yet excelling but, with guidance, will be.

As for our faculty of instruction and faculty of practice, we must ensure that they receive the support, opportunities for advancement, clear pathways for promotion, and resources they need in order to succeed in their vital roles.

Last year saw the launch of our Inventors Program, which provides students with experiential opportunities to learn what it means to be an entrepreneur. We got great guidance and encouragement for this new initiative from members of our Advisory Council and others. And our students have relished the challenges presented to them by the Austin business community and others. I’m sure you’ll be hearing more about this adventure in innovation.
We must continue to match our educational offerings not merely to tradition but to what our fields demand and what STEM best practices demand.

- As we remodel buildings: focusing on active classrooms and opportunities for environments to support the goal of engaging deeply with our students.
- And as we see opportunities to expand into areas that are new to us: such as in the Option III online master’s programs recently launched by Nutritional Sciences and Computer Science.

And, as the world changes, we must change with it – or, better still, anticipate where it is heading. For example:

- Imagine the impact we could have in realms such as quantitative reasoning for all? What if UT led the way for everyone in statistics, data science, mathematics, and computing in rethinking curricula, designing it to nimbly meet the needs of the new century?
- What if we led in quantum education, not just for STEM people but for everyone? It’s been said (only half-jokingly, by former Lockheed-Martin CEO Norman Augustine) that one-third of the US Gross Domestic Product is attributable to quantum mechanics. And that was in 2006! Our graduates will spend their careers in a world in which quantum technologies are likely to become vital, as I discussed with other academic leaders at a recent White House roundtable meeting. So how can we not ensure that all UT graduates depart from the Forty Acres with some appreciation of the quantum world and the astonishing view of nature it demands? Imagine not just a watered-down version of a technical course but a course that brings the quantum world to them in a truly meaningful way.

And as we teach our students, we must be attentive to the learning environment, the atmosphere in the classroom. Are we signaling to our students that we care about them as people? That we want them to succeed and we encourage their goals and dreams? And that we are their partners in their educational adventure?

Data from experts in student mental health and wellbeing unambiguously show that a healthy learning environment has a profoundly positive impact on our students’ well-being in college and success in life. We are all aware of the dramatic increase in stress, anxiety, depression, and more experienced by our students, and the attendant harm and potential for dreadful consequences. I ask that we commit to fostering healthy, nurturing – not coddling! – classroom environments. Over the next few weeks, the college will be providing you with carefully designed, helpful tools to ensure that our classrooms get there.

III. The third part of our framework is all about: Breaking boundaries with our research

We need to get out of our traditional research silos if we are to have even greater impact with the research that we do.
To support this, we shall continue to invest in core facilities and early-phase research, including through partnership with faculty, with other colleges, with the Office of the Vice President for Research, and via matching funds.

Over the past year, CNS has provided more than $1.4 million in contributions or commitments, to:

- The Center for Biomedical Research Support (CBRS),
- The Texas Materials Institute (TMI),
- The NSF MRSEC Center for the Dynamics and Control of Materials,
- High-Performance Mass Spectrometry, and
- High-Resolution X-ray Tomography.

This is on top of our recurring support of:

- The Physics Machine Shop,
- Greenhouses, and
- Catalyst Grants, to help launch early-phase, potentially high-payoff research before it’s credible for federal funding.

And this comes on top of the previous year’s creation of three new facilities in:

- Nuclear Magnetic Resonance,
- The Sauer Structural Biology Cryo-EM and X-ray Facility, and
- our state-of-the-art research greenhouses.

Our Strategic Initiatives Team is also providing important proposal development services, primarily for multi-investigator, center, and training-grant proposals – all areas where we need to be more successful.

I want to talk about a remarkable new opportunity to break research boundaries in the life sciences. It’s possible because of an extraordinary gift to the College of Natural Sciences made by the late Lorraine I. Stengl, M.D. It is a result of her passion for the life sciences, spurred by her interaction with public engagement activities and nurtured over the years by Professor Larry Gilbert – a spectacular example of the impact of public engagement.

In accordance with Dr. Stengl’s wishes, set forth in her endowment agreement before she died, aged 99, the details of how the Stengl-Wyer Endowment will forever more support the highest-level research and education on the diversity of life and organisms in their natural environments are currently being finalized by an outstanding faculty committee: Nancy Moran, Jeff Barrick and Harold Zakon. It will likely include an inspiring mix of support for biological field stations and collections; undergraduate, graduate, and postdoctoral researchers; core facilities; and seed grants to launch high-risk/high-reward projects. It will be competitive – only the most worthy activities will receive support. I am very grateful to this committee for designing this initiative to ensure that it will suitably honor the memory of Dr. Stengl by fueling extraordinary impact. More details to come early this semester.
Which brings me to the theme of development. Building meaningful relationships that may result in philanthropy is a core part of our work. Success with it will ensure that we can capitalize fully on the potential of our students; contribute to transformations in healthcare; ensure a vibrant Texas and beyond; and enable the world-class faculty that we are so fortunate to have not only to shoot for the stars but to reach them. Our development team is really humming – their results for the past year make this clear – though I promise you we’re not going to let up.

Another example of breaking boundaries – really breaking boundaries – involves creating what I like to call thematic research neighborhoods. These are faculty research groups collocated according to profound, long-term research challenges like reducing health disparities or harnessing the power of the quantum, regardless of academic department.

For example, as we invest in the search for life elsewhere in the cosmos and the planets that might host it, we will need to bring together astronomers, planetary and space scientists and engineers, microbiologists, chemists, data scientists, and others. Imagine a research village comprising such expertise and its impact on the students and postdocs, faculty and visitors, prospective researchers, curious philanthropists, foundations, and others. And imagine the impact of collaborating across traditional boundaries and developing utterly compelling interdisciplinary research and grant proposals.

These are the kinds of groupings we should aim for. And it shouldn’t be too hard to do. After all, no longer is any building in our college home to just one single discipline.

Welch Hall, for example, used to be known as the Chemistry Building, though today our chemists are in this building and many others. When Welch reopens, next year, after a magnificent remodeling, it will be home to chemists and many molecular biosciences faculty, biophysicists, and our entire Statistics and Data Science Department.

Our aim is to incorporate this thematic research neighborhood model throughout Natural Sciences and even beyond.

Provost McInnis’s exciting Cluster Hiring program is a very helpful key as we work to break through boundaries. Computer Science and Human Development & Family Sciences are partners in three clusters that will be allocated new CNS faculty positions. Our roboticists successfully argued for another cluster (in which hiring is already underway). And we’re currently working with various colleges and the Provost to find collaborative paths towards four more clusters, loosely speaking in: immunology and infectious disease; planetary habitability; artificial intelligence; and quantum science and engineering. No promises, but we are working towards finding a path.

Breaking through barriers lies at the heart of our commitment to partnering ever more effectively with the Dell Medical School. Transforming healthcare is an essential campus-wide initiative, and we must do our part. This is true in the basic science that we do but also in hiring researchers dedicated to translation, creating authentic impact in healthcare out of the promise of basic science.
And to begin connecting across the campus, we have held several Cross-Cutting Conversations, so far with Dell Med on health themes, and soon with the Moody School of Communications on science communication.

Undergraduate barriers are also coming down. Witness our new bachelor’s degree in Computer Science and Business, which is attracting truly extraordinary students even in this, its first year.

There is also a model for cross-university success to be found in the new and thrilling Robotics Consortium. The Anna Hiss Gymnasium is currently under renovation, and Army Futures Command is partnering with us to blend together computer science and engineering in a spectacular new space there, purpose-built for robotics.

Finally, because graduate students and postdocs are at the heart of almost every successful research group, because they can be such powerful vectors conveying the Texas story around the world, and because they can be some of the greatest sources of boundary-breaking thinking and collaborations, increasing support for graduate students and postdocs is one of our central priorities. We have in mind both the development of philanthropy to create in-perpetuity programs and also a more aggressive seeking of multi-investigator federal grants. Coupled to this must be more determined, more ambitious recruitment efforts to make sure that we really do have the very best students and postdocs – and in numbers that will truly amplify our impact.

IV. Fourth and finally, we must:

**Anchor our efforts to the public we serve through the education and research of this public university.**

I have talked about the opportunity we have – through teaching brilliantly – to send UT graduates out into the world carrying with them an appreciation for science and mathematics and an understanding of how they work.

We must also build appreciation for science and mathematics by connecting directly with our alumni and the broader public, in Austin and throughout the state, as we already do so well at the McDonald Observatory in West Texas and at our Marine Science Institute on the Gulf Coast.

We shall be working over the forthcoming year to get a clearer picture of ongoing STEM outreach efforts from CNS and elsewhere on campus; to establish a more coordinated approach; to partner better with other colleges; to ensure equitable access; and to increase participation. Why reach a hundred people when we could reach a thousand? What could we do with the Texas Memorial Museum? Could we turn the beautiful UT campus into an Austin destination, a cultural mecca for people of all ages interested in STEM themes? I invite you to join me in this vital work.

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Science is international and diverse. The majority of our students identify with a community of color, and the majority of our students are women. Diversity and inclusion are core to who we are at this
university, as scientists, and as residents of the multicultural and dynamic state of Texas. Providing a welcoming, inclusive environment for all is the right way to achieve the work we need to do together.

As you came in, today, and elsewhere throughout CNS buildings, you have seen elements of our WorldChangers campaign to celebrate scientists and mathematicians, from within our community and beyond, who may not reflect the demographic typically associated with “science” in popular culture but who are doing and have done outstanding work.

Today, I am going to ask you to commit to taking at least one action each month to help us be a community where students, faculty, and staff, regardless of their background or identity, can feel they belong here and are appreciated for the diversity they bring.

I commend the work being done by many involved staff, faculty, and students to pull together a new set of “Monthly Ideas for Action” to help us promote this spirit of inclusive community. You will find these monthly actions on our website at cns.utexas.edu/diversity

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I’ll conclude by saying that as we work together to carry out this strategic framework, I see my role as like that of the conductor of a grand symphony orchestra, populated by passionate, accomplished, imaginative musicians. My role is to set the atmosphere, the tone, the pace – to identify possibilities that transcend the individual, so that all these elements come together. And, collectively, we can soar beyond our individual capabilities and create something of powerful, lasting impact. And we will do this because of our:

• outstanding faculty and staff
• our ambitious, boundary-breaking research initiatives
• our students, training for a lifetime of discovery and innovation to change the world, and
• our dedicated, engaged stakeholders from beyond the boundaries of our campus.

You are a part of this symphony – a critical part. I value and need your partnership as we strive to meet our goals. I warmly invite your questions.