

## **The Georgia Institute of Technology College of Sciences Plans for a Strategic Plan (August 2014)**

During the fall of 2014, the College of Sciences will develop a comprehensive strategic plan laying out the College's core goals for the period 2015-2018 as well as the routes the College will take to achieve these goals. The present document is intended to give a preliminary account of these goals and routes.

The College of Sciences is home to seven disciplinary units – the Schools of Applied Physiology; Biology; Chemistry and Biochemistry; Earth and Atmospheric Sciences; Mathematics; Physics; and Psychology – and a STEM education research unit, the Center for Education Integrating Science, Mathematics, and Computing. The College management team consists of some twenty people who lead and provide services for the units within the College: a dean, two associate deans and an assistant dean, and seven directors (of administration and human resources, communications, development, diversity, facilities, finance, and information technology), together with their staff. Some 205 professors, 31 academic professionals, 185 postdoctoral and other research scientists, 1,000 undergraduate students, 845 graduate students, and 149 staff constitute the people of the College of Sciences. All contribute in essential ways so that the College can fulfill its teaching, research, and service missions.

**Mission:** The mission of the College of Sciences is to advance the Georgia Institute of Technology by defining, creating, delivering, and continually renewing outstanding programs of education, research, and community engagement in the sciences and mathematics. As well as providing the foundations for education and innovation in engineering, technology, computing, and medicine, these programs shall seek to reveal and comprehend new knowledge as part of humankind's quest to advance our understanding of the universe and the world we live in.

**Goal 1: Transforming Interest into Lifelong Passion** – The educational programs that we deliver shall strive to capitalize on the exceptional student pool that Georgia Tech attracts, by stretching minds and training rigorous thinking. We shall do this within the setting of science and mathematics, viewed as high watermarks of human thought and discovery that are also of central importance in our increasingly technological world. Our programs shall be well conceived, supportive, nurturing, student centered, and mastery oriented, and be rooted in state-of-the-art educational practices. They shall be delivered superbly and also dynamically and engagingly – aiming to intensify student interest in mathematics and the sciences and transform them into lifelong passions – as we partner with our students in building the foundational elements of their education, regardless of their ultimate career destinations. Of value to society, in view of the adaptability they bring to the technical careers that many of our students will lead, our programs shall also invite the personal enrichment of passions held and help broaden public commitment to mathematics and the sciences. We shall amplify our efforts to recruit more and even stronger aspiring science and mathematics undergraduates to Georgia Tech, by harnessing the recruiting capabilities of our community engagement activities and by partnering with the Office of Admissions in bringing regional, national, and international awareness of the College's strengths and capabilities.

**Goal 2: Enhancing the Research Ecosystem** – The faculty members in the College of Sciences shall strive to create important new knowledge through the research they undertake – primarily in collaboration with their graduate and undergraduate students, postdoctoral fellows, and research scientists and, increasingly, via partnerships with faculty colleagues and their research groups at Georgia Tech and elsewhere. Along with the knowledge thus created, the quality of the training of future generations of researchers, which takes place via the conduct of research, is a core contributor to the reputations of our Schools. It is thus crucial for the College to focus on the research activities of our faculty, in partnership with Georgia Tech

leadership, and to support the research enterprise by providing high-caliber laboratories, equipment, infrastructure, and administrative support. To enhance the research ecosystem and the graduate and postdoctoral programs that power it, we shall: (i) Promote multidisciplinary through the formation of thematic research neighborhoods and interdisciplinary research centers, and diversify activity towards areas that have growth potential and mesh well with Georgia Tech capabilities and ambitions; (ii) Strengthen research in the life and health sciences, including neuroscience and other fields that complement Georgia Tech capabilities in applications-oriented fields; (iii) Enhance our research programs and the visibility and reputation of Georgia Tech by growing doctoral and postdoctoral programs via scholarships and fellowships; (iv) Increase our focus on extra-murally funded multi-investigator and training programs, rewarding faculty who build such programs; (v) Promote efficiency and collaboration through investment in shared experimental infrastructure and high-performance computing facilities, and (vi) Work to identify and build research partnerships with regional institutions.

**Goal 3: Developing and Recognizing Faculty, Staff, and Administrative Excellence** – Faculty and staff in the College of Sciences are expected not only to excel but also to actively seek to improve performance. For faculty, the three spheres of teaching, research and service are all essential. To promote excellence, the College will develop programs for mentoring, guiding, and reviewing faculty and staff performance. These shall include: (i) Early career guidance, with a commitment to fostering work-life balance; (ii) The promotion of excellence and experimentation in teaching, via programs of instruction, discussion, feedback, and review that harness the skills of experienced, successful teachers; and (iii) The creation of a college-wide community of academic professionals whose responsibilities are concentrated on introductory education, who will identify and implement best teaching practices and help instill these ideas throughout the wider College community. We shall also focus on developing new generations of leaders by identifying promising candidates fairly early in their careers, finding roles in which they can gain experience and confidence, and encouraging them to participate in leadership preparation activities. The College recognizes that our staff members are pivotal assets whose effort, ingenuity, and dedication are essential to our success. We shall work with our staff to identify opportunities for professional development and map out attractive career trajectories, and shall enable the strongest performers to take on greater and more challenging work responsibilities. We shall, in addition, relentlessly pursue administrative efficiency and effectiveness, encouraging all members of the College to identify ways to streamline the business we conduct. We shall ensure that our faculty, students, staff, and alumni are recognized for their accomplishments. In concert with this, we shall compete vigorously in the marketplace of visibility to communicate our successes. The relationship between the College and its Schools is one of partnership and collegiality, and we shall strive to sustain this relationship.

**Goal 4: Diversity, Equity, and Inclusiveness** – The College is committed to these issues in their broadest senses and, consequently, they will feature prominently in our thinking and our actions as we strive to promote a respectful, accepting climate that embraces and celebrates diversity. Beginning with the hiring process, we shall promote fairness by implementing bias awareness training for all committees charged with searching for new faculty or staff, and we shall accelerate our efforts to secure new faculty positions for members of underrepresented groups. Continuing on to career development, we shall launch a new Diversity Council, consisting of representatives from all College units. As well as overseeing College diversity, equity, and inclusiveness, the council will identify several themes, each year, in which the College should make progress and will develop ideas for creating that progress. In the research and education spheres, we shall foster the formation of vertically integrated cohorts of underrepresented

groups, from undergraduate students to faculty and staff, so as to enhance the effectiveness of mentoring and role models. We shall also accelerate our efforts to forge meaningful, effective relationships of mutual benefit involving students, staff, and faculty colleagues at institutions such as Spelman College, Morehouse College, and Clark-Atlanta University, especially with a view to fostering long-term research and teaching collaborations and access to cutting-edge facilities.

**Goal 5: Showcasing Science and Mathematics Within and Beyond Georgia Tech** – With the ever-increasing meshing of everyday life and the technological world, we are witnessing an intensifying appreciation of the science that not only enables, e.g., our smartphones, GPS devices, MRI scanners, and new pharmaceuticals, but will also provide the essential new knowledge to fuel the technological revolutions of the future. But we believe that – whether they enable us in our daily lives or do no more than enrich our spirits – the best of science and mathematics should be appreciated as pinnacles of human creativity. We therefore regard it as our duty to bring such ideas to the public, who invest in science and mathematics. The College of Sciences cannot wait for the world to ask: What does Georgia Tech think? We must go out and tell them. (i) Thus we shall develop programs of lectures for the broader campus, presenting themes from the current research frontier as well as stories of the science that is already transforming our lives. (ii) We shall amplify our efforts to provide lecture and discussion-panel programming for the Atlanta community (including Georgia Tech alumni and friends), portraying our results, our aspirations, and our approaches to solving complex problems. Tapping into societal excitement – including via events such as the annual Atlanta Science Festival and Maker Faire – should also broaden public commitment to Georgia Tech and enhance our efforts to recruit outstanding undergraduates. (iii) An exploratory idea of ours is to build a dedicated venue on the Georgia Tech campus – our own version of an exploration center – to provide the public of all ages with hand-on experiences that showcase the best of Georgia Tech science and technology. We shall also strengthen our program of STEM education research dedicated to ensuring that K-12 students in Georgia receive the best possible preparation in science, technology, engineering, and mathematics (STEM), especially those who are underrepresented in STEM education. We shall accomplish this via the Center for Education Integrating Science, Mathematics and Computing (CEISMC) as well as through collaborations within Georgia Tech and with school systems across Georgia.

**Goal 6: Development, Alumni Relations, and Communications, and What We Can Accomplish via Them** – To secure the future of the College, we must strive to complement the support we gratefully receive from the State with private support from individuals, foundations, and corporations. To achieve this, we shall reach out to alumni, friends, and other members of the community, engaging faculty and students in this enterprise, and creating ambitious programs that promote excitement about the College. Resources developed by means of these efforts will provide us with the ability to meet critical needs, such as: (i) Named chairs and professorships to attract, nurture, support, recognize, and retain exceptional faculty; (ii) Merit-based scholarships for undergraduate and graduate students to empower our educational programs in the competition to recruit outstanding applicants; (iii) Postdoctoral fellowships to attract the most imaginative and promising new PhDs, especially in mathematics and physics; (iv) Advanced facilities and equipment to enhance our research capabilities; and (v) Resources to alleviate the “bootstrap problem,” viz., how to support exciting but intellectually risky ideas at launch stage. The College will continue to invest in a communications program to convey to various audiences messages about the quality and promise of its Schools and programs. We seek to further define and reinforce an identity for the College of Sciences both within Georgia Tech and across our various external constituencies.