



Since its founding in 1864, Columbia Engineering, The Fu Foundation School of Engineering and Applied Science, has been a school responding to the needs of and for society and pushing disciplinary frontiers. Today, Columbia Engineering is among the top undergraduate and graduate schools, nationally and globally, and our faculty remains at the forefront of translating technological innovations into real-world impact.



**DEAN MARY C. BOYCE**

As Dean of Columbia Engineering and Morris A. and Alma Schapiro Professor, Mary C. Boyce leads the education and research mission of the School. She has significantly expanded the faculty, funding for faculty and students, cross-disciplinary research, and programming around entrepreneurship and design,

and has initiated a robust set of extensive renovations. Dean Boyce earned her BS degree from Virginia Tech and her MS and PhD degrees from MIT. Her honors include election to the American Academy of Arts and Science and the National Academy of Engineering.

**STRATEGIC VISION**

Launched in spring 2017, *Columbia Engineering for Humanity* encompasses areas of research and education in which our community is truly bringing an engineering impact to a sustainable, healthy, secure, connected, and creative humanity. To achieve this vision, we have

forged an ecosystem that attracts the greatest minds and provides the resources, facilities, and programs that will accelerate discovery and translation.



**THE SCHOOL**

- #1 graduate engineering school in the Ivy League
- #11 in graduate engineering programs nationwide
- #1 in online graduate engineering degree programs
- #3 university for undergraduates (*U.S. News & World Report*)
- 9 departments:
  - Applied Physics and Applied Mathematics
  - Earth and Environmental Engineering
  - Biomedical Engineering
  - Electrical Engineering
  - Chemical Engineering
  - Industrial Engineering and Operations Research
  - Civil Engineering and Engineering Mechanics
  - Mechanical Engineering
  - Computer Science
- Joint programs with Medicine, Science, Policy, Statistics, Journalism, and Business
- Cross-disciplinary research: Data Science Institute, The Earth Institute, Columbia Nano Initiative, Precision Medicine Initiative, Zuckerman Mind Brain Behavior Institute
- Industry engagement
  - Research sponsors > 60 companies
  - Affiliates > 20 industry members
  - Customized executive training
  - Student internships and projects
- Entrepreneurship and innovation
  - Venture competitions, workshops, incubators
  - 30+ startups launched in last 5 years

**FACULTY**

- 230 faculty members
- 100+ hired in last 6 years
- 30 National Academy of Engineering, Science, Medicine, Inventors, and American Academy of Arts and Sciences members
- 27 NSF CAREER Awards in past 5 years

**STUDENTS**

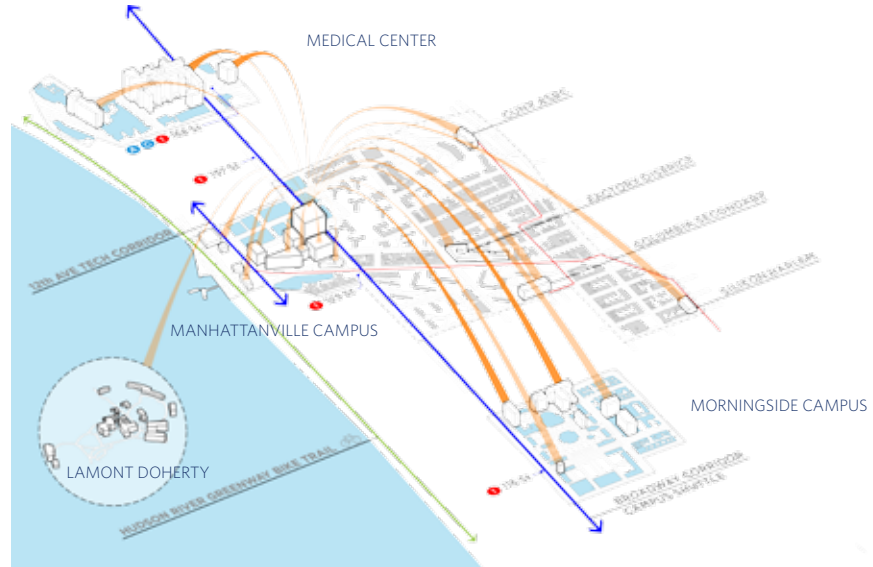
- 1,600 undergraduates
  - 2019 incoming class: 50% women
- Graduate students
  - 1,500 incoming MS students
  - >750 PhD students

# Columbia Engineering and Columbia University: Building an Innovation Ecosystem along an Integrated Research Spine

## AN INTEGRATED RESEARCH SPINE

We are building an integrated research spine in upper Manhattan—a vibrant, collaborative ecosystem that brings together a dense cluster of academic and translational research capabilities.

- >17 Columbia schools and institutes: Columbia Engineering, Columbia Business School, Columbia University Irving Medical Center, Arts and Sciences, Journalism, Social Work, Policy, Zuckerman Mind Brain Behavior Institute, Data Science Institute, The Earth Institute, Irving Institute for Cancer Dynamics
- Initiatives and centers: Columbia Electrochemical Energy Center, Columbia-IBM Center for Blockchain and Data Transparency, NSF COSMOS National Testbed for 5G and next-generation wireless technology (with Rutgers, NYU, and New York City), Center for Fintech, AI, and Business Analytics; Engineering and Medicine Initiative; AI and Robotics; Quantum Initiative; Computational Science and Engineering; Real Estate Tech
- Columbia Nano Initiative:
  - NSF MRSEC: Center for Precision Assembly of Superstratic and Superatomic Solids
  - DOE Energy Frontier Research Center: Programmable Quantum Materials
  - Columbia-Flatiron-Max Planck Center for Nonequilibrium Quantum Phenomena
- External partners: Alexandria LaunchLabs @ Columbia, Harlem Biospace, CCNY Grove School of Engineering, CUNY Advanced Science Research Center, NewYork-Presbyterian Hospital, the New York Structural Biology Center
- Industry partnerships: 70+ companies sponsor research through grants and gifts or participate as an affiliate; joint medical imaging research lab with GE
- Many faculty conduct research at the Medical Center campus and at Zuckerman Mind Brain Behavior Institute



Engineering footprint includes spaces and labs on all three campuses.

## INNOVATION AND ENTREPRENEURSHIP

We have integrated design, innovation, training, and entrepreneurship throughout our School. Through SEAS Entrepreneurship, Columbia Entrepreneurship, Columbia Technology Ventures (CTV), and the Columbia Startup Lab, faculty and students take innovation from the lab to the market with the support of a Makerspace, shared labs, incubators, accelerators, ignition grants, fellowships, and city and state partnerships.

- Venture competitions, hackathons, design challenges, workshops, boot camps
- Columbia Lab-to-Market (L2M) Accelerator Network with New York City and New York State partnerships: NYC Media Lab, RLab (XR), Cyber NYC, PowerBridge NY, BioMed X, LifeSci NYC, blockchain with IBM
- 30+ research-based startups launched in last 5 years

## RICH FACULTY EXCHANGE AND STUDENT INTERNSHIP PROGRAMS

We have established a number of exchanges with top-tier companies and organizations to conduct research, commercialize new ideas, and provide education and training to industry and government employees.

- Internships for undergraduate/MS/PhD students
- Faculty sabbatical or leave at Google, Amazon, Facebook, Microsoft, IBM Research, Adobe, Cisco, Dropbox, Netflix,

Qualcomm, Bloomberg, Microsoft Research, Unilever, General Motors, 23andMe, Spotify, the United Nations Development Program

- Joint appointments with Brookhaven National Laboratory, the New York Structural Biology Center, the New York Genome Center
- Company employees teach or study at Columbia
- Customized education programs

## PREPARING THE WORKFORCE OF THE FUTURE

We partner directly with companies and government to develop custom educational programs, delivered in person, online, or in a hybrid format. Through Columbia Video Network, the online and executive education arm of Columbia Engineering, we offer a wide array of degree and certificate programs, as well as executive education courses and skills-based boot camps across all disciplines of engineering and applied sciences:

- 12 MS programs, including two programs with Columbia Business School
- 20 certificate programs
- Part-time and full-time boot camps, including coding (full-stack web development), data analytics, cyber security, fintech, and digital marketing
- MOOCs, SPOCs, Professional Certificates, and MicroMasters on MOOC platforms such as EdX and Coursera



See how we are Engineering for Humanity at [engineering.columbia.edu/humanity](http://engineering.columbia.edu/humanity)