WHO WE ARE | A MESSAGE FROM OUR EXECUTIVE DIRECTOR

The USC Stevens Center for Innovation is the technology transfer office for the University of Southern California. We facilitate the transfer of research, enabling inventors and companies to benefit society through products that develop from university innovations.

“Innovation is a core part of USC’s culture, and we are proud to be an integral part of this entrepreneurial environment.”

USC Stevens takes a flexible approach to working with both USC inventors and industry partners to evaluate, protect and commercialize USC technologies. We also take a creative approach in the structuring of collaborations. We have recruited senior talent experienced at evaluating technology innovations for commercial potential across various industry sectors, formulating partnering strategies for external industry collaborations, and supporting entrepreneurial programs for students and faculty. Collectively, the senior management team has more than 35 years of experience working in the private sector and more than 50 years of experience working for academic/research institutions.

USC Stevens manages university-owned IP stemming from nearly $700 million in annual research funding, in all areas of the university, including medicine, engineering, sciences and the arts.

Innovation is a core part of USC’s culture, and we are proud to be an integral part of this entrepreneurial environment.

Jennifer L. Dyer, CLP
Executive Director,
USC Stevens Center for Innovation
WHO WE ARE | USC’S TECHNOLOGY COMMERCIALIZATION OFFICE

Our mission is to maximize the translation of USC research into products for public benefit through licenses, collaborations and the promotion of entrepreneurship and innovation.

WHO WE ARE | SUPPORTING USC RESEARCH

USC is rapidly expanding its research activity through a strategy that emphasizes collaboration across multiple disciplines to meet societal needs. The USC Stevens Center for Innovation is part of this strategy and supports our students and faculty to enable the translation of inventions and discoveries into practice, so that we are not only at the forefront of creative research, but also make a meaningful contribution to the health and welfare of society.

USC Research Distinctions:

- Convergence of disciplines to address societal challenges such as cancer, aging, dementia, homelessness and cybersecurity
- Global center for arts, technology and international business
- One of the largest computer science research programs of all American universities
- Largest graduate program in engineering, science and health of all research universities in America
- #1 ranked game design program and School of Cinematic Arts
- #14 worldwide in Thomson Reuters ranking of innovative universities
In 2004, renowned entrepreneur and venture capitalist Mark Stevens (USC Trustee, USC ’81, MS ’84), with his wife Mary, gave $22 million to the USC Viterbi School of Engineering to establish the Mark and Mary Stevens Institute for Technology Commercialization. This gift created an institute to facilitate the commercialization of technologies stemming from USC research within USC Viterbi School of Engineering. In 2007, the office was renamed to USC Stevens Center for Innovation to reflect a broader focus across all academic disciplines and to be the central resource for managing university-owned intellectual property. Today, the USC Stevens Center for Innovation integrates USC’s intellectual property management and licensing functions with entrepreneurial outreach programs and events designed to stimulate innovation across the university and beyond.

“I wanted to give back to my alma mater in a way that leveraged my interests and experience by creating a centralized innovation center that is integrated across USC. This center is structured to facilitate collaborations and the commercialization of USC research for the benefit of society.”

Mark Stevens is one of Silicon Valley’s most successful venture capitalists and a longtime USC benefactor supporting innovation at USC. He has served as a member of the USC Board of Trustees since 2001, co-chairs the Board’s investment committee and is chair of the Board of Councilors for the USC Stevens Center for Innovation. Stevens is managing partner of S-Cubed Capital and a special limited partner and former managing partner of Sequoia Capital. He holds a Bachelor of Science in Electrical Engineering, a Bachelor of Arts in Economics and a Master of Science in Computer Engineering, all from USC, and an MBA from Harvard University. Mary Stevens is a veteran of the commercial real estate brokerage business, including serving as the vice president at Cornish & Carey Commercial in Santa Clara. In 2016, Mark and Mary Stevens were each awarded Honorary Doctorates of Humane Letters from USC in recognition of their contributions to the university community.
Techme Commercialization & New Ventures

USC Stevens strives to identify qualified business partners with the expertise, commitment and resources to commercialize university technologies. To find solutions for your business and technology needs, please search our available technologies at http://usc.flintbox.com. We encourage you to contact a member of the Technology Commercialization team who can guide you through the process of identifying and licensing technologies based on the needs of your business.

USC researchers disclose their scientific discoveries and inventions through the online USC Stevens invention disclosure portal at http://stevens.usc.edu/researchers/commercialization-process. This initiates the commercialization process, which begins with evaluation for patentability, and progresses through the marketing and license negotiation cycle, leading to development and commercialization by a company.

1. USC Scientific Discovery
2. Invention Disclosure to USC Stevens
3. Evaluation
4. Patent Filing
5. Marketing to Potential Partners
6. Agreement Negotiation
7. License to Company or USC Startup
8. Development & Commercialization by Licensee
9. Product Sales, Technology Impact & Royalty Income
The Argus II Retinal Prosthesis system is the first FDA-approved implanted electronic device to re-establish some functional vision in blind patients.

The innovation was co-invented and co-developed by USC inventor Dr. Mark Humayun with the company Second Sight Medical Products, Inc., which manufactured the innovation. It is the result of a close collaboration led by Dr. Humayun of the Keck School of Medicine of USC, the USC Roski Eye Institute and the USC Viterbi School of Engineering. The USC Stevens Center for Innovation completed an exclusive patent license agreement for USC’s contributions to the technology with Second Sight to assist with commercializing the technology outside of the university.

The system includes a small video camera mounted on a pair of eyeglasses, a video processing unit that transforms images from the camera into wirelessly-transmitted electronic signals, and an implanted retinal prosthesis (artificial retina) to stimulate visual neurons.

The system affords previously-blind patients the ability to perceive images and movement.
Dr. Mark E. Thompson with his collaborators at USC and Princeton University developed organic light-emitting diode (OLED) technology that Universal Display Corporation (UDC) has advanced and commercialized into an international business. This disruptive technology can be found in a number of bright, beautiful, thin displays, from Samsung’s Galaxy smartphones to LG’s OLED TVs.

An OLED can be manufactured using a variety of substrates, including glass, plastic or metal. It consists of several layers of organic materials sandwiched between two electrodes. As a result of the decay of the excited state, radiation is emitted that can be seen by the human eye. In active matrix OLED displays, such as the ones Samsung uses in its smartphones, colors are created by independently addressing red, green, and blue OLEDs within each pixel. As a result, OLEDs have a true contrast ratio, deep color saturation and wide color gamut and when manufactured on plastic, OLEDs can be rollable, foldable, bendable and conformable. OLED technology enables display and lighting makers the ability to dramatically alter the consumer and illumination landscape with differentiated, high-performing, energy-efficient, innovative products.

The USC Stevens Center for Innovation signed a patent license with Universal Display Corporation for this suite of technology that now includes over 120 issued U.S. patents.

Dr. Thompson holds the Ray R. Irani Chairman of Occidental Petroleum Corporation Chair in Chemistry and is a Professor of Chemistry at the USC Dana & David Dornsife College of Letters, Arts and Sciences and Professor of Materials Science and Chemical Engineering in the Mork Family Department of Chemical Engineering and Materials Science.
LICENSING | SUCCESS HIGHLIGHTS

Polyethylene Technology for Artificial Human Joints
Extremely wear-resistant materials for total hip replacements

Dr. Ronald Salovey of the USC Viterbi School of Engineering developed high-performing and long-lasting crosslinked polyethylene technology for artificial human joints. The technology was licensed to a major orthopedics company, which uses it in two of its hip prosthetics. The technology consists of advanced polymer materials that improve hip reconstruction for patients, providing an orthopedic structure that is more wear resistant without compromising mechanical integrity over traditional materials.

The company’s product was the first ever FDA-cleared cross-linked polyethylene in orthopedics, and is superior to conventional polyethylene, as it reduces the need for revision due to wear related issues.
LICENSING | SUCCESS HIGHLIGHTS

Bravemind
Virtual reality software to treat posttraumatic stress disorder

Bravemind is a clinical, interactive, virtual reality (VR) based exposure therapy tool being used to assess and treat posttraumatic stress disorder (PTSD). The assessment and treatment of PTSD is a major concern to the military because stressful experiences in today’s war-fighting environments have resulted in a significant number of soldiers returning from deployment being at risk for developing PTSD. The Bravemind VR Exposure Therapy software was created at the University of Southern California Institute for Creative Technologies by Dr. Albert “Skip” Rizzo, Director for Medical Virtual Reality at ICT and Research Professor in the USC Davis School of Gerontology and USC Keck School of Medicine Department of Psychiatry & Behavioral Sciences and Computer Scientist Arno Hartholt, who heads up the Integrated Virtual Humans and Art Production Group.

USC Stevens Center for Innovation has completed licenses for Bravemind to be used by several universities and hospitals, as well as private companies. This has helped to facilitate Bravemind’s dissemination, in addition to Dr. Rizzo’s research and testing over the last 12 years. Also, the software is available free of charge for non-commercial clinical use.

An individual tries out Bravemind, a virtual reality exposure therapy program that is being used to treat posttraumatic stress disorder (USC image by Gus Ruelas).
Dr. Paul Debevec and collaborators from the USC Institute for Creative Technologies and USC Viterbi School of Engineering created the Light Stages to make believable digital doubles for movies, television, video games and immersive simulations by capturing and simulating how objects and people reflect any possible lighting. The Light Stages have been used to create photo-real digital actors in films such as Spider-Man 2, The Curious Case of Benjamin Button, Avatar, The Avengers, Maleficent, Furious 7, and The Jungle Book. In 2014, Debevec and his lab members built and transported a mobile Light Stage system to The White House to scan President Barack Obama for a Smithsonian Institution-led project to create a 3-D Presidential portrait, the first such model created of a head of state.

Through the USC Stevens Center for Innovation, the Light Stage technologies were licensed to OTOY, a Burbank-based company that offers commercial scanning services to the motion picture and interactive entertainment industries.

Based on original research led by Dr. Debevec and published at the 2000 SIGGRAPH conference, the Light Stage systems efficiently capture how an actor’s face appears when lit from every possible lighting direction. From this captured imagery, specialized algorithms create realistic virtual renditions of the actor in the illumination of any location or set, faithfully reproducing the color, texture, shine, shading and translucency of the actor’s skin at a resolution better than a tenth of a millimeter.

The Light Stage technology helped films including Spider-Man 2, The Curious Case of Benjamin Button, and Avatar win Academy Awards for Best Achievement in Visual Effects, and in 2010 the developers of the Light Stage received an Academy of Motion Pictures Arts and Sciences Scientific and Engineering Academy Award for the design and engineering of the Light Stage technologies, recognizing more than 10 years of research, development and application of the technologies.
Syntouch
Quantifying Touch

Headquartered in Los Angeles near the University Park Campus, USC spinout Syntouch developed and sells the first sensor technology that endows robots with the ability to replicate, and sometimes exceed, the human sense of touch. Syntouch mimics the physical properties and sensory capabilities of the human fingertip in its proprietary BioTac® sensors.

These sensors and an understanding of human tactile perception enabled Syntouch to develop tactile sensing instruments that quantify how materials feel to consumers – The Syntouch Standard®. This is analogous to a digital color meter, but for touch. Fortune 500 companies that produce automobiles, personal care products, consumer electronics and apparel are now using or evaluating the capability of our technology. Syntouch’s sensors also enable robotic and prosthetic hands to achieve human-like dexterity.

Syntouch was formed by members of the Medical Device Development Facility at USC including its director, Dr. Gerald E. Loeb of the USC Viterbi School of Engineering and USC graduates Jeremy Fishel (Viterbi), Matthew Borzage (Viterbi) and David Groves (USC Marshall School of Business). Syntouch’s founders worked with the USC Stevens Center for Innovation to license a portfolio of USC technologies central to their company.

Syntouch mimics the physical properties and sensory capabilities of the human fingertip in its proprietary BioTac® sensors, shown mounted on the Shadow Dexterous Hand (Image courtesy of Syntouch).
Lotus Tissue Repair
From a small academic laboratory to a potential therapy for a life-threatening human disease

USC Professors Drs. David Woodley and Mei Chen from the Keck School of Medicine of USC helped form Lotus Tissue Repair, Inc. in order to commercialize their research finding that a specialized protein in connective tissue — human, recombinant type VII collagen (C7) — can be administered to treat a devastating genetic disease called Dystrophic Epidermolysis Bullosa (DEB). Young patients with DEB are often referred to as “butterfly children” because their skin is as frail as a butterfly’s wings. Those with the disease suffer from blistered skin and widespread skin wounds until about the age of 25 to 30, when they develop an aggressive squamous cell carcinoma in one of their wounds that usually metastasizes and takes their life.

Drs. Woodley and Chen partnered with the USC Stevens Center for Innovation to seek companies interested in licensing various aspects of the C7 work. USC Stevens helped connect the USC researchers to external entrepreneurs best suited to develop and commercialize a protein replacement therapy. Drs. Woodley and Chen partnered with them to form Lotus Tissue Repair. Lotus went on to secure a total of $26 million in milestone-driven funding from Third Rock Ventures and was acquired by Shire Plc, a biopharmaceutical company specializing in developing protein replacement therapies for several orphan diseases. Shire purchased Lotus Tissue Repair in 2013 for approximately $50 million, with added potential success milestones totaling an additional $275 million.

Recombinant C7 has the potential to be a first-in-class systemic therapy for the treatment of Dystrophic Epidermolysis Bullosa. Shire is continuing to perform research studies on Lotus Tissue Repair’s therapy toward initial human trials. Drs. Woodley and Chen continue to be consultants for Shire on this project to one day translate their research into a therapy for this devastating disease.
CORPORATE COLLABORATIONS & STRATEGIC ALLIANCES

At USC Stevens, we believe in a culture of partnership and collaboration. Together with our partners, we strive to bring together the right people and resources to accelerate the translation of basic research into tangible products and services. We have learned that the right people, transparent processes and flexible collaboration models are the key to success.

With 21 exceptional academic schools and units, over 43,000 students and 25,000 faculty and staff, finding the right people and research areas relevant to industry needs can be quite challenging. USC Stevens provides experts that can quickly navigate the vast USC environment and harness the right USC resources to achieve company strategic goals. By cultivating strong relationships with USC faculty, working closely with various departments such as the Department of Contracts and Grants, Clinical Trials Office, and USC’s Office of Advancement, we aim to ensure the highest quality of service for our faculty, staff and external partners.

The USC Stevens Corporate Collaborations team will work with you to formulate the right partnering strategies for success. Collaborate with us at: http://stevens.usc.edu/industry/corporate-collaborations.

TYPES OF ENGAGEMENT
- Involvement with researchers
- Student-oriented engagement
- Access to resources
- Involvement with centers of expertise & schools
- Economic development

TYPES OF RELATIONSHIPS
- Sponsored research
- Licensing
- Incubator access
- New company creation
- Equity investment
- Flexible, multi-faceted
CORPORATE COLLABORATIONS  |  SUCCESS HIGHLIGHTS

Drug Discovery and Development

Pfizer Centers for Therapeutic Innovation

Accelerating translation of novel targets to the clinic

USC is part of this innovative Pharma program with leading university and academic research centers nationwide. USC has a master research collaboration agreement with Pfizer CTI that focuses on large molecule targets. Pfizer CTI awards to USC faculty to date have focused on cancer and immunoncology.

GPCR Consortium

New International Research Coalition

The GPCR Consortium is a public-private open source partnership to advance GPCR (G-protein-coupled receptors) research for drug development and bolsters USC’s efforts to promote biomedical research in Los Angeles. Nine multinational pharmaceutical companies (Amgen, Sanofi, Ono, Pfizer, Merck, Lundbeck, Novo Nordisk, Taisho, Boehringer Ingelheim) are part of this consortium. Projects are led by Dr. Ray Stevens and include interdisciplinary collaborations with researchers at the Bridge Institute at USC.
As an Early Access partner with Fluidigm Corp., USC is the first academic center to apply a novel imaging mass cytometer (IMC) platform, expected to revolutionize the understanding of spatial arrangement, function and communication of single cells in solid tissue. The partnership with Fluidigm will accelerate the application of high-resolution, single cell biology research through the interaction of critical shared resources at USC with public and private partners in pioneering fields such as cancer biology, stem cells, engineering and informatics. Projects are being led by Drs. Peter Kuhn, Jim Hicks, Akil Merchant and Scott Fraser. Additionally, Fluidigm and USC plan to expand their collaboration into single-cell genomics as well as proteomics, to fully explore cancer biology at the single-cell level.

The USC Norris Comprehensive Cancer Center has entered into a new collaboration agreement with Trovagene, Inc., a San Diego-based developer of circulating tumor DNA (ctDNA) molecular diagnostics for cancer monitoring. This collaboration seeks to establish a standardized framework for using Trovagene’s Trovera™ urine liquid biopsy test in the clinic and define best practices for liquid biopsy testing from urine. Dr. Amir Goldkorn from the USC Norris Comprehensive Cancer Center leads the collaboration focused on conducting several novel studies that have potential to improve the standard-of-care for cancer treatment.

The Foundation for the National Institutes of Health (FNIH) Biomarkers Consortium launched a research partnership to determine whether liquid biopsies can be used instead of traditional solid tumor biopsies for diagnosing and monitoring metastatic colorectal cancer. Dr. Peter Kuhn of USC leads the project team for “High Definition Single Cell Analysis of Blood and Tissue Biopsies in Patients with Colorectal Cancer Undergoing Hepatic Metastasectomy” (HD-SCA). The team comprises experts from the National Cancer Institute, the U.S. Food and Drug Administration, USC, Scripps Clinic, Baylor College of Medicine, Mayo Clinic and four sponsoring pharmaceutical companies.
Northrop Grumman Corporation and the University of Southern California (USC) Viterbi School of Engineering have teamed up to establish a new home for advanced research in optical materials and nanophotonic devices. The new organization – the Northrop Grumman Institute of Nanophotonics and Nanomaterials (NG-ION2) – is based at USC. The Institute forms teams from the university and the aerospace industry to explore the properties of tiny structures and materials that exist only at the atomic level. Drs. Andrea Armani, of USC Viterbi and Jesse Tice, senior scientist and nanomaterials group lead, Northrop Grumman Aerospace Systems, serve as NG-ION2’s codirectors. Dr. Armani leads a research group at USC focused on integrated photonics.
We are an active partner and take pride in providing a nurturing environment for student training and exploration. This is accomplished by hosting business competitions, providing internships, offering pro-bono legal clinics and supporting startup events.

USC Stevens Innovation Programs & Resources

The USC Stevens Technology Advancement Grants program supports early stage technologies invented at USC through validation or proof-of-concept development. The awards add value to unlicensed USC-owned technology, aiming to increase the probability of obtaining a license in the future.

We offer complimentary legal guidance to USC faculty, students and alumni through our Legal Office Hours Program and we help identify and connect experienced managers and advisors to our startups.

USC Stevens also hosts a Seminar Series presenting expert discussions on topics relating to intellectual property, startup creation and venture funding.

The annual USC Stevens Student Innovator Showcase awards thousands in USC-sponsored funding to USC student entrepreneurs and startups in a student business competition to help students advance their ideas and discoveries, and to launch businesses.

These programs benefit students by providing them with direct participation in USC Stevens technology transfer activities and interactions with local and global venture and entrepreneur communities.

Additional USC Resources Supporting Innovation & Entrepreneurship Programs at USC

Incubate USC at http://incubate.usc.edu is a central destination for entrepreneurs at USC where talented students, distinguished faculty, expert staff and supportive mentors come together from across the campus to optimize the entrepreneur ecosystem and strengthen our community.

Global Professional Associations

Through the Office of Research and the USC Stevens Center for Innovation, we are members and active participants in many associations aimed at advancing innovation, including: University Industry Demonstration Partnership (UIDP), Licensing Executives Society (LES), Association of University Technology Managers (AUTM), Association of Strategic Alliance Professionals (ASAP), Biocom, Biotechnology Innovation Organization (BIO), California Life Sciences Association, Los Angeles Venture Association, National Academy of Inventors, San Diego Venture Group and Southern California Biomedical Council (SoCalBio).
OUR INFORMATION  |  CONTACT US

Website
http://stevens.usc.edu

Facebook
USC Stevens Center for Innovation

Email & Phone
info@stevens.usc.edu
213.821.6063

Twitter
@USCStevens

USC Stevens is located in downtown Los Angeles, where the university’s name and shield stand atop a landmark 32-story office tower
(USC image by Gus Ruelas)
USC Stevens supports technology transfer of university-owned IP by directly managing the process required to successfully license university research to the business community. USC Stevens has seen continued upward growth in innovation as measured by the number of invention disclosures, negotiated licenses, and IP-backed startups and licensing revenue. Royalties and other revenue received by USC under the license agreements are shared with USC inventors in accordance with the USC Intellectual Property Policy.

**USC Stevens Technology Commercialization**
**4-Year Dashboard FY2015-2018**

- 1,022 Invention Disclosures
- 274 US Patents issued
- 192 Licenses
- 47 Startups
- $36.2M Licensing Revenue