

MICHAEL J. MASSIMINO, Ph.D.

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EDUCATION:

- Ph.D. Mechanical Engineering, Massachusetts Institute of Technology, 1992
- Degree of Mechanical Engineer, Massachusetts Institute of Technology, 1990
- M.S. Mechanical Engineering, Massachusetts Institute of Technology, 1988
- M.S. Technology and Policy, Massachusetts Institute of Technology, 1988
- B.S. Industrial Engineering, Columbia University, 1984

SPECIAL HONORS:

- Two NASA Space Flight Medals
- NASA Distinguished Service Medal
- National Space Club's Space Communicator Award
- Columbia Community Impact Outstanding Community Service Award
- Long Island Reads Book of the Year Award
- Honorary Doctorate, Hofstra University
- Long Island Air & Space Hall of Fame Inductee
- Columbia Engineering School Alumni Association Egleston Medal for Outstanding Engineering Achievement
- NY Times Bestselling Author
- Christopher Award
- Star of the Italian Solidarity (Italian Knighthood)
- Fellow of the Explorers Club
- NASA Hubble 25th Anniversary Commendation
- Cradle of Aviation Museum Spirit of Discovery Award
- American Institute of Aeronautics and Astronautics Haley Space Flight Award
- Astronautical Society's Flight Achievement Award
- Sergei P. Korolev Diploma
- Aviation Week & Space Technology Laurel Award
- National Museum of Catholic Art & Library Angel Leadership Award
- DeWitt Clinton Masonic Award for Community Service
- DaVinci Award, Italian Heritage and Cultural Committee of New York
- Order of Sons of Italy in America Marconi Award
- Order of Sons of Italy in America Pre-Centennial Award

PROFESSIONAL ORGANIZATIONS:

- Explorers Club
- Association of Space Explorers

EXPERIENCE:

July, 2014 to Present: Professor of Professional Practice, Department of Mechanical Engineering, School of Engineering and Applied Science, Columbia University, New York, NY

- Teaching “Introduction to Human Spaceflight” – junior/senior/graduate level course which includes a group design project. Topics include: history of human spaceflight, the space environment, life support requirements, habitability and crew accommodations, working and living in space, spaceflight human factors, spaceflight analogs, psychology of spaceflight, spacewalking, spacesuits, environmental control and life support systems, space privatization and commercialization, space robotics, spaceflight accidents, space policy, aerospace medicine, science payloads, zero gravity science, Hubble Space Telescope servicing, designing space tools, astronaut selection and training, space careers, and future spacecraft.
- Teaching “The Art of Engineering” – mechanical engineering section for first year engineering students. Design project focuses on using computer aided design, laser cutting, and 3D printing for designing and building a small rocket that launches into the sky and returns to the ground as a glider.
- Columbia Undergraduate Engineering Admissions Support – presentations at STEM schools around the country. 2017-2019 area visits: Boston, Kansas City, St. Louis, Minneapolis, New Orleans, Austin, South Texas Valley, Albuquerque, Santa Fe, Las Vegas, Phoenix, Central New Jersey, Memphis, Atlanta, Nashville, Denver, Salt Lake City, Houston, and Dallas. In 2018-2019 presentations reached over 7,400 STEM interested students. For schools visited in fall 2017 and fall 2018, the 2019 Columbia Engineering applicant pool showed a significant increase in STEM applications. Wrote mass-mailing letters to prospective and accepted students, and gave keynotes and master classes at STEM recruitment and admitted students yield events.
- Faculty Advisor for the Columbia Space Initiative (CSI) - Columbia’s student space founded in 2015 with current membership over 100 students. Supporting CSI’s students and their missions: High Altitude Balloons – sending cameras, experiments, and other payloads to new heights; Blue Origin – sending a scientific payload to sub-orbital space; CubeSat – sending the first satellite designed by Columbia undergraduates into low-Earth orbit; Micro-g – NASA competition to design an spacewalking tool and test it in the Johnson Space Center Neutral Buoyancy Laboratory; Outreach & Operations – inspiring the next generation of space travelers; RASC-AL – NASA competition to design mission architectures for future crewed mission in space; Rockets – building a rocket to be entered into the Spaceport America Cup.
- Columbia Engineering Outreach Support – presentations at under-represented elementary and middle schools in the New York City area to encourage STEM education and careers.
- Director of the Columbia Extreme Engineering Program Lecture Series – Coordinating guest speaker events to discuss engineering in extreme environments including space, undersea, and arctic explorers, scientists, and engineers.
- Student Research Support - Advised undergraduate and graduate student independent research projects on a software application to assist astronauts with photography requirements and targets on the International Space Station, and on the investigation of technical and policy solutions for debris mitigation in Earth-orbit.
- Faculty Research Support – Domain expert and consultant on NASA grant NNX16AD13G S004, "Versatile Manipulation for Assistive Free Flyers." Working with

PI to develop case studies and derive requirements for robotic manipulation on board the International Space Station.

- Alumni development – attending events, supporting development campaigns, and keynote speeches including Reunion 2019.
- Public Outreach – keynote talks at STEM and technology conferences including Web Summit, Rise, MARS, Collision, and the National STEM Teachers Conference.

July, 2014 to Present: Senior Advisor for Space Programs, Intrepid Museum, New York, NY

- Co-Curator for space related exhibits including “Hubble @ 25” – the science and engineering accomplishments of the Hubble Space Telescope celebrating its 25th anniversary in space; and “Personal Space” – collection of personal items that astronauts have flown in space.
- Presentations to students and adults as part of school visits and museum events including “Kids’ Week” and “Space and Science Festival.” Assist with public programs by helping with content development and inviting colleagues from the space program and other areas of exploration and research.
- Media spokesperson for the Museum for print, television, and social media.
- Host of museum video series including “Intrepid Minute” and “Aircraft of the Month.”

February, 2012 to May, 2013: Executive Director, Rice Space Institute (RSI), Houston, TX

- Assigned to Rice University as part of NASA’s Executive On-Loan Program.
- Developed research and technology development relationships between Rice, NASA, and industry.
- Explored partnerships between Rice, NASA, and industry in various engineering application areas including engineering design, space life sciences and human performance, biomedical devices, robotics, and materials science.
- Created student leadership and academic opportunities through the RSI Student Auxiliary, internships, and graduate degree programs in space studies.
- Provided space related outreach opportunities for the Rice community and the general public through the Space Frontiers Lecture Series, RSI-Scientia Conference, and advocacy with city, state, and federal government representatives.

August, 1996 to July, 2014: Astronaut, NASA Johnson Space Center, Houston, TX

- Astronaut training including: land and water survival schools, T-38 high performance jet training, Space Shuttle and International Space Station systems qualification, spacewalking skills, control of space robotic manipulators, crew resource management, spaceflight leadership training, and media relations.
- Astronaut Office Robotics Branch (1996 to 2000) - developed a new robotics display system for the control of space robotic systems.
- Astronaut Office Extravehicular Activity (EVA/spacewalking) Branch (2003 to 2006) – Technical Liaison to the Johnson Space Center EVA Program Office ensuring space flight readiness and spacesuit integrity for spacewalks.
- Astronaut Office Capcom (Spacecraft Communicator) Branch (2002 to 2006 & 2009 to 2011) – Capcom in the Mission Control Center for the Space Shuttle and for the International Space Station. Served as prime communicator between the flight control team in Houston and the astronauts in space.

- Chief, Astronaut Appearances Office (2009 – 2012) – responsible for coordination of all Astronaut public appearances including outreach to schools, corporations, NASA facilities, and Congressional visits.

SPACE FLIGHT EXPERIENCE:

Mission Specialist, STS-109, Columbia (March 1-12, 2002).

- Fourth Hubble Space Telescope servicing mission.
- Performed two spacewalks during the mission and totaled 14 hours and 46 minutes of spacewalking time.
- Successfully upgraded the Hubble Space Telescope leaving it with a new power unit, a new camera (the Advanced Camera for Surveys), and new solar arrays.
- STS-109 orbited the Earth 165 times, and covered 4.5 million miles in 262 hours and 10 minutes.

Mission Specialist, STS-125, Atlantis (May 11-24, 2009)

- Fifth and final Hubble Space Telescope servicing mission.
- Lead spacewalker on two spacewalks that totaled 15 hours and 58 minutes of spacewalking time.
- Developed new spacewalking tools and techniques to perform the first in-flight repairs of Hubble scientific instruments, rather than traditional “remove and replace” of entire instruments.
- Operated the Space Shuttle’s robotic arm.
- Refurbished the Hubble Space Telescope with four new or rejuvenated scientific instruments, new batteries, new gyroscopes, and a new computer.
- STS-125 broke STS-109’s record for spacewalking with a new record of 36 hours and 56 minutes during five spacewalks.
- STS-125 traveled 5,276,000 miles in 197 Earth orbits and was accomplished in 309 hours and 37 minutes.

ADDITIONAL EXPERIENCE:

August, 1995 to July, 1996: Assistant Professor, Georgia Institute of Technology, Atlanta, GA

- Assistant Professor (Tenure Track) in the School of Industrial and Systems Engineering.
- Taught the class “Human-Machine Systems Engineering” for 3 semesters.
- Conducted research and advised students in the area of human-machine interfaces for space and aircraft systems in the Georgia Tech Center for Human-Machine Systems Research.

August, 1992 to May, 1995 & September, 2004 to present:

Adjunct Professor, Rice University, Houston, TX

- Adjunct Professor in the Department of Mechanical Engineering & Materials Science.
- Taught the course, “Feedback Control of Mechanical Systems” for two semesters.
- Served on thesis committees for students, gave guest lectures and seminars.

August, 1992 to August, 1995:

Research Engineer, McDonnell Douglas Aerospace, Houston, TX

- Principal Investigator on an independent research and develop project that developed laptop computer displays to assist operators of the Space Shuttle Remote Manipulator.

- Principal Investigator on the “Manipulator Position Display Research Project,” a robotic operator laptop program which was evaluated in space on Space Shuttle flight STS-69.
- Principal Investigator on a joint project with NASA and Spar Aerospace on the redesign of the Space Shuttle Remote Manipulator System Display and Control Panel.

PATENTS:

- M.J. Massimino and T.B. Sheridan, “Apparatus for Providing Sensory Substitution of Force Feedback,” U.S. Patent Number 5451924, September, 1995.
- M.J. Massimino, T.B. Sheridan and N.J.M. Patrick, “Apparatus for Providing Vibrotactile Sensory Substitution of Force Feedback” US Patent Number 5619180, April, 1997.

PUBLICATIONS:

- M. Massimino Spaceman: An Astronaut’s Unlikely Journey to Unlock the Secrets of the Universe. New York: Crown, 2016.
- M. Massimino, “A View of the Earth,” Esquire Online, August, 2013.
- M. Massimino, “A View of the Earth,” in The Moth, edited by Catherine Burns, New York: Hyperion, 2013.
- M.J. Massimino, “Improved Force Perception Through Sensory Substitution,” Control Engineering Practice, 1995, Vol. 3, No. 2, pp. 215-222.
- M.J. Massimino and A.A. Rodriguez, “Space Shuttle Flight Demonstration of the Manipulator Position Display,” 25th International Conference on Environmental Systems, San Diego, CA, July, 1995, Paper #951521.
- M.J. Massimino and A.A. Rodriguez, “Flexible Operator Aids for Telemanipulation,” Telemanipulator and Telepresence Technologies, SPIE Proceedings Vol. 2351, SPIE’s International Symposium on Photonics for Industrial Application, Session on Components, Systems, Applications, and Human Operator Performance, October, 1994.
- M. Massimino, A. Rodriguez, E. Ochoa, J. Clervoy, M. Garneau, and D. Engelbert, “A Manipulator Position Display for Space Servicing Operations,” AIAA Space Programs and Technologies Conference, Huntsville, AL, September, 1994, Paper #AIAA 94-4560.
- D. Woods, M. Kearney, D. Crosse, and M. Massimino, “Space Station Robotics Task and Validation and Training,” Chapter 17 in Teleoperation and Robotics in Space, Progress in Astronautics and Aeronautics, Vol. 161, Edited by S.B. Skaar and C.F. Ruoff, Washington: American Institute of Aeronautics and Astronautics, 1994, pp. 475-489.
- M.J. Massimino and T.B. Sheridan, “Teleoperator Performance with Varying Force and Visual Feedback,” Human Factors: The Journal of the Human Factors and Ergonomics Society, Volume 36, Number 1, March 1994, pp. 145-157.
- M.J. Massimino and T.B. Sheridan, “Sensory Substitution for Force Feedback in Teleoperation,” Analysis, Design and Evaluation of Man-Machine Systems 1992, Selected Papers from the 5th IFAC/IFIP/IFORS/IEA Symposium, The Hague, The Netherlands, June, 1992, H.G. Stassen, Editor, Oxford: Pergamon Press, 1993.
- M.J. Massimino and T.B. Sheridan, “Using Auditory and Tactile Displays for Force Feedback,” in Telemanipulator Technology, Hari Das, Editor, SPIE Proceedings, Vol. 1833, pp. 325-336, 1993.
- M.J. Massimino and T.B. Sheridan, “Sensory Substitution of Force Feedback for the Human-Machine Interface in Space Teleoperation,” World Space Congress, Washington, D.C., August, 1992, Paper #IAF/IAA-92-0246.
- M.J. Massimino, “Using Bisensory Feedback Displays for Space Teleoperation,” Acta Astronautica, Vol. 24, 1991, pp. 391-397.

- N.J.M. Patrick, T.B. Sheridan, M.J. Massimino, and B.A. Marcus, “Design and Testing of a Non-Reactive, Fingertip, Tactile Display for Interaction with Remote Environments,” Cooperative Intelligent Robotics in Space, SPIE Vol. 1387, pp. 215-222, Proceedings of SPIE’s International Symposia, OE/Boston ’90, Applications in Optical Science and Engineering, Boston, MA, November 4-9, 1990.
- M.J. Massimino, T.B. Sheridan, and J.B. Roseborough, “One Handed Tracking in Six Degrees of Freedom,” 1989 IEEE International Conference on Systems, Man, and Cybernetics, Conference Proceedings, Vol. 2, pp. 498-503.
- M.J. Massimino, and T.B. Sheridan, “Variable Force and Visual Feedback Effects on Teleoperator Man/Machine Performance,” Proceedings of the NASA Conference on Space Telerobotics, Vol. 1, pp. 89-98. Pasadena, CA, January 31 – February 2, 1989.
- M.J. Massimino, and T.B. Sheridan, “Effects of Force and Visual Feedback on Space Teleoperation,” Proceedings of the 23rd Annual Conference on Manual Control, Cambridge, MA, June 22-24, 1988.
- M.J. Massimino, “Remote Servicing of a Solar Power Satellite,” Space Manufacturing 6: Nonterrestrial Resources, Biosciences, and Space Engineering, pp. 148-152. Proceedings of the Eighth Princeton/AIAA/SSI Conference, Princeton, NJ, May 6-9, 1987.

SELECTED TELEVISION AND MOVIE APPEARANCES

- Frequent appearances on
 - Morning Shows: Good Morning America, Today Show, Good Day New York
 - News Outlets: ABC, CBS, CNN, CNBC, MSNBC, Fox News, PBS
 - Radio: NPR Science Friday, Sirius XM Radio
 - Educational TV: National Geographic Channel, Science Channel, Discovery Channel, PBS, Smithsonian Channel
- Host – “The Planets and Beyond,” Science Channel, spring and summer 2018
- Segment Host – “One Strange Rock,” National Geographic Channel, Spring 2018
- Host – “The Planets,” Science Channel, summer 2017
- Host – “The Great American Eclipse,” Science Channel, August, 2017
- Host – Star Talk Radio All-Stars,
- Co-Host - “Live From Space,” National Geographic Channel, 14 March 2014
- Co-Host - “Live From Space: Lap of the Planet,” Channel 4 (UK), 16 March 2014
- Recurring Character (cameos) - “The Big Bang Theory,” CBS
 - Season 5, Episode 15, 2 Feb. 2012, “The Friendship Contraction”
 - Season 5, Episode 24, 10 May 2012, “The Countdown Reflection”
 - Season 6, Episode 2, 4 Oct. 2012, “The Decoupling Fluctuation”
 - Season 6, Episode 4, 18 Oct. 2012, “The Re-Entry Minimization”
 - Season 7, Episode 16, 27 Feb. 2014, “The Table Polarization”
 - Season 8, Episode 3, 29 September 2014, “The First Pitch Insufficiency”
- Guest Expert on CNN and Fox News – Various appearances October- December, 2013
- Person of the Week - “World News Tonight with Diane Sawyer,” ABC, October 2013
- Judge - “The Big Brain Theory,” Discovery
 - Season 1, Episode 1, 1 May 2013, “The Next Great Innovator”
 - Season 1, Episode 5, 29 May 2013, “Waterfall”
- Guest - “Late Show with David Letterman,” CBS
 - Season 17, Episode 164, 30 June 2010
- Guest - “The Late Late Show with Craig Ferguson,” CBS
 - Season 8, Episode 306, 13 Sept. 2012

- Season 8, Episode 213, 26 Apr. 2012
- Season 7, Episode 185, 30 June 2011
- Season 6, Episode 118, 12 March 2010
- Season 5, Episode 189, 15 July 2009
- Host - “Known Universe,” National Geographic Channel,
 - Season 3, All 8 episodes, May – June 2011
- Segment Host - “NOVA Science Now,” PBS
 - Season 5, Episode 1, 19 Jan. 2011, “Can We Make It to Mars?”
- Featured Astronaut - “HUBBLE IMAX 3D,” Warners Brothers and IMAX Corp., March 2010
- Featured Astronaut - “Mission Critical: Hubble,” Discovery, March 2010
- Guest - “Attack of the Show!” G4, March, 2010
- Guest - “Last Call with Carson Daly,” NBC, May 2010
- Featured Astronaut - “NOVA: Hubble’s Amazing Rescue,” PBS, October 2009
- Person of the Week - “World News Tonight with Charles Gibson,” ABC, May 2009

SELECTED PUBLIC APPEARANCES AND KEYNOTES:

- First Astronaut to use Twitter from Space – 1.2 million followers currently
- Royal Society
- British Science Museum
- Massachusetts Institute of Technology
- Rice University
- Columbia University
- Georgia Institute of Technology
- Tel Aviv University
- New York University, Abu Dhabi
- Smithsonian Institution
- American Museum of Natural History
- USS Intrepid Museum
- New York Hall of Science
- Israeli Embassy
- Italian Embassy
- U.S. Presidential Inaugural Parade
- United States Congress
- The Vatican
- The White House