150 Years of "Brains and Heart"

The History of Syracuse Womxn in STEM

a celebration of the University's Sesquicentennial and the International Day for Women and Girls in Science

Syracuse University London

curated by Dr Becca Farnum (rlfarnum@syr.edu), February 2020

Elizabeth Blackwell was the first woman to attend medical school in the US when the 150 male students at Geneva Medical College voted to accept her in 1847 (she was rejected by every other school she applied to)

two years later, her thesis on typhoid fever was published in the *Buffalo Medical Journal*

Geneva Medical College transferred to Syracuse University in 1871

image courtesy of Time Life Photos

Elizabeth Blackwell, Graduate Class of 1849

Medicine
first woman on the General Medical Council register

Syracuse Womxn in STEM Showcase

image courtesy of Getty Images

the only Medal of Honor ever presented to a non-male was received by Mary Walker, M.D.

Dr Walker was a Civil War surgeon, women's dress reformer, and abolitionist

personal writing suggests that, if alive today, Dr Walker might have identified as trans* or used non-binary pronouns

Mary Edwards Walker, Class of 1855

Syracuse Medical College
considered first female surgeon to serve in the US Military

image courtesy of Syracuse University Archives

in Syracuse University's founding speech, Dr Peck declared the school should be open to women and "persons of any nation or color", promising that "brains and heart shall have a fair chance" as the University sought "all revelations in science"

Syracuse University, Founded 24 March 1870

always co-educational
now home to more than one hundred full-time faculty women in STEM

nineteen people graduated at Syracuse University's first commencement

among them was Mary L. Huntley, who received a Bachelor of Science

she was the only woman in her class

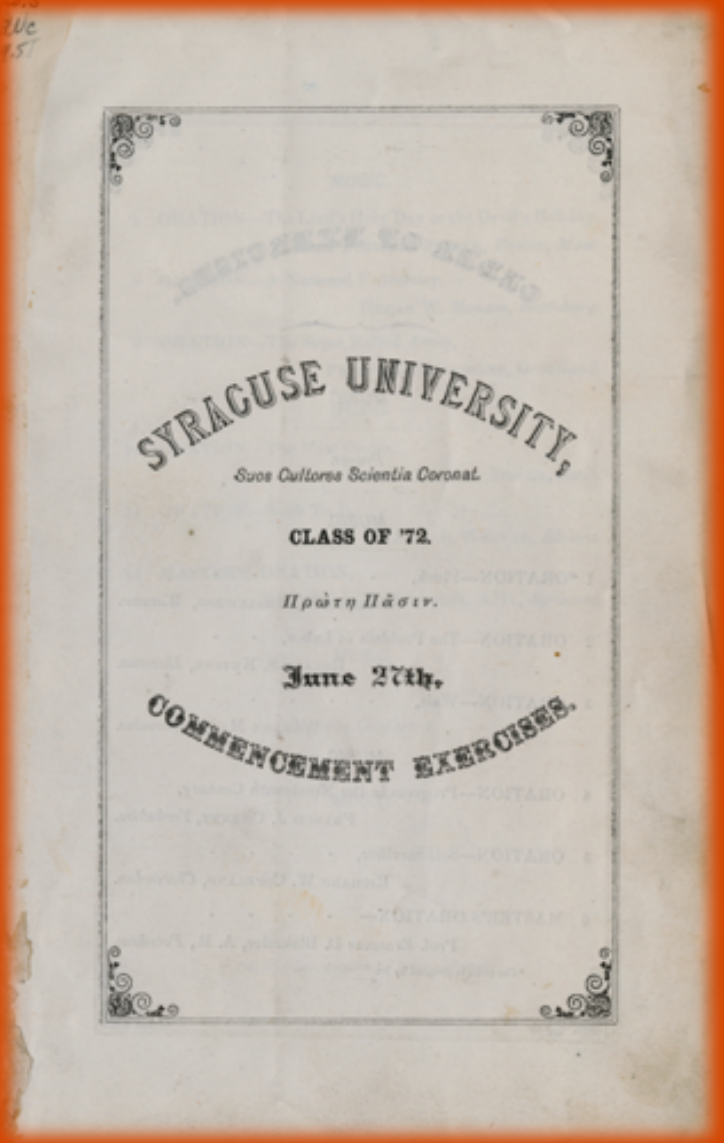

image courtesy of Syracuse University Archives

Mary L. Huntley, Class of 1872

Bachelor of Science
Syracuse's first alumna

image courtesy of Syracuse University Archives

Syracuse University's first African American alumna in medicine graduated in 1876 at the age of 26, vowing

"I will never, never see a human being in need of aid again and not be able to help."

her specialisms were family medicine, obstetrics & pediatrics

Sarah Loguen Fraser, Class of 1876

Medicine
first female physician to practice in the Dominican Republic

Syracuse Womxn in STEM Showcase

image courtesy of Mount Holyoke Archives

Syracuse awarded the United States' first PhD in Botany to a woman in 1888

she and her spouse went on multiple expeditions to Africa and the Canary Islands

the Smithsonian Institution now houses many of her plant collections

Alice Carter Cook, Graduate Class of 1888

PhD, Botany
academic powerhouse in one of Syracuse's first alumni couples

Syracuse became the first US school to grant a Ph.D. in biology to a woman in 1889

Cornelia Maria Clapp went on to become a professor of zoology and, in 1906, appeared in the *American Man of Science*'s list of 150 most prominent zoologists in the US

image courtesy of "Women from History"

Cornelia Maria Clapp, Graduate Class of 1889

Ph.B., Zoology
professor at Mount Holyoke

Syracuse's second female doctoral graduate in botany was a specialist in the morphology and embryology of *Cuscuta*, a genus of parasitic plants

orphaned at seven, she began work at the age of sixteen in a New England cotton factory before beginning her teaching career, which lasted for thirty-five years

image courtesy of Mount Holyoke Archives

Henrietta Hooker, Graduate Class of 1889

PhD, Botany
Chair of Botany at Mount Holyoke

Syracuse Womxn in STEM Showcase

World War II led to the establishment of a special training program for military service at Syracuse University

women were trained as pilots and stepped into a variety of STEM roles in the private sector as well

image courtesy of Syracuse University Archives

War Service College, launched 1943

built on the World War I Students' Army Training Corps and paved the way for the Institute for Veterans and Military Families

image courtesy of Winthrop University Archives

Syracuse's STEM teaching faculty have included female leaders in their fields, including mathematician Ruth Stokes, whose PhD from Duke explored "A geometric theory of solution of linear inequalities"

during World War II, she played a crucial role training army and navy cryptographers

Ruth W Stokes, taught at Syracuse 1947-1959

Mathematics
professor at Winthrop and the American University of Beirut

the first woman to win the Perkin Medal (the highest US honour for applied chemistry) was granted the award in 1992

she holds 108 patents

Edith Flanigen was inducted into the National Inventors Hall of Fame in 2004 and received the National Medal of Technology in 2012

image courtesy of Lee Balgemann

Edith Marie Flanigen, Graduate Class of 1952

MSc, Inorganic Physical Chemistry
first female senior research fellow at Union Carbide

Syracuse Womxn in STEM Showcase

image courtesy of Web of Stories

this Syracuse alumna was successful in pressuring the American Geophysical Union to stop meeting at venues that were closed to women and African Americans

she created models to predict sunspots and spacecraft radiation absorption, and demonstrated links between solar activity & climate change

Joan Feynman, Graduate Class of 1958

PhD, Physics
2002 winner of NASA's Exceptional Achievement Medal

the author of *No More Hot Flashes and Other Good News* published their work in 1983, with a revised edition in 1998

her study on the "Use of Mefenamic Acid in the Treatment of Primary Dysmenorrhea" explored the use of arthritis medication for menstrual cramps

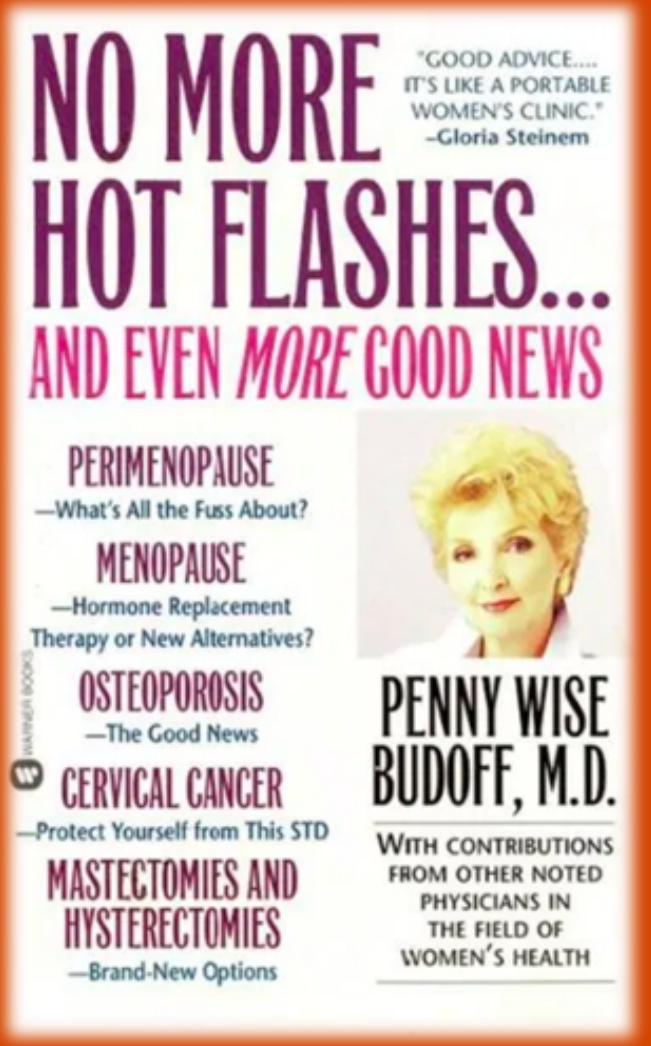

image from Grand Central Publishing

Penny Wise Budoff, Class of 1959

Medicine
New York Times-named "pioneer in women's health"

Syracuse Womxn in STEM Showcase

image courtesy of PennState

a Syracuse biologist served as the Science and Technology Adviser to U.S. Secretaries of State Rice and Clinton

her work in DNA sequencing led to a National Medal of Science in 2007

at home, Nina Fedoroff is a single mother whose first language was Russian

Nina Vsevolod Fedoroff, Class of 1966

BS, Biology and Chemistry
recipient of Syracuse University's George Arents Pioneer Medal

Syracuse Womxn in STEM Showcase

"We do not need to be viewed as black scientists... we need to be accepted simply as scientists. None of the adjectives are needed."

this graduate of Syracuse completed her PhD in the midst of the US Civil Rights Movement

she became one of the first African American women inducted into the American Chemical Society

images courtesy of Dr Torrey's family

Rubye Prigmore Torrey, Graduate Class of 1969

PhD, Analytical Chemistry
professor and researcher in radiation-electroanalytical chemistry

this double alumna of Syracuse also holds a PhD from the University and is a microlithography innovator who helped launch the PC revolution

the 2003 president of the American Chemical Society says:

> *"If we do not foster an environment of inclusivity…This can lead to missed opportunities — innovations and inventions that never get off the ground."*

image courtesy of Science History Institute

Elsa Reichmanis, Class of 1972

BS, Chemistry
former Bell Labs scientist and 2001 Perkin Medalist

Piero P. Bonissone
General Electric Co., USA

In Memoriam

Obituary for Evangelia Micheli-Tzanakou ("Litsa")

Evangelia Micheli-Tzanakou ("Litsa") was a long-time IEEE volunteer, a member of the IEEE Board of Directors, a past president of IEEE Neural Network Society, and a good friend. She passed away on September 24, 2012, after a long illness.

She had a wonderful academic and professional career. Dr. Tzanakou was a Professor and Director of the Computational Intelligence Laboratories in the Department of Biomedical Engineering at Rutgers University, and served at the University of Medicine and Dentistry of New Jersey. Between 1990 and 2000, Dr. Tzanakou was Chair of the Department of Biomedical Engineering at Rutgers where she established one of the first and most renowned Biomedical Engineering undergraduate programs in the United States. A graduate of the University of Athens (B.S., Physics 1969) and Syracuse University (M.S., Physics 1974; Ph.D., 1977), she devoted her professional career to image and signal processing applied to biomedicine, information processing in the brain, artificial neural networks, biometrics, and computational intelligence.

Biometrics was one of Litsa's passions. She was among the founders of the IEEE Biometrics Council. During her tenure as Vice President for Educational Activities, she championed the effort to create the IEEE Certified Biometrics Professional (CBP) program. The project involved over 50 experts in the field, and required wide consensus among them on the establishment of new authoritative definitions, frameworks, and vocabulary in an emerging and diverse field. Against all odds, Litsa was able to lead this initiative to a successful conclusion: The Biometrics certification program she envisioned is now a standard and a popular offering of IEEE.

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Evangelia Micheli-Tzanakou ("Litsa").

Among Litsa's many IEEE volunteer activities were her service as IEEE Director (Division Director, 2005-2006; IEEE Vice President of Educational Activities, 2008); Chair of the Awards Board (2002–2003); and Chair of the Medal of Honor Committee (2004-2006). She was elected Fellow of the New Jersey Academy of Medicine in 1986; Fellow of IEEE in 1992 ("for contributions to the application of neural networks to the analysis of the operation of the visual system"); and Founding Fellow of AIMBE in 1993. She was the author of the book "*Supervised and Unsupervised Pattern Recognition: Feature Extraction and Computational Intelligence*" (CRC Press, 2000); and coauthor of the highly popular "*Neuroelectric Systems*" (New York University Press, 1987; with Sid Deutsch). She also served as book editor for the Springer/Plenum Press Biomedical Engineering Series, and published over 280 scientific papers with coinvestigators and students.

Computational intelligence was Litsa's other passion. She was a pioneer of the IEEE Neural Network Council (NNC), the IEEE unit that eventually grew into our current Society. She shaped the NNC into maturity while serving the council in a variety of roles. After the council became a society—a challenging conversion lead by Dr. Enrique Ruspini with Litsa's strong support—she became president-elect of the IEEE Neural Network Society

Litsa's efforts were essential in changing the Society's name to IEEE Computational Intelligence Society. Many volunteers will be forever grateful to her for having given them a "home."

image courtesy of Litsa's family

this Founding Fellow of the American Institute for Medical and Biological Engineering established the first Brain to Computer Interface, helpful in studying Parkinson's disease

the Greek native served as Director of Computational Intelligence Laboratories at Rutgers University

Evangelia Micheli-Tzanakou, Graduate Class of 1977

PhD, Physics
professor of Biomedical Engineering

Syracuse Womxn in STEM Showcase

image courtesy of Ohio State University

this phototonics expert has experimented with light at Tektronix, Inc., C.S. Draper Labs, and GTE Laboratories

her “Engineering Outreach” program goes into schools around Columbus, Ohio, to build female and minority student interest in STEM

Betty Lise Anderson, Class of 1978

BS, Electrical Engineering
professor at Ohio State University since 1990

image courtesy of NASA

Eileen Collins made history as the first female pilot of a space shuttle in 1995

in 1999, she 'bested' her own record by also becoming the first female to command a US spacecraft

she is also the first astronaut to fly the Space Shuttle through a complete 360-degree maneuver

Eileen Collins, Class of 1978

BS, Mathematics & Economics
retired colonel in the US Air Force and NASA

image courtesy of Lesbians Who Teach

this openly lesbian data scientist completed a PhD at the University of Buffalo modelling HIV transmission

she's worked as a software architect for IBM's Watson Research Center and is a percussionist in the Lesbian & Gay Big Apple Corps Band

Mary Helander, Graduate Class of 1984

MS, Industrial Engineering and Operations Research
doctoral candidate at Maxwell Center for Policy Research

Syracuse Womxn in STEM Showcase

trailblazing wasn't easy for the first African American woman to graduate with a civil engineering degree from Syracuse:

> *"There were times when I did not feel supported during my time at Syracuse...It made me question if I was even cut out to be an engineer."*

she has since established the Mandel Prize, an award by alumnx of color for graduating seniors, in honor of her faculty mentor

image courtesy of CW22

Priscilla Tyree Williams, Class of 1986

BS, Civil Engineering
administrator of construction for the City of Raleigh

this co-discoverer of both the Higgs boson and the top quark set up the UK's Conference for Undergraduate Women in Physics

she has been a Fellow of the American Physical Society since 2004

originally from Italy, she graduated *summa cum laude* from the University of Pavia with her bachelor's in physics

image courtesy of Oxford University

Daniela Bortoletto, Graduate Class of 1989

PhD, Physics
head of Particle Physics at the University of Oxford

the Lockerbie Scholarship Program launched in 1990 in the wake of the events of Pan Am Flight 103

one of the first scholars studied science at Syracuse before completing her Scottish degree

image courtesy of *The Daily Orange*

Katharine Grant, Lockerbie Scholar 1990-1991

BSc Honours, Biochemistry & Immunology
occupational therapist with NHS Scotland

image courtesy of Parsons

female alumni in STEM work in all areas, including military technologies

one of Syracuse's engineering alums has over three decades' experience in cybersecurity, aerospace, and defense

she's worked for Lockheed Martin, IBM, and Honeywell Technology Solutions, Inc.

Carey A Smith, Graduate Class of 1991

MS, Electrical Engineering
President and Chief Operating Officer of Parsons Corporation

a Syracuse physicist was the LIGO Scientific Collaboration's spokesperson when the international collaboration made its first direct gravitational wave observation in September 2015

the Argentinian native was elected to membership in the US National Academy of Sciences in May 2017

image courtesy of Syracuse University News

Gabriela González, Graduate Class of 1995

PhD, Physics
professor of Physics and Astronomy at Louisiana State University

Syracuse Womxn in STEM Showcase

while serving in the Air Force as a satellite communications technician, a colleague told her she was good - and should go into engineering

so this Syracuse native who spent her childhood in Ghana went to university...and has since sent satellites into deep space with NASA and founded a virtual reality company

image courtesy of Syracuse University News

Mary Spio, Class of 1998

BS, Electrical Engineering
CEO of CEEK VR

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after thirteen years working on flooding and wastewater issues as Senior Engineer, this Syracuse alumna left ARCADIS to become a teacher

"I've made it my mission to teach my students that whatever it is they love, whatever they are passionate about, they can engage and improve it with a stronger understanding of science and engineering. In fact, the world needs them to."

image courtesy of *The Spark*

Kristin Angello, Class of 1999

BS, Civil Engineering
previously president of the Society of Women Engineers

Syracuse Womxn in STEM Showcase

before completing his PhD in Education, this Syracuse professor completed a master's in chemistry - as an out lesbian

his doctorate focused on trans* youth transitioning in college

today, he supports LGBT youth at the Q-Center in Syracuse and the LGBT Resource Center

image courtesy of Syracuse University

Rob Pusch, Graduate Class of 2003

PhD, Education and MS, Chemistry
Senior Associate Director for Syracuse's Project Advance

Syracuse Womxn in STEM Showcase

image courtesy of Syracuse University News

Syracuse's STEM professors draw inspiration from nature, exploring how fish propel themselves through water to better design aircrafts and underwater vessels

the most recent Associate Fellow of the American Institute of Aeronautics and Astronautics has completed research for the Office of Naval Research

Melissa Green, teaching at Syracuse since 2012

Mechanical and Aerospace Engineering
professor of fluid dynamics

Syracuse Womxn in STEM Showcase

this 2012 Remembrance Scholar interned at the Pennsylvania Department of Transportation and worked as a structural engineer at Parsons Brinckerhoff and a math specialist in a middle school before combining her love for children and engineering as Aquatics Director at her local YMCA

image courtesy of Times Leader

Andrea Butchko, Class of 2013

BS, Civil Engineering
member of the American Society of Civil Engineers

Syracuse Womxn in STEM Showcase

image courtesy of C-SPAN

STEM prowess is all well and good, but what about how these technologies are used?

this Syracuse alumna uses her combo of policy know-how and mathematical skill to advise Capitol Hill about cybersecurity issues

Jessica Wilkerson, Class of 2013

BS, Policy Studies with Computer Science and Mathematics
served as oversight associate for the Committee on Energy & Commerce

Syracuse Womxn in STEM Showcase

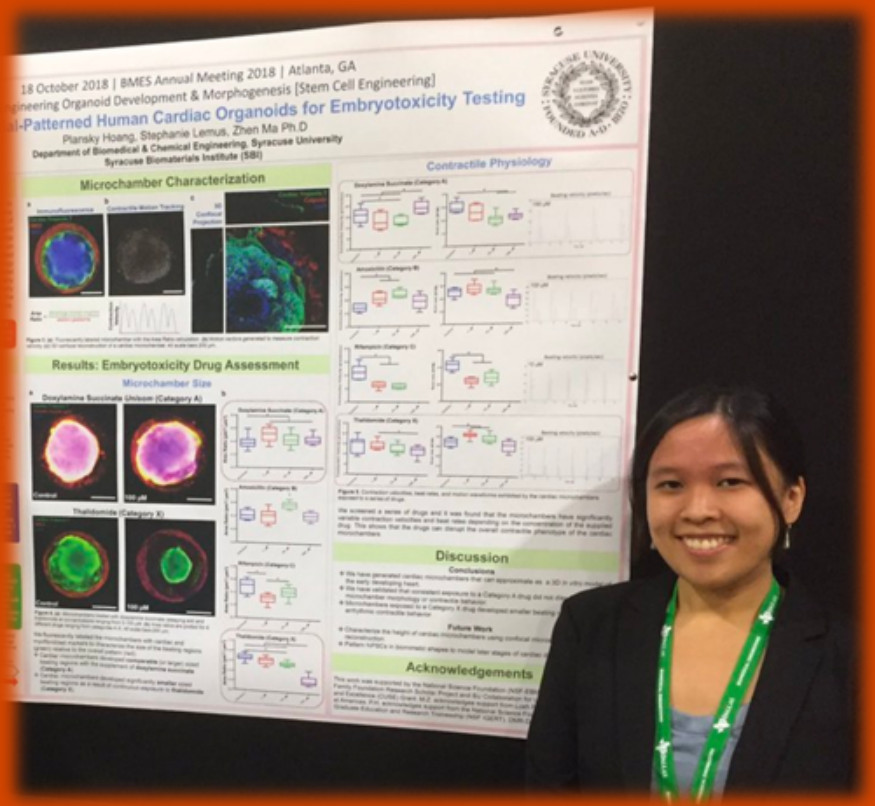

image courtesy of Syracuse's Zhen Ma Lab

a graduate research assistant at Syracuse recently won a predoctoral fellowship from the American Heart Association

the award recognises this alumna's work on *in vitro* model testing the effects of medications on developing heart cells to prevent congenital heart defects

Plansky Hoang, Class of 2015

BS, Bioengineering
doctoral candidate at Syracuse

Syracuse Womxn in STEM Showcase

Transgender, intersex, and gender non-conforming people #WontBeErased by pseudoscience

2018/10/26

Signed, 2617 scientists

As scientists, we are compelled to write to you, our elected representatives, about the current administration's proposal to legally define gender as a binary condition determined at birth, based on genitalia, and with plans to clarify disputes using "genetic testing".[1] **This proposal is fundamentally inconsistent not only with science, but also with ethical practices, human rights, and basic dignity.**[2]

The proposal is in no way "grounded in science" as the administration claims. The relationship between sex chromosomes, genitalia, and gender identity is complex, and not fully understood. There are no genetic tests that can unambiguously determine gender, or even sex. Furthermore, even if such tests existed, it would be unconscionable to use the pretext of science to enact policies that overrule the lived experience of people's own gender identities.

https://not-binary.org/statement/

in response to a proposed US policy about legal definitions of gender, Syracuse University postgraduates and teaching faculty have signed a #WontBeErased statement in support of transgender rights

signers include Julia Zeh, Ryan Dunk, Mayra C Vidal, Caitlin McDonough, Jannice Friedman, and Jason R. Wiles

Syracuse Community, 2018 and always

LGBTQ+ advocates in and out of the lab
professors, doctoral candidates, and post-doctoral researchers

Syracuse Womxn in STEM Showcase

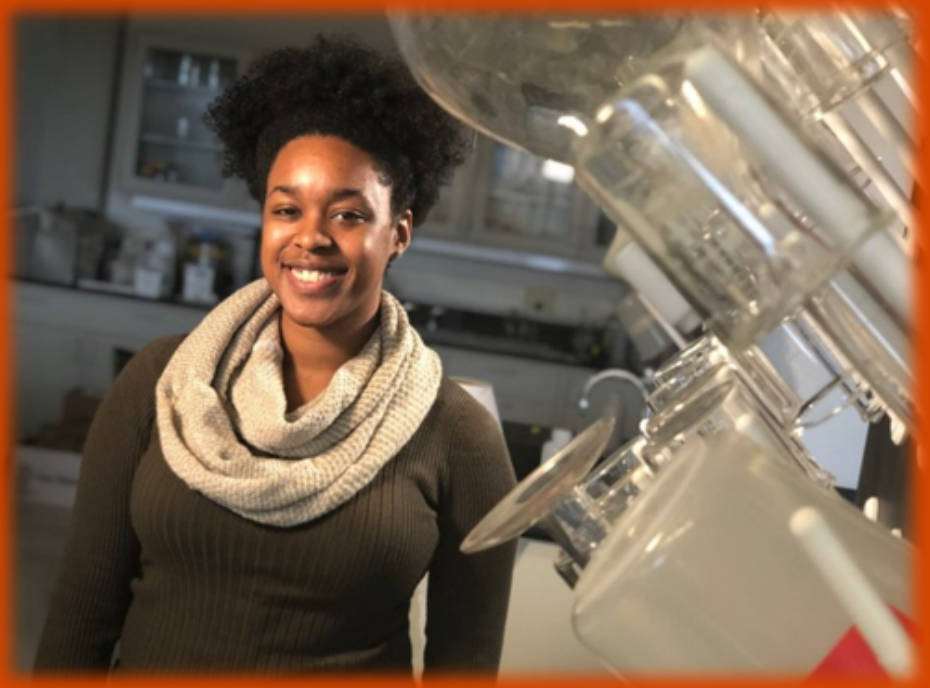

image courtesy of Syracuse University News

one of Syracuse's most recent engineering graduates studied ice storms in New Hampshire

she was Vice President of the National Society of Black Engineers and Marshal for the College of Engineering and Computer Science

she's now exploring civil engineering at a Historically Black College

Simone Burns, Class of 2019

BS, Environmental Engineering
graduate student at Florida A&M University

image courtesy of eliasmittelstadt.com

diversity in STEM encourages the development and application of technologies to far-ranging social issues, from health to environmental justice

this transgender alumnx of Syracuse has worked for the Climate Museum in New York City and created Scout, a toolkit for self-injection therapies

Elias Mittelstadt, Class of 2019

BID, Industrial & Interaction Design
winner of the Arthur J. Pulos Award for Thesis Excellence

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this 2020 Marshall Scholar interned at the Massachusetts Water Resources Authority, worked for NOAA and NASA on the Colorado River Basin, and studied water resources engineering in Australia

she's won the Udall Environmental Scholarship, Astronaut Scholarship, NOAA Hollings Scholarship and Remembrance Scholarship

image courtesy of Bethany Murphy

Bethany Murphy, Class of 2020

BS, Environmental Engineering
graduate student at the University of Bristol in August 2020

today, women in STEM are blending disciplines for maximum impact: this student's doctoral research is building methods for automatic fake news detection and intervention by using electrical engineering techniques alongside psychology and political science theories

she's also the first recipient of the Pramod K. and Anju Varshney Endowed Graduate Scholarship

image courtesy of Syracuse University News

Xinyi Zhou, current student

PhD Candidate, Electrical Engineering and Information Science
researcher in machine learning and social computing

Syracuse Womxn in STEM Showcase

image courtesy of Rhiannon Abrams

the current treasurer of the Indigenous Students at Syracuse is a health & exercise science major

she wants to become a physical therapist, and will soon be studying how humans adjust to altitude at Mount Everest's base camp

Rhiannon Abrams, Class of 2021

BS, Health & Exercise Science
founder of the Indigenous Beading Club at Syracuse


150 YEARS OF IMPACT