



FEMALES – Female Legends of Science – E-BOOK

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Introduction

The main scope of this e-book is to reveal the role of women in STEM in order to support gender equality in this field, propose Role models for young girls and open new opportunities for them.

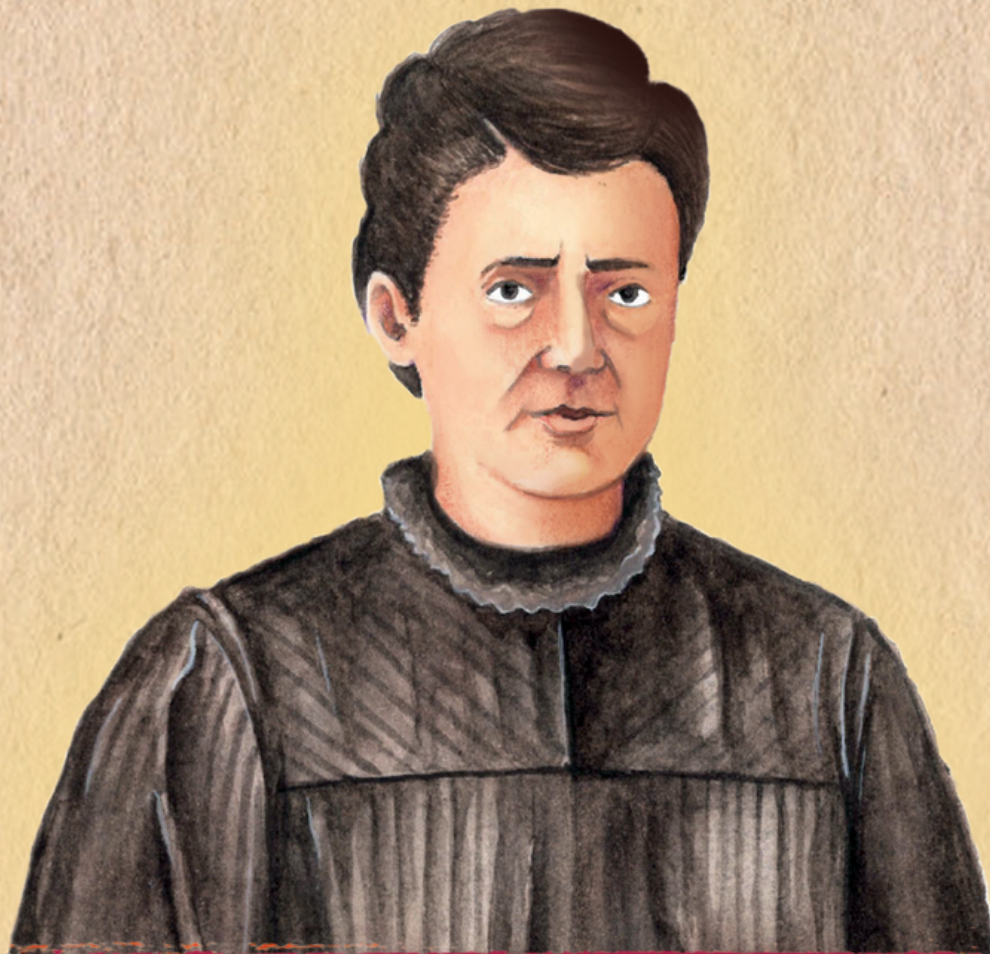
In an initial survey conducted by the partners, we discovered that 87% of students aged 11-18 cannot recall more than 2 famous women in the field of STEM (science, technology, engineering, mathematics) throughout the history. However they could recall several men scientist like Aristotle, Galileo, Newton, Einstein and many more. This stereotype continues to exist even in new technologies like space engineering, computing and information technology, given that the most famous innovations in this area were accomplished by males. Subsequently, it is no surprise that people associate STEM fields of work and education with men.

This e-book is a tool for Role model education, a term that was created by Robert K. Merton in the 21st century. The main aim of Role model education is to expose the target group to specific attitudes, lifestyles, and views. Role model education is becoming more and more popular because it fills the gap between ideal and reality.

In this e-book the teachers as well as the students can get inspired by the life and work of 51 important women in the field of STEM from partners' countries and Europe. For each woman they can read about:

- Basic information: Name, Country, Date of birth, Main field of work, Quote
- Education
- Academic career
- Awards
- Main contribution
- Women in Science
- Links

The material of this e-book is also connected to the game "FEMALES", some of the activities of the "E-book with Experiential activities" and the "Resources" which are developed under the Erasmus+ project "FEMALES". All these tools work together through the Role model education approach for the empowerment of young girls in STEM



*“One never notices
what has been done:
one can only see what
remains to be done”*

MARIE CURIE

Radioactivity

Poland • 1867 - 1934

Education

When she was ten years old, Maria began attending a boarding school. Next, she attended a gymnasium for girls, from which she graduated in 1883 with a gold medal. Unable to enroll in a regular institution of higher education because she was a woman, she and her sister Bronisława became involved with the clandestine Flying University, a Polish patriotic institution of higher learning that admitted women students. She spent a lot of time studying science alone. She followed her elder sister Bronisława to study in Paris and in 1891 she enrolled at the University of Paris, where she earned her higher degrees in physics and conducted her subsequent scientific work.



MARIE CURIE

Awards

Marie Curie was the first woman to be awarded a Nobel Prize, in Physics (1903), and with her later win, in Chemistry (1911), she became the first person to win Nobel honors twice and the only person to receive them in two different scientific fields.



She has received numerous other awards such as Devy Medal (1903), Matteucci Medal (1904), Elliott Cresson Medal (1909), Albert Medal (1910), Willard Gibbs Award (1921), Cameron Prize for Therapeutics of the University of Edinburgh (1931).

In 1995, she became the first woman to be entombed on her own merits in the Panthéon in Paris.

Academic career

She lived in an era when it was very difficult for women to study, let alone following an academic career. However, her passion for science, experimenting and her dedication to her work on radioactivity together with the fruitful collaboration with her husband Pierre Curie led her in 1903 to the success of discovering radioactive elements and being the first female Nobel Laureate. At the same year she received her PhD from the University of Paris, and 3 years later after her husband's death she became the first professor at the physics department of the University. She was also the first woman faculty member at the École Normale Supérieure in 1900. She also became head of Radium Institute which is now named after her.



Main contribution

She coined the term "radioactivity" and devoted her scientific career to it. Together with her husband Pierre, they discovered the radioactive elements polonium and radium while working with the mineral pitchblende. Between 1898 and 1902, the Curies published, jointly or separately, a total of 32 scientific papers, including one that announced that, when exposed to radium, diseased, tumour-forming cells were destroyed faster than healthy cells. Constantly active in establishing research labs, she founded the Curie Institutes in Paris and in Warsaw, which remain major centres of medical research today. Less known is her humanitarian engagement: during World War I she developed mobile radiography units to provide X-ray services to field hospitals together with her daughter Irene who also later received the Nobel Prize.



MARIE CURIE

Links



Biography
of Marie Curie

<https://www.biography.com/scientist/marie-curie>

Short video of life of Marie Curie
<https://www.youtube.com/watch?v=aowghaUvP6Q>

Short video of life of Marie Curie
https://www.youtube.com/watch?v=w6JFRi0Qm_s

Documentary for Marie Curie
<https://www.youtube.com/watch?v=PeVaEPFFNYc>

Woman in Science

After finishing school, she was unable to enroll at a university because she was a woman. In 1900, Curie became the first woman faculty member at the École Normale Supérieure. In 1903, at the peak of their career, the Curies were invited to the Royal Institution in London to give a speech on radioactivity; being a woman, she was prevented from speaking, and Pierre Curie alone was allowed to. The same year, at first the Nobel Prize committee had intended to honour only Pierre Curie and Henri Becquerel for radioactivity, and after Pierre's complaint, Marie's name was added to the nomination. She thus became the first woman to be awarded a Nobel Prize. After Pierre's death she was the first woman to become professor at the University of Paris. Remembered as a leading figure in science and a role model for women in science, she has received numerous posthumous honors.





*“Science and
everyday life cannot
and should not be
separated.”*

ROSALIND FRANKLIN

Chemist and X-ray crystallographer

Britain • 25 July 1920 – 16 April 1958

Education

Rosalind was educated at Norland Place, a private day school in West London, Lindores School for Young Ladies, a boarding school in Sussex, and St Paul's Girls' School in London. Then she studied the Natural Sciences Tripos at Newnham College, Cambridge, from which she graduated in 1941. Earning a research fellowship, she joined the University of Cambridge physical chemistry laboratory under Ronald George Wreyford Norrish. The British Coal Utilisation Research Association (BCURA) offered her a research position in 1942 and started her work on coals. This helped her earn a Ph.D. in 1945 in physical chemistry from Cambridge University.



Academic career

She went to Paris in 1947 as a chercheur (postdoctoral researcher) under Jacques Mering at the Laboratoire Central des Services Chimiques de l'Etat, where she became an accomplished X-ray crystallographer. She became a research associate at King's College London in 1951 and worked on X-ray diffraction studies, which would eventually facilitate the discovery of the double helix structure of DNA. In 1953, after two years, owing to disagreement with her director John Randall and more so with her colleague Maurice Wilkins, she was compelled to move to Birkbeck College. At Birkbeck, John Desmond Bernal, chair of the physics department, offered her a separate research team.



ROSALIND FRANKLIN

Awards

Her photos of DNA via X-ray crystallography were essential for the structure of the "molecule of life" for which Francis Crick, James Watson, and Maurice Wilkins shared the Nobel Prize in Physiology or Medicine in 1962. Watson suggested that Franklin would have ideally been awarded a Nobel Prize in Chemistry, along with Wilkins but, although there was not yet a rule against posthumous awards, the Nobel Committee generally did not make posthumous nominations. After finishing her work on DNA, Franklin led pioneering work at Birkbeck on the molecular structures of viruses. Her team member Aaron Klug continued her research, winning the Nobel Prize in Chemistry in 1982.



Main contribution

Her work on X-ray crystallography was central to the understanding of the molecular structures of DNA (deoxyribonucleic acid), RNA (ribonucleic acid), viruses, coal, and graphite. Although her works on coal and viruses were appreciated in her lifetime, her contributions to the discovery of the structure of DNA were largely recognised posthumously. Franklin is now best known for her work on the X-ray diffraction images of DNA, particularly Photo 51 which led to the discovery of the DNA double helix.



ROSALIND FRANKLIN

Links



Biography
of Rosalind Franklin

<https://profiles.nlm.nih.gov/spotlight/kr/feature/biographical>

Short video for Rosalind Franklin

<https://www.youtube.com/watch?v=BIP0IYrdirl>

Documentary for Rosalind Franklin

<https://www.youtube.com/watch?v=vISENaTR3NI>

Woman in Science

There is a lot of controversy about Rosalind's confrontation with sexism in science especially from close men colleagues which also led to lack of recognition of her outstanding contribution in the discovery of DNA structure. After lots of fights at King's college, she found shelter at Birkbeck physics department chair John Desmond Bernal, a crystallographer who was a communist, known for promoting women scientists and who offered her support and her first team she led. In the fall of 1956, Franklin discovered that she had ovarian cancer. She continued working throughout the following two years, despite having three operations and experimental chemotherapy. She died at 37.





*“Imagination is the
Discovering Faculty,
pre-eminently. It is
that which penetrates
into the unseen
worlds around us, the
worlds of Science.”*

ADA LOVELACE

Algorithms

Britain • 10 December 1815 – 27 November 1852

Education

Ada was the daughter of Lord Byron but lived all her life away from him. She was paralyzed after a bout of measles. She was subjected to continuous bed rest for nearly a year. By 1831, she was able to walk with crutches. Despite the illnesses, she developed her mathematical and technological skills. She was privately educated in mathematics and science by Mary Somerville, the noted female 19th-century researcher and scientific author. One of her later tutors was the mathematician and logician Augustus De Morgan. From 1832, when she was seventeen, her mathematical abilities began to emerge, and her interest in mathematics dominated the majority of her adult life.



Academic career

Living in the early 19th century and as a daughter of a noble family of the poet Lord Byron, Ada did not have an academic career in the contemporary sense. Nevertheless, her educational and social exploits brought her into contact with scientists such as Andrew Crosse, Charles Babbage, Sir David Brewster, Charles Wheatstone, Michael Faraday and the author Charles Dickens. In particular her tutor and lifelong friend Mary Somerville introduced her to Charles Babbage, who is known as “the father of computers”, who appreciated her talent and they had a collaboration with respect to his Analytical Engine.



ADA LOVELACE

Awards

Ada Lovelace did not win any awards during her lifetime. In fact, her contributions were largely ignored until the 1950s. Nevertheless there is a lot of posthumous commemoration of her contribution. To mention only the most important there is the ADA programming language named after her, an Ada Lovelace Award by the Association for Women in Computing and a “Lovelace Medal” given by the British Computer Society.



Main contribution

She is chiefly known for her work on Charles Babbage's proposed mechanical general-purpose computer, the Analytical Engine. She was the first to recognize that the machine had applications beyond pure calculation, and to have published the first algorithm intended to be carried out by such a machine. As a result, she is often regarded as the first to recognise the full potential of computers and one of the first computer programmers. She often questioned basic assumptions by integrating poetry and science. In 1844 she commented to a friend about her desire to create a mathematical model for how the brain gives rise to thoughts and nerves to feelings and in this way is the first pioneer of artificial intelligence.



ADA LOVELACE

Links



Biography
of Ada Lovelace

<https://www.youtube.com/watch?v=J7ITqnEmf-g>

Short video for Ada Lovelace

<https://www.youtube.com/watch?v=J7ITqnEmf-g>

Documentary on Ada Lovelace

<https://www.youtube.com/watch?v=QgUVrzkQgds>

Woman in Science

Her mother remained bitter after the divorce with Lord Byron, and promoted Ada's interest in mathematics and logic in an effort to prevent her from developing her father's perceived insanity. Her mindset of "poetical science" led her to ask questions about the Analytical Engine as shown in her famous notes examining how individuals and society relate to technology as a collaborative tool. Ada's health suffered seriously throughout her life and she died from uterine cancer at the age of 36.





*“My father said,
Don't grow up to be a
woman, and what he
meant by that was, a
housewife ... without
any interests.”*

MARIA GOEPPERT MAYER

Physics

Germany • 28 June 1906 – 20 February 1972

Education

Maria was educated at the Höhere Technische in Göttingen, a school for middle-class girls who aspired to higher education. In 1921, she entered the Frauenstudium, a private high school run by suffragettes that aimed to prepare girls for university. She took the abitur, the university entrance examination, at age 17, a year early, with three or four girls from her school and thirty boys. All the girls passed, but only one of the boys did. In the spring of 1924 she enrolled at the University at Göttingen, where the legendary female mathematician Emmy Noether was a professor, with the intention of becoming a mathematician. But soon she found herself more attracted to physics and did her PhD thesis in 1930 about 2-photon absorption. This was the time when quantum mechanics was young and exciting.



Academic career

In 1930 she married Joseph Mayer, an American Rockefeller fellow and went with him to the Johns Hopkins University in Baltimore US, where he had been offered a position. Strict rules against nepotism prevented the university from hiring Maria as a faculty member. She was given a job as an assistant in the Physics Department working with German correspondence, for which she received a very small salary, a place to work and access to the facilities. Similar situation she faced at Columbia and Chicago University. She was involved at the Manhattan project. Only 30 years later she was appointed full professor of physics at the University of California, San Diego. Although she suffered from a stroke shortly after arriving there, she continued to teach and conduct research for a number of years.



MARIA GOEPPERT MAYER

Awards

She won a Nobel prize in 1963 for proposing the nuclear shell model of the atomic nucleus. She was the second woman to win a Nobel Prize in physics after Marie Curie. She was elected a Fellow of the American Academy of Arts and Sciences and received the Golden Plate Award of the American Academy of Achievement in 1965. After her death, the Maria Goeppert Mayer Award was created by the American Physical Society (APS) to honor young female physicists at the beginning of their careers.



Main contribution

Her doctoral thesis was on the theory of possible two-photon absorption by atoms. The experimental verification of her hypothesis was made possible much later with development of the laser. Today, the unit for the two-photon absorption cross section is named the GM unit after her. With Max Born, her PhD examiner, she co-authored important works on the lattice dynamics of crystals. She also published a landmark paper on double beta decay. During WWII, she worked for the Manhattan Project at Columbia on isotope separation, and at the Los Alamos Laboratory on the development of Edward Teller's "Super" bomb. In the late 1940s, she developed a mathematical model for the structure of nuclear shells, published in 1950. Her model explained why certain numbers of nucleons in an atomic nucleus result in particularly stable configurations. These numbers are what Eugene Wigner called magic numbers.



MARIA GOEPPERT MAYER

Links



Biography
of Maria Goeppert Mayer
<https://www.youtube.com/watch?v=ISla3dgAWAE>

Short video for Maria Goeppert
Mayer
<https://www.youtube.com/watch?v=NfkW5pPi3M>

Woman in Science

A shortage of women mathematics teachers for schools for girls led to an upsurge of women studying mathematics at a time of high unemployment. Emmy Noether the legendary female mathematician taught at the Göttingen University where she studied, but most female colleagues were only interested in qualifying for their teaching certificates. Strict rules against nepotism prevented Johns Hopkins University from hiring Maria as a faculty member since her husband was a professor there. Her husband took up a position at Columbia University, where the chairman of the Physics Department, arranged for Maria to have an office, but she received no salary. At the University of Chicago, Maria was only able to become a voluntary associate professor of physics at the school. When she took her first position in 1960 she suffered from a stroke but continued working as she has always done despite the problems.





*“We have to show
what women are
capable to do in
science”*

FRANÇOISE BARRÉ-SINOUSSE

Virology

France • Date of birth 30 July 1947

Education

During her vacations as a child, she would spend hours analyzing insects and animals, comparing their behaviors. After two years studying at the University of Paris, she attempted to find part-time work in a laboratory to ensure that she had made the right career choice. After nearly a year of searching for laboratory work, she was finally accepted by the Pasteur Institute in 1970. Her part-time work at the Pasteur Institute quickly became full-time. She began to only attend university to take the exams and had to rely on her friends' class notes because she was not regularly attending class. However, she was actually scoring higher on her exams than before because she finally had the motivation because she had realized a career in science was what she wanted to do.



Academic career

She was recruited as a volunteer in Jean-Claude Chermann who was studying the relationship between retroviruses and cancers in mice at the Institut Pasteur. He proposed to her a PhD project to study the antiretroviral activity of a synthetic molecule (HPA23) in leukaemia induced by Friend virus in mice. Tests proved effective and she was awarded her PhD in 1974. She also interned at the U.S. National Institutes of Health before returning to the Pasteur Institute and started her own lab in 1988. During the AIDS epidemic in the 1980s, her knowledge about retroviruses led her to discover HIV in 1983 as the origin of the disease for which she was awarded the Nobel Prize. She became a leading scientist but also consultant and leader of HIV related organizations like the International AIDS Society.



FRANÇOISE BARRÉ-SINOSSI

Awards

Barré-Sinoussi shared the 2008 Nobel Prize in Physiology or Medicine with Luc Montagnier for their co-discovery of HIV.



She has received numerous other awards including Sovac Prize, Körber European Science Prize, Prize of the French Academy of Sciences, King Faisal International Prize, International AIDS Society Prize.

Main contribution

She dedicated her career as a scientist and activist to halting the spread of AIDS. Her discovery of HIV led to blood tests that could find the infection, and ultimately to antiretroviral medications that have turned AIDS from a death sentence to a manageable chronic disease. Among her research contributions are studies of various aspects of the adaptive immune response to viral infection, the role of innate immune defences of the host in controlling HIV/AIDS, and factors involved in mother-to-child transmission. She has co-authored over 240 scientific publications, has participated in over 250 international conferences, and has trained many young researchers.



Woman in Science

Sinoussi admitted that she was more interested in becoming a doctor but at the time she was under the false impression that studying medicine was both more expensive and lengthier than a career in science. In an interview she mentions that a colleague has underestimated the role a woman can play in science, and this has been a motivation to her to show what women are capable of. In 2009, she wrote an open letter to Pope Benedict XVI in protest over his statements that condoms are at best ineffective in the AIDS crisis. In July 2012 she became President of the International AIDS Society.



FRANÇOISE BARRÉ-SINOUSI

Links



Biography of Françoise Barré-Sinoussi

<https://www.pasteur.fr/en/institut-pasteur/history/francoise-barre-sinoussi-born-1947>

Short video- Françoise Barré-Sinoussi

<https://www.youtube.com/watch?v=fN3V-vNA2GM>

Interview

https://www.youtube.com/watch?v=Kz-_daSSl4



“The difference between men and women is simply the Y chromosome, which has nothing to do with intelligence.”

CHRISTIANE NÜSSELEIN-VOLHARD

Developmental biology

Germany • Date of birth 20 October 1942

Education

She was interested in animals and plants from very early on, even before she went to school. She collected plants from the garden and she was fascinated by the collection of butterflies, and later she also joined a bird-watching club. She still loves looking at nature like this. She has a big garden and is very interested in gardening and wild flowers. She was educated at the University of Tübingen, started with biology, but finding it boring she turned into physics and then biochemistry where she eventually got her diploma. She earned a PhD in molecular biology in 1974 for research into Protein-DNA interactions and the binding of RNA polymerase in *Escherichia coli*.



Academic career

In her scientific career she was more interested in organismal biology. She went into developmental biology Alfred Gierer's group and worked on the question of morphogens. She wrote a proposal for an EMBO fellowship and ended up in Walter Gehring's lab working with *Drosophila*. She then became group leader at the EMBL, Heidelberg (1978-1981) working with Eric Wieschaus, and the FML of the Max-Planck-Gesellschaft in Tübingen (1981-1984). Since 1985 she has been Director of the Max Planck Institute for Developmental Biology in Tübingen and also leads its Genetics Department. Since 2001 she has been a member of the National Ethics Council of Germany for the ethical assessment of new developments in the life sciences and their influence on the individual and society.



CHRISTIANE NÜSSELEIN-VOLHARD

Awards



She won the Albert Lasker Award for Basic Medical Research in 1991 and the Nobel Prize in Physiology or Medicine in 1995, together with Eric Wieschaus and Edward B. Lewis, for their research on the genetic control of embryonic development.

In 1986, she received the Gottfried Wilhelm Leibniz Prize of the Deutsche Forschungsgemeinschaft, which is the highest honour awarded in German research.

Main contribution

The experiments that earned Christiane and Eric Wieschaus their Nobel prize aimed to identify genes involved in the development of *Drosophila melanogaster* (fruit fly) embryos. At this point (the late 1970s and early 1980s) little was known about the genetic and molecular mechanisms by which multicellular organisms develop from single cells to morphologically complex forms during embryogenesis. The study of mutants she has identified and their interactions led to important new insights into early *Drosophila* development, especially the mechanisms that underlie the step-wise development of body segments. These findings have important significance for organisms other than fruit flies.



Woman in Science

She states that for women in Germany, the big problem is they usually tend to interrupt and they are slowed down in their progress and they can't compete as much as they should with men who don't have to do that. In 2004 Nüsslein-Volhard started the Christiane Nüsslein-Volhard Foundation. It is meant to aid promising young female German scientists with children. The foundation's main focus is to facilitate childcare as a supplement to existing stipends and day care. As she states "It is important to teach women that it's okay to let people help you because you can't do everything yourself and you need to have some free time".



CHRISTIANE NÜSSELEIN-VOLHARD

Links



Biography of Christiane Nüsslein-Volhard

<https://www.nobelprize.org/womenwhochangedscience/stories/christiane-nusslein-volhard>

Interview

<https://www.youtube.com/watch?v=GmQ9ellvdGM>



“It is unfair, one should instead show that they are really equal by disclosing the inner ground for their equality.”

EMMY NOETHER

Abstract algebra and theoretical physics

Germany • 23 March 1882 - 14 April 1935

Education

Noether graduated from Höhere Töchter Schule in Erlangen. In 1900, she passed the examinations of the State of Bavaria that certified her to teach English and French at schools for women. Soon after becoming a language teacher, Noether decided to pursue Mathematics, which was then considered as a challenging path for a woman. She took Mathematics classes for two years from the University of Erlangen after obtaining permission from the German professors. She then joined the University of Erlangen for her Doctorate degree and in 1907 she was awarded a Phd in Mathematics.



EMMY NOETHER

Awards

Noether won the 1932 Alfred Ackermann-Teubner Memorial Prize for the Advancement of Mathematical Knowledge.



Academic career

From 1908 to 1915, she worked at the Mathematical Institute of Erlangen without pay and piloted her research there. Felix Klien and David Hilbert invited Noether to join the mathematics department at the University of Göttingen in 1915. Although she was criticized by many for working at the University, she lectured students for four years under Hilbert's name. She was given the title 'Privatdozent', which permitted her to lecture in 1919, but she was still not paid. In 1922, Noether became an associate professor receiving a menial salary for her service.



Main contribution

Noether proved two theorems that were important for elementary particle physics and general relativity. One of her theorems known as 'Noether's Theorem' is one of the most significant contributions in the development of modern physics. From 1920-1926, she concentrated on the theory of mathematical rings. She developed the abstract and conceptual approach to algebra, which resulted in several principles unifying topology, logic, geometry, algebra and linear algebra. Her works were a breakthrough in abstract algebra.



EMMY NOETHER

Links



Biography of Emmy Noether

<https://www.britannica.com/biography/Emmy-Noether>

Documentary for Emmy Noether

<https://www.youtube.com/watch?v=MxmDphojQUU>

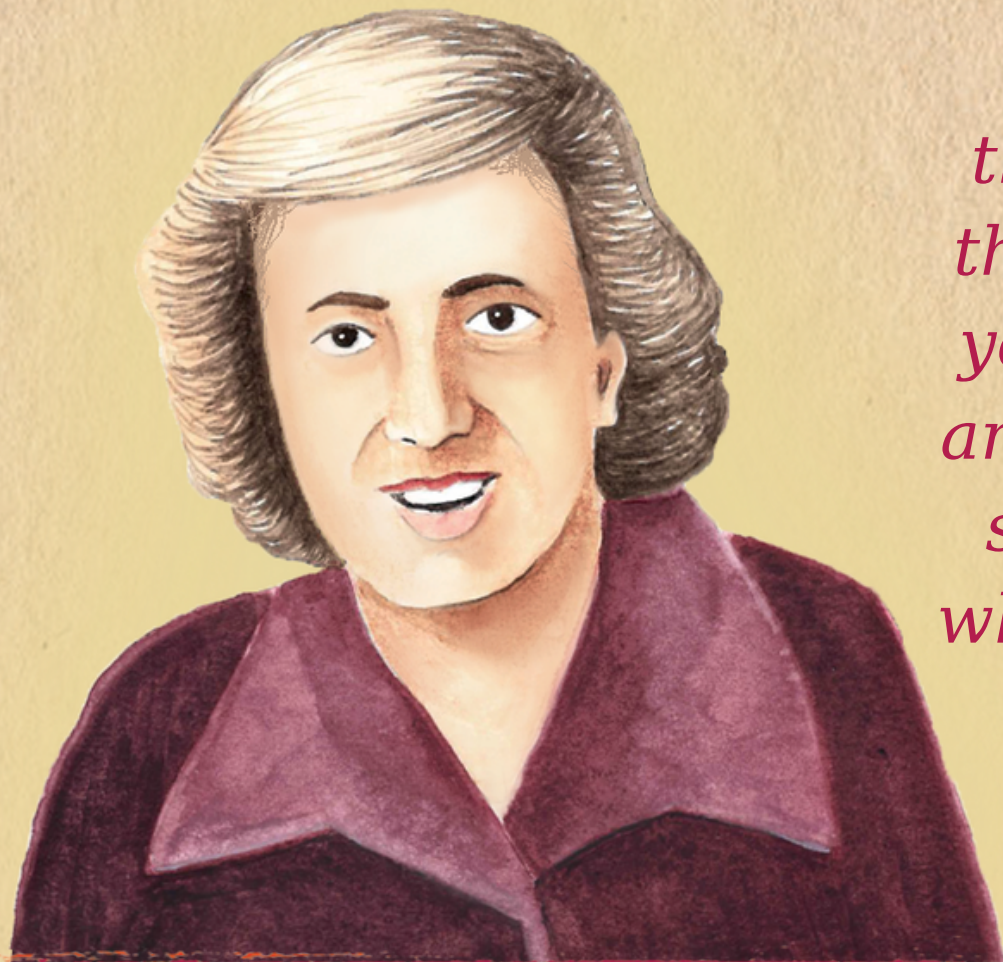
Short video of Emmy Noether

<https://www.youtube.com/watch?v=pLkPbBQnCZ4>

Woman in Science

Young Emmy was brought up as a typical girl of her era: helping with cooking and running the house – she admitted later she had little aptitude for these sorts of things. She also loved mathematics, but she knew that the rules of German society meant she would not be allowed to follow in her father's footsteps to become a university academic. Despite her brilliant works and knowledge, she was not given the status of a professor as she was a woman, a Jew and a social democrat. When the Nazis took over, she was unable to continue her profession in Germany and so, in 1933, she moved to the U.S and taught at the Bryn Mawr College in Pennsylvania as a guest professor. She was paid a full salary here and was accepted as a proper faculty member. She also taught at the Institute of Advanced Study at Princeton.





“There are two moments that are important. There's the moment when you know you can find out the answer and that's the period you are sleepless before you know what it is. When you've got it and know what it is, then you can rest easy.”

DOROTHY HODGKIN

Abstract algebra and theoretical physics

England • 12 May 1910 – 29 July 1994

Education

When she was attending Sir John Leman School in north Suffolk, England she was allowed to join the boys as they studied chemistry. By the end of her early schooling, she had already decided that chemistry was something she wanted to pursue. Aged 18, Dorothy started her chemistry degree at Somerville College, Oxford University, before moving to the University of Cambridge to earn her Doctorate.



Academic career

Hodgkin was given a research fellowship from Somerville College, Oxford in 1933. She was also Somerville's first fellow and tutor in chemistry, a position she held from 1936 to 1977. During this period, she tutored the late Prime Minister Margaret Thatcher, who was then Margaret Roberts. She spent most of the rest of her career at Somerville in research and education until she retired in 1977. While at Oxford, Hodgkin continued her research on x-ray crystallography. An important colleague during her career was John Desmond Bernal, an English physicist. Bernal was studying the structure of organic molecules, such as sterols and insulin, using crystallography, and Hodgkin was greatly influenced by him.



DOROTHY HODGKIN

Awards

In addition to the Nobel Prize for Chemistry in 1964 she became only the second woman to receive the Order of Merit, the first of which was given to Florence Nightingale.



She also became the first woman to receive the Copley medal and was a winner of the Lenin Peace Prize.

A Fellow of the Royal Society, Hodgkin also became Bristol University's Chancellor from 1970 to 1988.

She was given an Honorary Degree of Science from University of Bath in 1978.

Main contribution

In the late 1930s Dorothy became a leading practitioner of the use of X-ray crystallography in determining the three-dimensional structure of complex organic molecules. Insulin has transformed the lives of millions of diabetics around the world. Without her pioneering and patient efforts – over a period of some 35 years – to decipher this crucial hormone's structure, its full potential may still not have been realised. All this was made possible by Crowfoot's co-discovery and development of X-ray crystallography as a critical method for studying natural molecules.



DOROTHY HODGKIN

Links



Biography of Dorothy Hodgkin
<https://www.nobelprize.org/prizes/chemistry/1964/hodgkin/biographical/>

Short video

<https://www.youtube.com/watch?v=1LitdoIAJ0k>

Interview

<https://www.youtube.com/watch?v=XFH8DzB0iIo>

Woman in Science

Dorothy Hodgkin was diagnosed with rheumatoid arthritis after experiencing pain in her hands for a period of time. Although she eventually spent a lot of time in a wheelchair, this did not stop her from pursuing her passion and she continued her research work.





“For a research worker the unforgotten moments of his life are those rare ones which come after years of plodding work, when the veil over nature's secret seems suddenly to lift & when what was dark & chaotic appears in a clear & beautiful light & pattern.”

GERTY CORI

Medicine, biochemist

Austria-Hungary • 15 August 1896 – 26 October 1957

Education

She received her primary education at home before entering a Lyceum for girls in 1906; she graduated in 1912 and studied for the University entrance examination, which she took and passed at the Tetschen Realgymnasium in 1914. She entered the Medical School of the German University of Prague and received the Doctorate in Medicine in 1920.



Academic career

After receiving her Doctorate she spent two years at the Carolinen Children's Hospital before emigrating to America with her husband, Carl, whom she married in 1920. They worked together in Buffalo and when he moved to St. Louis, she joined him as Research Associate. Gerty Cori was made Professor of Biochemistry in 1947.



GERTY CORI

Awards

In 1947, the Coris earned the Nobel Prize for Physiology and Medicine "for their discovery of the course of the catalytic conversion of glycogen."



On the heels of her worldwide recognition, the University would finally place her in the position of full professor.

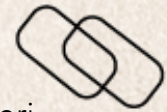
Main contribution

Gerty uncovered the process of cellular energy storage and release, answering one of the most fundamental questions about how the human body works. In doing so, she and her husband and lifelong research partner, Carl, transformed the study of biology, proving that the clarity of molecular chemistry could and should be applied to the opaque mechanisms of biology.



GERTY CORI

Links



Biography of Gerty Cori

<https://www.nobelprize.org/prizes/medicine/1947/cori-gt/biographical/>

Short video

https://www.youtube.com/watch?v=d9jG0_nhr18

Woman in Science

Gerty Cori was one of few women to enter the Medical School of the German University of Prague. She met husband Carl in her first year and after graduation, the couple moved to Vienna and married. While Carl was afforded the opportunity to work at the University of Vienna's medical clinic and Pharmacological Institute, Gerty could only work as assistant at the Karolinen Children's hospital because of her gender.





“In fact men will fight for a superstition quite as quickly as for a living truth - often more so, since a superstition is so intangible you cannot get at it to refute it, but truth is a point of view, and so is changeable.”

HYPATIA

Math, astronomy, philosophy

Alexandria, Hellenic ancient city • c. 355 CE - March 415

Education

Most historians believe that Hypatia surpassed her father's knowledge at a young age. However, while Hypatia was still under her father's discipline, he also developed for her a physical routine to ensure for her a healthy body as well as a highly functional mind. In her education, Theon instructed Hypatia on the different religions of the world and taught her how to influence people with the power of words. He taught her the fundamentals of teaching, so that Hypatia became a profound orator. People from other cities came to study and learn from her.



HYPATIA

Awards

There were no academic or scientific awards at her time.



Academic career

In her times there was no notion of university or academic career in the contemporary sense. She was the leader of the Neoplatonist school of philosophy in Alexandria. Hypatia was renowned in her own lifetime as a great teacher and a wise counselor.



Main contribution

Hypatia's studies included astronomy, astrology, and mathematics. References in letters by Synesius, one of Hypatia's students, credit Hypatia with the invention of the astrolabe, a device used in studying astronomy. Hypatia was known more for the work she did in mathematics than in astronomy, primarily for her work on the ideas of conic sections introduced by Apollonius. She edited the work *On the Conics* of Apollonius, which divided cones into different parts by a plane. This concept developed the ideas of hyperbolas, parabolas, and ellipses. With Hypatia's work on this important book, she made the concepts easier to understand, thus making the work survive through many centuries.



Woman in Science

Hypatia is famous for being the greatest mathematician and astronomer of her time, for being the leader of the Neoplatonist school of philosophy in Alexandria, for spectacularly overcoming the profound sexism of her society, and for suffering a violent death at the hands of ignorant zealots. Hypatia was the first woman to have such a profound impact on the survival of early thought in mathematics.



Links



Biography of Hypatia

<https://www.britannica.com/biography/Hypatia>

Short video

<https://www.youtube.com/watch?v=jArSoZEMtZ4>



“My work "On the Diseases and cures of women" consists of 63 chapters and is widely used till today.”

METRODORA

Medicine, physician, gynecology

Greece • 200-400 CE

Education

Nothing is known of Metrodora's identity beyond her name. She is nevertheless obviously influenced by the work of Hippocrates, the founder of medicine.



METRODORA

Awards

There were no academic or scientific awards at her time.



Academic career

In her times there was no notion of university or academic career in the contemporary sense.



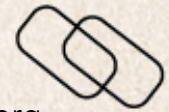
Main contribution

She authored "On the Diseases and Cures of Women", the oldest medical textbook written by a woman. It covers various areas of medicine including gynecology and women's hygiene. Her book was referenced by many medical writers in both ancient Greece and Rome. Metrodora was decisive about controversial topics involving symptomology and etiology; inflammation of the uterus is one example. She made her own unique contributions to advancing medical understanding of theory and etiology. Although female physicians were active in gynecology and obstetrics in ancient Greece and Rome, it was rare that women physicians practiced in other areas of medicine. Childbirth and obstetrics in antiquity were viewed as acceptable areas of medical practice for women who were able to gain medical training as physicians, in large part because of the ancient tradition of midwifery and its association with women trained by other women. Metrodora writes on many areas of medicine in her book, including all aspects of gynecology, but obstetrics is not dealt with in the volumes that are extant.



METRODORA

Links



Biography of Metrodora

<https://www.targethealth.com/ost/metrodora-physician-practiced-around-200-400-ce>

Role playing short video on life of Metrodora

<https://www.youtube.com/watch?v=Yryxr0Bvm3Q&t=26s>

Woman in Science

Metrodora is known to be the first female medical writer and was influenced by the works of Hippocrates. Her medical treatise covers many areas of medicine, including gynecology, but not obstetrics. It was widely referenced by other medical writers in ancient Greece and Rome, and was also translated and published in Medieval Europe. Nothing is known of Metrodora's identity beyond her name. However, several women physicians are known to have existed in the ancient Greco-Roman world, and she is generally regarded as the first female medical writer.





*“There are no
miracles; only
results of hard
work”*

MARIA PETROU

Artificial intelligence, machine vision

Greece • 17 May 1953 - 15 October 2012

Education

Maria was born in Thessaloniki in 1953 and showed skills related to science from an early age. She began teaching Mathematics and Science to children at the age of 15. She studied physics at the Aristotle University of Thessaloniki. At the entrance tests of the university she obtained the top mark amongst 4000 candidates for all Science and Engineering Departments in Greece. She went on to do the Part III, Mathematical Tripos at the University of Cambridge in 1977, continuing there to obtain a Ph.D. in Astronomy in 1981. Until the age of 12 Maria had wanted to be an Astronaut, so clearly she settled for an Astronomer instead!



MARIA PETROU

Awards

She received numerous honours, including a fellowship of the Royal Academy of Engineering in 2004.



The British Machine Vision Association and Society for Pattern Recognition has awarded her a Distinguished Fellowship.

Academic career

Following academic posts at the Kapodistrian University of Athens and at the University of Oxford and Reading, Maria then spent 17 years at the University of Surrey, from Lecturer through to Professor. After a distinguished career at University of Surrey, she joined the Department of Electrical and Electronic Engineering at Imperial College in London UK in 2005. In 2009, she became the Director of the Informatics and Telematics Institute of CERTH in Thessaloniki Greece while retaining as part time her chair at Imperial College. In addition to being a distinguished researcher, she was also known as a very active member of the IAPR Community. She held many positions in the IAPR including Editor of the Newsletter, Treasurer of the Executive Committee and member of standing and technical committees.



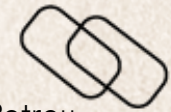
Main contribution

Maria describes herself as a Physicist by training, an Engineer by profession and a Mathematician at heart. She was known for her discovery of the "trace transformation". This was a powerful technique used to encode essential information in an image, regardless of scaling or rotations, and it has had important practical benefits, for example in the development of face-recognition systems. She also developed sophisticated "segmentation" procedures for sharply identifying edges and delineating simple shapes within a fuzzy image. She has supervised 36 PhD theses to successful completion and she has examined nearly 100.



MARIA PETROU

Links



Biography of Maria Petrou
<https://www.commsp.ee.ic.ac.uk/~mcpetrou/>

Woman in Science

An unfailing advocate for women in engineering, she was active in organisations such as Women in Science and Engineering and the Women's Engineering Society. She was also an amateur cartoonist, and once challenged her colleagues to construct a robot capable of ironing clothes – from an idea initiated by her aunt– a challenge that later developed into a European Union-funded robotics project. She died from cancer at the age of 59.





“A support system is essential if we want to retain and mentor and help the women in our department reach their potential”

ELENI STROULIA

Artificial intelligence, social computing

Greece • Date of birth 1966

Education

Stroulia was born in Larissa, and graduated from the University of Patras in 1989. She completed her Ph.D. at the Georgia Institute of Technology in 1994.



ELENI STROULIA

Awards

In 2011, the Smart-Condo team received the UofA Teaching Unit Award.



In 2018 she received a McCalla professorship, and in 2019 she was recognized with a Killam Award for Excellence in Mentoring.

Academic career

She has played leadership roles in the GRAND and AGE-WELL NCEs. She has supervised more than 60 graduate students and PhDs, who have gone forward to stellar academic and industrial careers. Since January 2020, she is the Director of the AI4Society Signature Area. She held the NSERC/AITF Industrial Research Chair in Service Systems Management from 2010 to 2016.



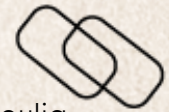
Main contribution

Her research focuses on addressing industry-driven problems, adopting AI and machine-learning methods to improve or automate tasks. Her flagship project in the area of healthcare is the Smart Condo in which she investigates the use of technology to support people with chronic conditions live independently longer and to educate health-science students to provide better care for these clients. Her research has included work on algorithms recognizing depression from recordings of people's voices, and the use of virtual reality to assist older people with in-home exercise. She is also associated with the Far-Play project for augmented reality research at the University of Alberta.



ELENI STROULIA

Links



Biography of Eleni Stroulia

https://en.wikipedia.org/wiki/Eleni_Stroulia

Article on women in coding

<https://www.ualberta.ca/science/about-us/contours/2016-fall-contours/2016/october/i-am-woman-hear-me-code.html>

Woman in Science

At the University of Alberta, she helped found Ada's Team, a support group for women and people from other disadvantaged groups among computing students. According to her: "There is still a lot to be done to encourage women first, to pursue these careers and second, to not drop out when they find themselves in a minority group in their classes. Loneliness is dangerous, especially in the face of adversity, and a support system is essential if we want to retain and mentor and help the women in our department reach their potential," she says. "Everyone needs a support group, and it is difficult to form one when you feel unlike everyone else around you. It is easy, then, to think that the reason why you are facing difficulties is because you are not 'meant' to be in the program."





“AI powered systems have the potential to drastically improve our lives, but also to significant harm it if they are not vetted for bias and fairness”

GEORGIA GINA TOURASSI

Biomedical informatics, artificial intelligence

Greece • Date of birth 1964

Education

Tourassi studied physics at Aristotle University of Thessaloniki and graduated in 1987. She moved to Duke University for her doctoral studies, and earned a PhD in 1993.



GEORGIA GINA TOURASSI

Awards



She has received numerous awards among others:

2015 Fellow of the American Institute for Medical and Biological Engineering,

2016 United States Department of Energy Secretary's Appreciation Award,

2017 Fellow of the SPIE,

2018 Oak Ridge National Laboratory Director's Award.

2020 Chair of the SPIE Medical Imaging Conference

Academic career

In 1988, Tourassi was appointed a postdoctoral research assistant at Duke University and promoted to associate professor of medical physics at Duke University Medical Center in 2006. Tourassi joined Oak Ridge National Laboratory in 2011. She is the Founding Director of the Health Data Sciences Institute, where she manages the strategic agenda of the biomedical science and computing group. She has hosted a range of biomedical research conferences at the Oak Ridge National Laboratory.



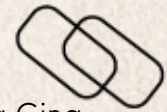
Main contribution

Her research was supported by the National Institutes of Health (NIH) and the Whitaker Foundation. Her work uses big health data, in particular for epidemiology of cancer. This includes the use of artificial intelligence in nuclear medicine, as well as computer-aided diagnosis (CAD) in breast cancer screening. Her CAD system is interactive, knowledge based and uses information theory. She has also developed indexing systems to speed-up image analysis, techniques to monitor the reliability of CAD and advanced computational intelligence techniques, including genetic algorithms.



GEORGIA GINA TOURASSI

Links



Biography of Georgia Gina Tourassi

<https://www.ornl.gov/staff-profile/georgia-tourassi>

Short video

<https://www.youtube.com/watch?v=9tdpK2kXScE>

Woman in Science

Tourassi is an advocate for women and minorities in science and engineering. She is involved with the Oak Ridge National Laboratory women's mentorship program. She is involved with the women's mentorship program at ORNL and regularly mentors students through the Department of Energy scholarship programs. The majority of her mentees have pursued advanced degrees, and successful careers and leadership positions in academia and industry, which she considers one of her greatest accomplishments. She is a member of The Bredesen Centre.





*“It is always
a challenge to be
one of the few”*

EFSTRATIA KALFAGIANNI

Math, quantum topology

Greece • Date of birth 1965

Education

She became interested in mathematics in high school where she took her first lessons in Euclidean geometry and number theory. Her teachers encouraged her to continue her studies in mathematics. She graduated from the Aristotle University of Thessaloniki in October 1987. She received her master's degree in 1990 from Fordham University and continued her doctoral studies at Columbia University, where she received her second master's degree in 1991 and her doctorate in 1995.



Academic career

After a postdoctoral fellowship at the Institute for Advanced Study and three years as an Associate Professor at Rutgers University, she moved to the University of Michigan in 1998. She became a full professor in 2008 and received the MSU William J. Beal Outstanding Faculty Award in 2019.



EFSTRATIA KALFAGIANNI

Awards

Kalfagianni was a member at the Institute for Advanced Study in 1994–1995 in 2004–2005 and in the Fall term of 2019.



She was included in the 2019 class of fellows of the American Mathematical Society "for contributions to knot theory and 3-dimensional topology, and for mentoring".

Main contribution

Kalfagianni works in knot theory, three-manifolds, hyperbolic geometry, quantum topology and the interplay of these fields. Kalfagianni is an editor for the New York Journal of Mathematics. She was also one of the editors of the book Interactions Between Hyperbolic Geometry, Quantum Topology and Number Theory.



EFSTRATIA KALFAGIANNI

Links



Efstratia Kalfagianni biography and research

<https://users.math.msu.edu/users/kalfagia/>

Article

<https://msutoday.msu.edu/news/2019/2019-william-j-beal-outstanding-faculty-awards>

Woman in Science

Kalfagianni is an outstanding mentor of young talent, having supervised many PhD students and postdoctoral fellows who have gone on to research positions at major universities or in industry. She focuses on the professional and emotional growth of her students or fellows.





“I am working on a problem which fascinates me but I keep failing to do what I try. Still there is an end even to failures.”

AMALIA FLEMING

Medicine, bacterology

Greece • June 28, 1912 - February 26, 1986

Education

She studied medicine at the University of Athens , where she was awarded a doctorate , and continued her studies in Paris (where she worked at the Necker Hospital), and in London.



Academic career

During the occupation she participated in the National Resistance . On a scholarship from the British Council she went to London in 1945 where she worked at the Wright Fleming Institute alongside Nobel Laureate microbiologist Alexander Fleming until 1949, when she returned to Greece to take over the direction of the Evangelism.



AMALIA FLEMING

Awards

Amalia Fleming was also President of the Association of Greek Scientists (SEE)



In 1965 was honoured with the Order of Eupoia.

She also received the Greek Royal Order of Welfare award.

Main contribution

Fleming saw herself as a Greek patriot and a defender of democracy and independence, stating: "I was born a Greek and this is an incurable disease that nothing and no one can treat or change". After her death, the Greek government lamented her loss and praised her as "a great humanitarian, a fine democrat and a fighter for the Socialist cause". She established the Greek Foundation for Basic Biological Research "Alexander Fleming" and "created the conditions to set up" the Biomedical Sciences Research Centre "Alexander Fleming" (often referred to as BSRC "Alexander Fleming" and the Alexander Fleming Biomedical Sciences Research Center), in Vari, a suburb of Athens. In 1986 a hospital was founded at Melissia, a suburb of Athens, and named after her (currently known as Sismanogleio-Amalia Fleming General Hospital).



AMALIA FLEMING

Links



Biography of Amalia Fleming

<https://www.encyclopedia.com/women/encyclopedias-almanacs-transcripts-and-maps/fleming-amalia-1912-1986>

Documentary

<https://www.youtube.com/watch?v=WLNJqtHfW-k>

Woman in Science

During the dictatorship he developed intense anti-dictatorship activity and was arrested in August 1971, on charges that he was planning the escape of Aleko Panagoulis . After twenty-five days of interrogation, during which he was tortured, tried and convicted by the extraordinary military court of Athens.





“It might be easier to protect someone from developing a mental disorder rather than trying to correct abnormalities.”

SOPHIA FRANGKOU

Psychiatry

Greece • Day of birth 1965

Education

Sophia graduated from the Medical School of the University of Athens, Greece in 1989. She then moved to the UK where she trained in psychiatry at the Maudsley Hospital, London. She obtained her master's degree in Neuroscience from the University of London, UK and trained in the US as a research fellow at the Department of Psychiatry and Behavioural Sciences at the Johns Hopkins University. She returned to the Institute of Psychiatry, King's College London where she completed her PhD on neuroimaging and electrophysiological markers of familial vulnerability to schizophrenia.



SOPHIA FRANGKOU

Awards

She has served as vice-president for the International Society for Bipolar Disorders and is currently vice-chair of the Pan-american division of the Royal College of Psychiatrists.



Academic career

Dr. Frangou is editor-in-chief of "European Psychiatry", the official Journal of the European Psychiatric Association, and associate editor of "Human Brain Mapping". She is a Fellow of the Royal College of Psychiatrists, the American Psychiatric Association and of the European Psychiatric Association (EPA). She has served on the Council of the British Association for Psychopharmacology (BAP). Between 1997 and 2013 she worked as a Consultant Psychiatrist at the Maudsley Hospital and led her own research group at the Institute of Psychiatry, Psychology and Neuroscience, King's College London. She is Professor of Psychiatry at the Icahn School of Medicine at Mount Sinai where she heads the Psychosis Research Program.



Main contribution

Her research focuses on the pathophysiological processes underlying psychosis, with emphasis on schizophrenia and bipolar disorder using clinical, genetic, cognitive and neuroimaging techniques. Her key contributions in the field relate to the neuroimaging correlates of disease risk, expression and resilience and on the functional impact of susceptibility genes for schizophrenia and bipolar disorder on brain structure, connectivity and plasticity. In parallel she is also interested in the standardisation of neuroimaging measures to capture normal variation across the lifespan and to guide diagnosis, prognosis and treatment response. She currently co-chairs the ENIGMA Lifespan Working Group that examines normal variation in brain structure in over 10,000 healthy people aged 2–92 years. She co-authored the BAP guidelines for the treatment of Bipolar Disorder and is currently Expert Reviewer for the Working Group on the Classification of Mood and Anxiety Disorders for the Revision of ICD-10 Mental and Behavioural Disorders.



SOPHIA FRANGKOU

Links



Biography of Sophia Frangkou
<https://psychiatry.ubc.ca/person/sophia-frangou/>

Short video-interview
<https://www.youtube.com/watch?v=AtgQ9Vgb-Is>

Woman in Science

She is co-author of the book “Women in Academic Psychiatry” which includes sixteen first-person narratives from some of the most influential women in psychiatry about why they went into the field, what they attribute to success, and how they overcome their challenges. The second part of this text analyzes the themes brought to light in the narrative and discusses strategies for success. Though several of the chapters target issues that women in academic psychiatry may not have a resource for, several of the chapters discuss challenges that both men and women face, including strategic actions and decisions and the time investment necessary for a successful career in academic psychiatry. The topics are relevant to medical professionals at every level of their career who are or work with women in the field. Women in Academic Psychiatry is a unique resource for the professional woman in psychiatry, psychology, medical school, for men who face particular career challenges in academic medicine or are cultivating young women who are eager to succeed.





“It was not easy to study medicine for me and my young girlfriends who grew up in my time. If I come back to life I would do the same and I be happy as a doctor.”

MÜFIDE KÜLEY

Medicine

Turkey • 1899 or 1904 – 26 December 1995

Education

She was born in Greek Island Chios in 1899 or 1904. After graduating from Çamlıca Girls High School in Istanbul, she continued her education at the Faculty of Science, Biology Department of Darülfünunu University, since women were not admitted to the Faculty of Medicine. She also continued in the Chemistry department. Nevertheless, she wanted to move to the Faculty of Medicine and finally after a lot of struggles she succeeded enrolling in 1922 and became one of the first female doctors of the Republic of Turkey.



MÜFİDE KÜLEY

Awards

In 1993 he was awarded an honorary doctor degree by Istanbul University.



She served as the general secretary of the Turkish Medical Association.

Academic career

During her medical education, she worked as a "Compulsory Science Education" at Üsküdar Girls Art School with the status of "compulsory civil service". In 1929 she quit teaching and became an assistant at the Second Internal Medicine Clinic at the Faculty of Medicine. A year later, she was promoted to Chief Physician in this clinic. In 1933, she won the title of "specialist" and opened an office in Kadıköy. She worked at the Istanbul Faculty of Medicine particularly Internal Medicine at the Clinic of Gastroenterology and she is the founder of the clinic. She served as the general secretary of the Turkish Medical Association in 1945 and as its president in 1961. She became the first female clinical professor in 1952.



Main contribution

She is one of the first female doctors of the Republic of Turkey. She founded the Clinic of Gastroenterology at the Istanbul Faculty of Medicine Internal Medicine. Her first article was published in the Medical Faculty Magazine with the signature of " Dr. Fatma Kâzım-Assistant". She wrote books with titles " Poisoning ", " Digestive System Diseases ", " Dietetic Treatment in Internal Diseases ".



MÜFİDE KÜLEY

Links



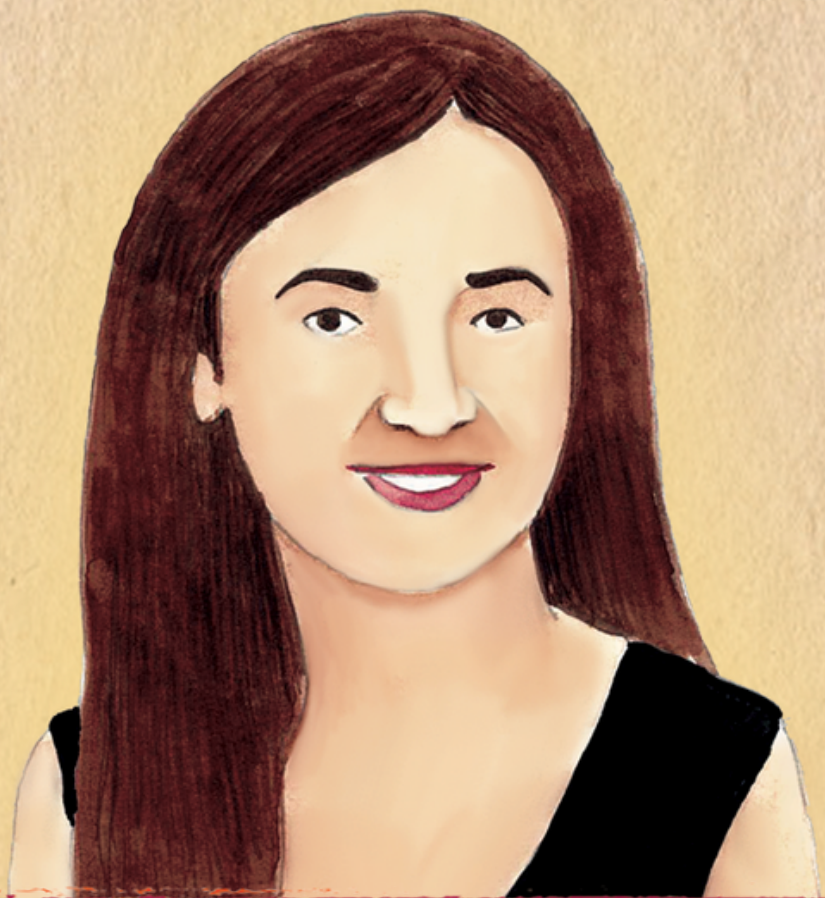
Müfide Küley

<https://web.archive.org/web/20161225000218/http://tukdbursa.org.tr/?s=sayfa&id=180>

Woman in Science

The only educational institution that women could go to after high school in the Ottoman Empire was Darümuallimat, namely the Girls' Teacher School in Çapa, Istanbul. After graduating from the Faculty of Science in 1921, her desire to start the medical faculty resulted in a protocol that declared a woman can not be a doctor. Considering that women cannot continue their profession after marriage, entering the medical school will damage their "chastity and morality" values, they should not examine male patients and should not participate in anatomy dissections. In 1922, she applied again with her ten girlfriends and despite all objections she was admitted to the Faculty of Medicine. She was among the founding members of the Turkish University Women Association in 1949.





“Being an independent woman in this century, in this country, is really difficult. At the start of my career, I was really affected by comments from my male colleagues but then I realized, I don’t have time to respond. It's time for me to do my research and to answer those comments with my work. And so that’s what I did.” ”

CANAN DAĞDEVİREN

Material scientist

Turkey • Date of birth May 4, 1985

Education

Canan studied Physics Engineering at the Hacettepe University in Ankara, graduating in 2007. She obtained a Master of Science degree from Sabancı University in Istanbul, and won a Fulbright scholarship for study in the United States. With this scholarship, she chose to conduct research in materials science and engineering at the University of Illinois at Urbana Champaign, where she focused on exploring patterning techniques and creating piezoelectric biomedical systems. In August 2014 she received her PhD degree. The title of her PhD thesis was Ferroelectric/ Piezoelectric Materials Flexible/ Stretchable/ Wearable/ Implantable Sensors, Actuators, Mechanical Energy Harvesters, Transducers, Microfabrication.



Academic career

Canan went to Cambridge, MA to become a Junior Fellow in the Society of Fellows at Harvard University. She was the first Turkish scientist in the history of the Harvard Society to do so. She became a postdoctoral research associate at MIT's Koch Institute for Integrative Cancer Research. Currently, she is an Assistant Professor at MIT. She teaches a course on conformable devices every semester, and also serves as a freshman advisor. As a faculty member, she directs her own Conformable Decoders research group at the MIT Media Lab.



Awards

In 2014 the first Turkish scientist to be elected as a Junior Fellow of Harvard. In 2015, MIT Technology Review "Top 35 Innovators Under 35" (inventor category), Forbes magazine "Top 30 Under 30 in Science." Gifted Citizen by Ciudad de las Ideas of Puebla, Mexico, and the Spotlight Health Scholar by Aspen Institute. She placed first in the Medical Innovation Category of Ten Outstanding Young Persons of the World (TOYP) by Junior Chamber International (JCI), and received the 2017 Innovation and Technology Delegate of the American Academy of Achievement Award. Dagdeviren was also awarded the Science and Sci Life Prize for Young Scientists in Translational Medicine Category by Science/AAAS and SciLifeLab. In 2019, Dagdeviren was awarded the Kadir Has University Promising Scientist Award, and recognized in Fortune Turkey's "40 Under 40." She was also named as one of the United States's "87 brightest young engineers" by the National Academy of Engineering (NAE).



Main contribution

Her group works at the intersection of materials science, engineering and biomedical engineering. They create mechanically adaptive electromechanical systems that can intimately integrate with the target object of interest for sensing, actuation, and energy harvesting, among other applications. Canan believes that vital information from nature and the human body is "coded" in various forms of physical patterns. Her research focuses on the creation of conformable decoders that can "decode" these patterns into beneficial signals and/or energy. Since beginning her current position at the MIT Media Lab, she published a paper "Towards personalized medicine: the evolution of imperceptible healthcare technologies," published in the November 2018 issue of Foresight, a journal of future studies, strategic thinking, and policy.



CANAN DAĞDEVIREN

Links



Biography of Canan Dağdeviren
<https://www.media.mit.edu/people/canand/overview/>

Interview
<https://www.youtube.com/watch?v=AFMgWZYY4dY>

Presentation of her work
<https://www.youtube.com/watch?v=CZCTpflCoxM>

Woman in Science

Dagdeviren is the first Turkish scientist in the history of the Harvard Society to become a Junior Fellow in the Society of Fellows at Harvard University. In addition to her work in the materials science and engineering fields, Dagdeviren seeks to inspire an upcoming generation of young scientists, specifically young women pursuing STEM careers. She uses social media as a tool to connect with young minds across the globe, specifically through her Twitter, Instagram and Facebook accounts. In February 2018, she was invited to speak at the Women in Science in Diplomacy for Sustaining Peace and Development event as part of the celebration of International Day of Women and Girls in Science at the United Nations. Since 2015, she has participated in numerous Women in Science and Engineering panels across the globe and in various outreach activities that target women





*“I am fascinated
by life, that's why
I want to break it!”*

BETÜL KAÇAR

Astrobiology, chemistry

Turkey • Date of birth 1975

Education

In her young age she attended Cavusoglu High School. She studied Chemistry at Marmara University, but was dissatisfied with the amount of free time in her schedule and began to volunteer. Whilst volunteering at an international meeting about Alzheimer's, she learned about how the molecular properties of enzymes could change with age. This inspired her to apply to the Howard Hughes Medical Institute, where she spent a summer conducting scientific research in Emory University. She returned to Emory University in 2004, and eventually earned a PhD in Biomolecular Chemistry in 2010.



BETÜL KAÇAR

Academic career

She was awarded a NASA postdoctoral fellowship, followed by an Early Career Fellowship and funding from the NASA Astrobiology Institute and Exobiology Branch. She was appointed as a postdoctoral fellow at Georgia Institute of Technology in 2010. In 2011 she became a member of the Blue Marble Space Institute of Science. She joined Harvard University in 2012, where she worked in the Department of Organismic and Evolutionary Biology. She is a member of the Harvard Origins Initiative. In 2017 Kacar was appointed to University of Arizona, where she is an Assistant Professor of Astronomy and Molecular and Cell Biology. She is also an associate professor at the Earth-Life Science Institute at the Tokyo Institute of Technology.



Awards

She designed her own research topic, for which she received NASA Young Researcher Award as well as NASA Astrobiology Institute and NASA Exobiology researcher awards. She is also named a Scialog Fellow for the Search for life in the Universe in 2020 by the Research Corporation for Science Advancement and the Kavli Foundation.



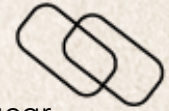
Main contribution

At Harvard she looked to identify how to reconstruct historical enzymatic intermediates between global geochemical reservoirs and biological activity. She appeared on the Science for the Public, where she spoke about trying to reconstruct ancient genes about how they developed over millions of years. She managed to revive an ancient protein and managed to get it to evolve inside an Escherichia coli. Kacar is interested in how we can understand the molecular mechanisms of evolution. She is interested in public engagement and outreach. During her PhD she began to translate articles about evolution into other languages. In 2012 she co-founded SAGANet, an astrobiology social network. She is on the Board of Advisory Committee of the MIT BioBuilder Foundation



BETÜL KAÇAR

Links



Biography of Betül Kaçar

<https://mcb.arizona.edu/profile/bet%C3%BCI-ka%C3%A7ar>

Interview

https://www.youtube.com/watch?v=7U_3gGjhjwQ

Woman in Science

Her parents were immigrants to Istanbul from the Black Sea region, and no women in her family had received a formal education. In 2016 she was named Way Cool Scientist by the Science Club for Girls. Her work was featured on PBS. She was interviewed in the magazine Turk of America. She is very engaged in science communication and outreach, and avocator for women in science.





*“Neutron stars
are wonderful
environments to
study things that
we can not study
in terrestrial labs”*

FERYAL ÖZEL

Astrophysics

Turkey • Date of birth 1975

Education

She studied in 1992 at Üsküdar American Academy, İstanbul, Turkey. In 1996, she did her Bachelor of Science in Physics and Applied Mathematics, Columbia University, New York City. The following year, she did her Master of Science in Physics, Niels Bohr Institute, Copenhagen. In 2002 she completed her PhD in Astrophysics at Harvard University.



FERYAL ÖZEL

Awards

Özel received the Maria Goeppert Mayer award from the American Physical Society in 2013 for her outstanding contributions to neutron star astrophysics. Her awards include: Fellowship, John Simon Guggenheim Memorial Foundation, 2016, Fellowship, Radcliffe Institute for Advanced Studies, 2012–2013, Bart J. Bok Prize, Harvard University, 2010, Lucas Award, San Diego Astronomy Association, 2010, Visiting Scholar Fellowship, Turkish Scientific and Technical Research Foundation, 2007, Hubble Postdoctoral Fellowship, 2002–2005, Distinguished Scholar Award, Daughters of Atatürk Foundation, 2003, Keck Fellowship, Institute for Advanced Study, 2002, Van Vleck Fellowship, Harvard University, 1999, Kostrup Prize, Niels Bohr Institute, 1997, Niels Bohr Institute Graduate Fellowship, 1996–1997, Applied Mathematics Faculty Award, Columbia University, 1996, Fu Foundation Scholarship, Columbia University, 1994–1996, Research Fellowship, CERN, 1995, Turkish Health and Education Foundation Scholarship, 1992–1994.



Academic career

As of 2020, Özel is a professor at the University of Arizona in Tucson, in the Astronomy Department and Steward Observatory. She was a Hubble Fellow and member at the Institute for Advanced Study in Princeton, New Jersey. She was a Fellow at the Harvard-Radcliffe Institute and a Visiting Professor at the Miller Institute at UC Berkeley. She is a collaborator of Event Horizon Telescope (EHT) that released the first image of a black hole.



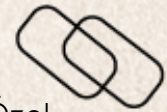
Main contribution

She was specialized in the physics of compact objects and high energy astrophysical phenomena. As a collaborator of Event Horizon Telescope she was part of the team that released the first image of a black hole. She develops theoretical and computational methods to study black holes and neutron stars and to build models of their extreme environments. She pioneered a new technique that allowed her to make the first accurate measurement of neutron star radii and to derive significant constraints on the cold dense matter equation of state. She also made the first predictions of the images of nearby supermassive black holes at different wavelengths based on her work on accretion flows, which guided the development of the Event Horizon Telescope.



FERYAL ÖZEL

Links



Biography of Feryal Özel

<https://www.as.arizona.edu/people/faculty/feryal-%C3%B6zel>

<https://www.thirteen.org/bigideas/ozel.html>

First image of black hole

<https://www.youtube.com/watch?v=jNlF0xCWAw0>

Woman in Science

Dr. Ozel is an enthusiastic and committed science communicator and public speaker. She has contributed to numerous science documentaries on PBS, the History Channel, and CNN International, served as scientific advisor to PBS and BBC programs, given public talks to very large audiences around the world, and worked with planetariums on new shows. She has partnered with Louis Vuitton to support a women's literacy campaign in the Middle East, to enable access to information among adult women and, with the Sabanci Foundation, to enable access to education for younger girls. She also works with K-12 teacher enrichment programs and leads Zoom classroom events for worldwide dissemination of astrophysics at the high school science level.





*“With a small
scientific
investment it is
possible to become
one of the giants”*

ENGİN ARIK

Particle physics, high energy

Turkey • 1948 - 2007

Education

She received her BSc in 1969 in mathematics and physics from Istanbul University. Subsequently, she received her MSc in 1971 and PhD in 1976 in experimental high energy physics from the University of Pittsburgh, United States. She performed post doctoral studies at the Westfield College in University of London.



ENGIN ARIK

Academic career

Returning 1979 to Turkey, she became a member of faculty at Boğaziçi University. In 1983, she left the university to work with Control Data Corporation for two years.

Arik subsequently became a professor at Boğaziçi University in 1988. Between 1997 and 2000, Arik was commissioned by the government to represent Turkey at the sessions of Comprehensive Nuclear-Test-Ban Treaty held at the International Atomic Energy Agency (IAEA) of the UN in Vienna, Austria. She was a member of the ATLAS and CAST collaborations at CERN in Switzerland.



Awards

Her awards include:
Bilsland Dissertation Fellowship, Purdue University, 2008-2000, Lynn Fellowship, Purdue University, 2005-2006, Full Scholarship, Koc University, 1996-2001, The Turkish State Scholarship, 1987-1993.
There is a street named after her in the İlkyerleşim neighborhood of the Yenimahalle district in Ankara, Turkey.



Main contribution

She has more than 100 international studies on experimental and phenomenological High Energy Physics, detectors, Nuclear Physics applications, and mathematical physics. " She was assigned at the request of the Ministry of Foreign Affairs in the "Organization for the Banning of Nuclear Trials" established within the United Nations organization in Vienna between 1997-2000. While in Turkey at the CERN laboratory PS160, NA31.2, Charminar, the CHORUS, SMC, ATLAS, has participated in the CAST experiment.



Woman in Science

Arik died in the Atlasjet Flight 4203 crash on November 30, 2007. There is doubt whether she had been assassinated and the crash was not an accident. She was married to Metin Arık, also a professor in the same department at Boğaziçi University, and had two children.



ENGIN ARIK

Links



Biography of Engin Arık

<http://www.enginarik.com/Home>

https://en.wikipedia.org/wiki/Engin_Ar%C4%B1k

Article

<https://www.turktoyu.com/engin-arik-enerji-sorununa-toryum-ile-cozum-bulan-bilim-insanimiz>

Interview in Turkish

<https://www.youtube.com/watch?v=KTikMssUemI>



“In class, I love telling my students, ‘If I have done it, you can do it too’ Especially for women, who even at a young age can internalize impostor syndrome, this is a big step forward.”

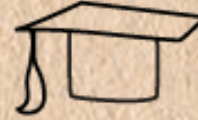
BILGE DEMIRKÖZ

Astropracticle, high energy

Turkey • Date of birth 1980

Education

She attended Robert College for her high school studies. She wanted to take part in research during her undergraduate degree, so moved to Massachusetts Institute of Technology. She won Joel Matthew Orloff Award in 2000. She earned a Bachelor of Science in Physics and Music from Massachusetts Institute of Technology in 2001. She started working on the Alpha Magnetic Spectrometer. She was offered PhD positions in California Institute of Technology, MIT, Stanford University and Harvard University. Despite originally starting her PhD at MIT, the Space Shuttle Challenger disaster resulted in her moving to the University of Oxford. She was a Science and Technology Facilities Council Dorothy Hodgkin Scholar under the supervision of Antony Weidberg. She eventually completed her postgraduate studies at the University of Oxford, and was a member of Balliol College. Here she worked on the ATLAS experiment. When the Large Hadron Collider was delayed, Demirköz tested her detector using cosmic rays. She completed her thesis, Construction and Performance of the ATLAS SCT Barrels and Cosmic Tests, in 2007.



BILGE DEMIRKÖZ

Awards

She won the Joel Matthew Orloff Award in 2000.

She has thereafter received many national and international awards, the most recent of which is the 2017 UNESCO-L'Oréal For Women in Science Award.



Academic career

From 2007 to 2009 Demirköz worked as a Trigger Expert for the ATLAS experiment. She was a postdoctoral scholar at the University of Cambridge and IFAE in 2009. At IFAE, Demirköz worked on the jet shapes of 900 GeV and 7 TeV data from the ATLAS experiment. She joined Middle East Technical University in 2001, joining the Alpha Magnetic Spectrometer experiment on the International Space Station. She was selected as a TED fellow in 2011. She was appointed to the CERN User Advisory Committee in 2011. She 2014 Demirköz has served on the Board of the Arts at CERN. She was elected to the Turkish Academy of Sciences in June 2015. She leads the Particle Radiation Tests Creation Laboratory, the first collaboration between Turkey and CERN. This allows her to study the radiation environment of the earth as well as monitoring the impact of radiation on electronic devices. Demirköz was named a L'Oréal-UNESCO International Rising Talent in 2017. She was promoted to Professor at Middle East Technical University in 2017. She serves as the Principal Investigator of the astroparticle physics group. That year she was nominated to the Global Young Academy. She was featured in the 2018 Science Magazine celebration of women in science



Main contribution

She coordinates the Particle Radiation Tests Creation Laboratory, the first collaboration between Turkey and CERN, the European Organization for Nuclear Research. This allows her to study the radiation environment of the earth as well as monitoring the impact of radiation on electronic devices



BILGE DEMIRKÖZ

Links



Biography of Bilge Demirköz

https://en.wikipedia.org/wiki/Bilge_Demirk%C3%B6z

Research

<http://scholar.google.com/citations?user=UHeeSJwAAAAJ&hl=en>

Interview in Turkish

<https://www.youtube.com/watch?v=7x2ClqXTwG0>

Woman in Science

She was featured in the 2018 Science Magazine celebration of women in science. She founded the Engin Arik Fellowship in 2008, a fund which supports Turkish students at CERN. In 2015 she spoke at the Turkish Women's Network.





“All of these technologies about big data provide great opportunities for us”

ASUMAN ÖZDAĞLAR

Social and economic networks

Turkey • 16 December 1974

Education

She studied in the Electrical Engineering department of the Middle East Technical University (METU) in Ankara and received a Bachelor's degree in 1996. She then continued her studies at the Massachusetts Institute of Technology (MIT) in the United States, and received her PhD in 2003.



Academic career

She served as an assistant professor (2003), associate professor (2008) and professor (2012) in the same university. In 2017, she was named the new head of the Department of Electrical Engineering and Computer Science (EECS) at MIT.



ASUMAN ÖZDAĞLAR

Awards



Bulent Kerim Altay prize
(METU-TURKEY) 1993-1996
NATO Science Fellow 1996
Microsoft Fellow 2001
Graduate Student Council Teaching
Award- MIT School of Engineering 2004
Provost Award 2005
Sundarum Seshu Scholar at the
Coordinated Science Lab., UIUC, 2005
Inaugural lecture.
NSF CAREER Award 2005
Class of 1943 Career Development Chair
2006
AACC Donald P. Eckman Award 2008
(The citation reads: "For contributions to
optimization theory, game theory and its
applications to congested
markets, and learning in large networks
with applications to human and social
networks")
Kavli Fellow of the National Academy of
Sciences 2011
Inaugural Steven and Renee Innovation
Fellowship 2012

Main contribution

Her research areas include Nonlinear and convex optimization, Game theory, social and economic networks, Distributed optimization methods, Network optimization and control. Her predecessor Anantha Chandrakasan says, "Professor Ozdaglar is an inspiring researcher and has emerged as a true leader in the areas of optimization theory and algorithms, game theory, and networks. The research in her group spans the areas of optimization theory, with emphasis on nonlinear optimization and distributed optimization methods, game theory, network economics, and network optimization and control. The group focuses on problems that arise in the analysis and optimization of large scale dynamic multi-agent networked systems, including communication networks, transportation networks, and social and economic networks.



ASUMAN ÖZDAĞLAR

Links



Biography of Asuman Özdağlar
<http://web.mit.edu/asuman/Desktop/asuman/www/>

Interview

https://www.youtube.com/watch?v=xn_5yOpxdRk

Woman in Science

Özdağlar, who has applications in fields such as economics, bioinformatics, social networks as well as information systems, was with one of the most respected awards given to young scientists under the age of 35 by the American Automatic Control Organization in 2008 for its outstanding research contributions in the field of Control Theory. Özdağlar, who has been awarded 15 times in total, has seven books and book chapters and many papers. Between 2017 and 2018, she served as the temporary head of MIT Electrical-Electronics Engineering and Computer Science; Since January 1, 2018, she was appointed as the head of the Department of Electrical Electronics and Computer Science.





“I never had any hesitation or regrets in this sense. My life has been enriched by excellent human relations, work and interests. I have never felt lonely.”

RITA LEVI MONTALCINI

Neurology

Italy • April 22, 1909 – December 30, 2012

Education

In eight months she filled her gaps in Latin, Greek and mathematics, graduated from high school, and entered medical school in Turin. In 1936 she graduated from medical school with a summa cum laude degree in Medicine and Surgery, and enrolled in the three year specialization in neurology and psychiatry.



Academic career

Levi-Montalcini lost her assistant position in the anatomy department after a 1938 law barring Jews from university positions was passed. During World War II she set up a laboratory in her bedroom and studied the growth of nerve fibers in chicken embryos, which laid the groundwork for much of her later research. She was made a full professor in 1958. In 1962, she established a second laboratory in Rome and divided her time between there and St. Louis.



RITA LEVI MONTALCINI

Awards

In 1963, she became the first woman to receive the Max Weinstein Award (given by the United Cerebral Palsy Association) due to her significant contributions into neurological research. Levi-Montalcini earned a Nobel Prize along with Stanley Cohen in 1986 in the physiology or medicine category.



Main contribution

In 1952, she did her most important work: isolating nerve growth factor (NGF) from observations of certain cancerous tissues that cause extremely rapid growth of nerve cells. By transferring pieces of tumors to chick embryos, Montalcini established a mass of cells that was full of nerve fibers.



RITA LEVI MONTALCINI

Links



Biography of Rita Levi Montalcini
<https://www.nobelprize.org/prizes/medicine/1986/levi-montalcini/biographical/>

Short video

https://www.youtube.com/watch?v=scyr_m4eb_M

Interview

<https://www.youtube.com/watch?v=WgkAR-vrJpM>

Woman in Science

The heavy bombing of Turin by Anglo-American air forces in 1941 made it imperative to abandon Turin and move to a country cottage where I rebuilt my mini-laboratory and resumed my experiments. In the Fall of 1943, the invasion of Italy by the German army forced us to abandon our now dangerous refuge in Piemonte and flee to Florence, where we lived underground until the end of the war.





*“Never abandon
your dreams.
You may regret
it for the rest of
your life.”*

FABIOLA GIANOTTI

Particle physics, high energy

Italy • October 29, 1960

Education

Gianotti found her passion for scientific research after reading a biography on Marie Curie. Previously, she had studied the humanities, focusing on music and philosophy at the Liceo classico. Gianotti received a PhD in experimental particle physics from the University of Milan in 1989.



FABIOLA GIANOTTI

Awards

Special Fundamental
Physics Prize (2012)



Foreign Associate of the National
Academy of sciences (2015)

Wilhelm Exner Medal (2017)

Academic career

Since 1996, Gianotti has worked at CERN, starting with a fellowship and continuing to become a full-time research physicist. In 2009 she was promoted to project leader and Spokesperson of the ATLAS Collaboration. She also worked on the WA70, UA2 and ALEPH experiments at CERN, where she was involved in detector development, software development and data analysis. In 2016 she was elected to be the first female Director-General of CERN. She has since been reappointed for a second term, which will end in 2025.



Main contribution

During Gianotti's time as Spokesperson of ATLAS, the experiment was one of two involved in the observation of the Higgs boson. On July 4, 2012, Gianotti announced the discovery of the particle. Until the observation, the Higgs boson was a purely theoretical part of the Standard Model of particle physics.



FABIOLA GIANOTTI

Links



Biography of Fabiola Gianotti

<https://home.cern/about/who-we-are/our-people/biographies/fabiola-gianotti>

Interview

https://www.youtube.com/watch?v=dPYr_i3mTsM

Woman in Science

She is considered a role model and in many interviews, Fabiola Giannotti stated that girls must be encouraged not to give up on science careers.





*“Us atheist people,
we believe we have
to act properly and
honestly for a moral
principle and not
because we expect
an award in Paradise.”*

MARGHERITA HACK

Astrophysics

Italy • 12 June 1922 – 29 June 2013

Education

Hack attended the Liceo Classico "Galileo Galilei" in Florence, but the outbreak of World War II prevented her from taking her exams. In 1945, she graduated in physics from the University of Florence with a test score of 101/110; her thesis in astrophysics was on Cepheid variables, based on her studies in the Arcetri Observatory, then under the direction of Giorgio Abetti.



MARGHERITA HACK

Awards

Knight Grand Cross of
the Order of Merit of
the Italian Republic
-awarded on 28 May 2012



Gold Medal of the Italian Order of
Merit for Culture and Art -
awarded on 27 May 1998

Targa Giuseppe Piazzi (1994)

Premio Internazionale Cortina
Ulisse (1995)

Academic career

She was full professor of astronomy at the University of Trieste from 1964 to 1^o November 1992, when she was placed "out of role" for seniority. She has been the first Italian woman to administrate the Trieste Astronomical Observatory from 1964 to 1987, bringing it to international fame. She has published several original papers in international journals and several books both of popular science and university level.



Main contribution

In 1978 Margherita Hack founded the bimonthly magazine L'Astronomia whose first issue came out in November 1979; later, together with Corrado Lamberti, she directed the magazine of popular science and astronomy culture Le Stelle. Hack was also known for her activities outside of science, especially in the social and political fields.



MARGHERITA HACK

Links



Biography of Margherita Hack
https://en.wikipedia.org/wiki/Margherita_Hack

Short video
<https://www.youtube.com/watch?v=lizquqiUxGI>

Interview in Italian
<https://www.youtube.com/watch?v=pmf9qz0C-Gs>

Woman in Science

Margherita Hack was always very proud and never felt penalized for being a woman, but she has always supported the fights for equality and rights. She thought that education is the only tool for the real independence. For this reason, she strongly believed in the role of the scientific popularization, in which she was involved since she was very young.

One of her encouraging motto was "we must be combative, not shy".





*“When you discover
new things every
minute and your
mind is absorbing
so many experiences,
it feels like time
expands.”*

SAMANTHA CRISTOFORETTI

Abstract algebra and theoretical physics

Italy • 26 April 1977

Education

When she was 18, she took an AFSEXchange program to the US and attended Space Camp. She studied in Bolzano and Trento and graduated from the Technical University of Munich with a degree in Mechanical Engineering. She studied at the École nationale supérieure de l'aéronautique et de l'espace in Toulouse, France, and at the Mendeleev Russian University of Chemistry and Technology in Moscow.



Academic career

She graduated in Aeronautics Sciences (University 'Federico II', Naples) at the Accademia Aeronautica in Pozzuoli, becoming one of the first women to be a lieutenant and fighter pilot in the Italian Air Force. She is the second Space Camp alumnus in orbit. As part of her studies, she spent four months at the Ecole Nationale Supérieure de l'Aéronautique et de l'Espace in Toulouse, France, working on an experimental project in aerodynamics. She wrote her master's thesis on solid rocket propellants during a 10-month research stay at the Mendeleev University of Chemical Technologies in Moscow, Russia.



SAMANTHA CRISTOFORETTI

Awards

Commander of the Order of Merit of the Italian Republic on 6 March 2013



Knight Grand Cross of the Order of Merit of the Italian Republic on 16 July 2015

Main contribution

In 2012 Samantha was assigned to the Futura mission. Travelling the world as part of her astronaut training, she had a head start as she already spoke German, French, English and Russian. She also stayed 199 days in space which is the record for the longest uninterrupted spaceflight by a European astronaut.



Woman in Science

On 19 May 2021, Samantha Cristoforetti was appointed as the first European woman to lead the International Space Station. She enters a rare club: fewer than 600 astronauts have travelled in space and only about ten percent of them were women.



SAMANTHA CRISTOFORETTI

Links



Biography of Samantha Cristoforetti

https://www.esa.int/Science_Exploration/Human_and_Robotic_Exploration/Astronauts/Samantha_Cristoforetti

Interview

https://www.youtube.com/watch?v=Uu_NQ5GBVhk

Tedex talk

<https://www.youtube.com/watch?v=99i3TICw8z8>



“There is no alternative medicine simply because as an alternative to science, that is, to validated facts, there is only non-science.”

ELENA CATTANEO

Abstract algebra and theoretical physics

Italy • Date of birth 1962

Education

After graduating (summa cum laude) in pharmacy in 1986, she moved to Boston in the United States for a few years, where she specialized at the Massachusetts Institute of Technology. She studied neural stem cell differentiation in the area of the human brain associated with degenerative diseases under Professor Ronald McKay.



Academic career

She is now full professor at the Laboratory of Stem Cell Biology and Pharmacology of Neurodegenerative Diseases in the Department of Biosciences of University of Milan.



ELENA CATTANEO

Awards



Cattaneo was appointed to the Senate of Italy as a Senator for life, the youngest in Italian history, by then President Giorgio Napolitano on 30 August 2013, along with Claudio Abbado, Renzo Piano and Carlo Rubbia. Of his choice of her as Senator for Life, President Napolitano said: "choosing her is meant as an appreciation and an encouragement for many Italians of the new generations who commit themselves, amid difficulties, to scientific research". Cattaneo has also been awarded the Medaglia teresiana by the University of Pavia, in 2013.

Main contribution

Professor Elena Cattaneo is Director of the Laboratory of Stem Cell Biology and Pharmacology of Neurodegenerative Diseases at the Department of Pharmacological Sciences, as well as a co-founder and first appointed Director of UniStem , the Centre for Stem Cell Research of the University of Milano. The main research theme of her lab is neural stem cells, and the molecular pathophysiology of Huntington's Disease.



ELENA CATTANEO

Links



Biography of Elena Cattaneo

https://en.wikipedia.org/wiki/Elena_Cattaneo

<https://ipscell.com/2013/10/stem-cell-person-of-the-year-2013-elena-cattaneo/>

Presentation of research

<https://www.youtube.com/watch?v=W04pppF5OHs>

Woman in Science

Her contribution to the treatment of Huntington's Disease is very important. She also fighting against prejudices and false-treatments of Huntington's disease. She organized the campaign HDdenomore (HD=Huntington's disease), which aims to relieve families of the stigma of the disease.





*“You must do your
job with great
devotion, dedication,
diligence and care.”*

LUCIA VOTANO

Astropracticle physics

Italy • Date of birth 1947

Education

She graduated in 1965 at the Tommaso Campanella Classical High School in Reggio Calabria and graduated with honors in General Physics from the La Sapienza University of Rome in 1971.



LUCIA VOTANO

Academic career

In 1975, she became a researcher at ENEA, in 1976 he joined INFN as a researcher and in 1981 he became his first researcher. In 1987, she became head of the Scientific Information Service of the national laboratories of Frascati and in 1999 he held the position of Director of the Research Division of the National Laboratories of Frascati for two mandates. Since the mid-80s she has mainly devoted herself to physics astroparticle with the LVD experiment at the Gran Sasso Laboratories INFN, a perennial observatory for the detection of stellar collapse in our galaxy, and with the ROG experiment at the Frascati Laboratories INFN dedicated to the search for gravitational waves. Subsequently she was employed at the Gran Sasso Laboratory in the OPERA experiment that uses the neutrino beam produced at CERN in Geneva and sent to the Gran Sasso. The OPERA experiment looked at the world for the first time in such a way directed a metamorphosis of the neutrino, the transformation, that is, of a neutrino in an another. A discovery that opens the door to new physics. As part of the international collaboration OPERA, made up of around 150 scientists of various nationalities including Japan, Russia, France, Germany, Belgium, Switzerland, Croatia, Korea, Tunisia, was the President of the Collaboration Board, the governing body of the Collaboration. He is co-author of more than 290 scientific articles published in Journals International. In 2009, the INFN Governing Council elected her Director of the National Laboratory of the Gran Sasso (LNGS) of the National Institute of Nuclear Physics (INFN), the first woman to hold this role, and remained in office until 2012, when Stefano succeeded her.



Awards



On March 31, 2010 the President of the Italian Republic Giorgio Napolitano awarded her with the honor of Commendatore for the merit of the Italian Republic. Also she has received the following awards:

Minerva Award for Scientific Career

NordSud International Prize for exact and natural sciences Calabria Award

L'ALTRA ITALIA International Award

GUIDO DORSO Award

Virginia Centurione Bracelli Award

Artemisia Award 2012

Main contribution

During her tenure she was one of the protagonists of the discovery of neutrino oscillations with the OPERA experiment started with the sending of neutrinos by CERN of Geneva to the Gran Sasso.



LUCIA VOTANO

Links



Biography of Lucia Votano

https://it.wikipedia.org/wiki/Lucia_Votano

http://www.centrointernazionalecrittoridellacalabria.it/public/file_caricati/ComitatoSA/Fisico%20Lucia%20Votano.pdf

Interview in Italian

<https://www.youtube.com/watch?v=lozItOhvmGs>

Video in Italian

<https://www.raiplay.it/video/2020/05/maestri-lucia-votano-l-universo-imperfetto-fisica-a505f656-ed87-45b6-bca9-85b068b1231d.html>

Woman in Science

As a woman, she faced prejudices about the necessity of women education. Also, her mother stopped studying at 14. Besides these difficulties, she made a succesfull career in research.

The physicist Lucia Votano is the first woman to be named as Director of the National Laboratory in Gran Sasso of Italy's National Institute of Nuclear Physics (INFN). The appointment was made by INFN's Board of Directors, following the proposal of the Council. Doctor Votano will take office in September, when the second and last term of the current Director, Professor Eugenio Coccia, expires.

Also, it is impressive that it has been a member, representing Italy, of the SAC (Scientific Advisory Committee) for the European coordination of astro physics particle (ApPEC) and the CERN Strategy Group that is outlining the scientific strategy of CERN and European in the physics of elementary particles





“To be always alone in the midst of an assembly of men, and to hear all their discourses and quarrels, doesn't seem to befit the decency and modesty of female sex.””

LAURA BASSI

Physicist

Italy • 1711 - 1778

Education

Bassi was privately educated. Her cousin Father Lorenzo Stegani taught her Latin, French, and mathematics from age five. From the age of thirteen to twenty she was taught philosophy, metaphysics, logic, and natural philosophy by Gaetano Tacconi, the family physician and professor of medicine at the University of Bologna. She and Tacconi began to drift apart after Bassi discovered an interest in Newtonian science, despite Tacconi's preference for her to focus on the less controversial Cartesian teachings.
etc



LAURA BASSI

Academic career

On 27 June 1732, Bassi defended twelve additional theses at the Archiginnasio, the main building of the University of Bologna. This was a petition for a teaching position to the Senate of the university. Her theses covered a wide range of subjects such as chemistry, physics, hydraulics, mathematics, mechanics and techniques. On 29 October 1732, the Senate and the University of Bologna granted Bassi's candidature and was appointed professor of natural philosophy (modern equivalent of honorary position) in December. She became the first salaried woman lecturer in the world thus beginning her academic career. The first lecture she gave was titled "De aqua corpore naturali elemento aliorum corporum parte universi", which can roughly be translated from Latin as, "Water as a natural element of all other bodies".



Awards

A bronze medal was awarded to Bassi by painter Domenico Maria Fratta and engraver Antonio Lazzari, to celebrate her first series of classes titled "Pubblica Docente e Collegiata". The medal displayed Bassi's image on one side, and on the other, the phrase "Soli cui fas vidisse Minerva". The phrase can roughly be translated to, "Only you can see Minerva".
After her death, a marble statue was made in her memory and placed above the Nautical room in the institute.
etc



Main contribution

From 1746 to 1777 she gave only one formal dissertation per year ranging in topic from the problem of gravity to electricity. It is reported that she gave at least thirty-one dissertations to the university. In 1739 her plea for normal teaching duty was supported by Lambertini and Flaminio Scarselli, the secretary to the Bolognese ambassador at the papal court. She was again denied, but she was granted to start private lessons and funds for experiments at her home in 1749. This allowed her to veer away from the constraints of the university and explore new ideas. The Senate expected Bassi to attend various events because she was a symbol and political figure. The Carnival Anatomy, a public dissection with tickets open to anyone, was an event she was expected to attend because it was a central feature of public life at the university which attracted the attention of many foreigners and important community members. She began attending this event annually in 1734



LAURA BASSI

Links



Laura Bassi

https://en.wikipedia.org/wiki/Laura_Bassi

<https://www.britannica.com/biography/Laura-Bassi>

<https://www.projectcontinua.org/laura-bassi/>

Short video

<https://www.youtube.com/watch?v=PP76tBT7Bko>

Woman in Science

Recognised and depicted as "Minerva" (goddess of wisdom), she was the second woman in the world to earn the degree of Doctor of Philosophy (after the philosopher Elena Cornaro Piscopia, who had received doctorate in 1678) and the first woman to have doctorate in science. Working at the University of Bologna, she was also the first salaried woman teacher in a university. In fact, at one time she was the highest paid employee. She eventually became the first university professor in the world] She was also the first woman member of any scientific establishment, when she was elected to the Academy of Sciences of the Institute of Bologna in 1732.

A 31 km crater on Venus honours her name along with a high school, and a city street, Via Laura Bassi Veratti, in Bologna. The Editing Press offers Laura Bassi Scholarship thrice in a year since 2018 to junior academics, master's and doctoral candidates.





“Analytics [...] is the Art of resolving all kinds of Mathematical Questions, by finding or computing unknown numbers, or quantities, by the means of others that are known or given.”

MARIA AGNESI

Math, philosophy

Italy • 1718 - 1799

Education

At her teens, Maria mastered mathematics. The Agnesi home was a gathering place of the most distinguished intellectuals of the day. Maria participated in most of the seminars, engaging with the guests in abstract philosophical and mathematical discussions. Maria was very shy in nature and did not like these meetings.



MARIA AGNESI

Academic career

On 26 September 1750, she was awarded the chair of mathematics by Pope Benedict XIV. It is likely that Agnesi neither accepted nor rejected this offer. Some sources say that she received the papal rescript confirming her appointment, but she had already devoted herself to a retired life. While her name remained on the rolls of the university for forty-five years, she never went to Bologna. This does explain the confusion which appears in many accounts as to whether Agnesi ever held a chair of mathematics.



Awards

After the success of her book, Maria was elected to the Bologna Academy of Sciences. The university sent her a diploma and her name was added to the faculty. However, there is a debate over whether or not Maria accepted this appointment since by this time she had devoted herself to her work with charity. It seems that her father was the inspiration for her interest in mathematics



Main contribution

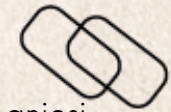
By the age of twenty, she began working on her most important work, *Analytical Institutions*, dealing with differential and integral calculus. "It is said that she started writing *Analytical Institutions* as a textbook for her brothers, which then grew into a more serious effort"

When her work was published in 1748, it caused a sensation in the academic world. It was one of the first and most complete works on finite and infinitesimal analysis. Maria's great contribution to mathematics with this book was that it brought the works of various mathematicians together in a very systematic way with her own interpretations. The book became a model of clarity, it was widely translated and used as a textbook



MARIA AGNIESI

Links



Biography of Maria Agnesi

https://en.wikipedia.org/wiki/Maria_Gaetana_Agnesi

<https://www.agnesscott.edu/lriddle/women/agnesi.htm>

Short video

<https://www.youtube.com/watch?v=UaqKD2l9IbY>

Woman in Science

She was the second woman ever to be granted professorship at a university, Laura Bassi being the first.

In 1751, she became ill again and was told not to study by her doctors. After the death of her father in 1752 she carried out a long-cherished purpose by giving herself to the study of theology, and especially of the Fathers and devoted herself to the poor, homeless, and sick, giving away the gifts she had received and begging for money to continue her work with the poor. In 1783, she founded and became the director of the Opera Pia Trivulzio, a home for Milan's elderly, where she lived as the nuns of the institution did.

