

# Women in tech Success in the shadow

Marilola Afonso



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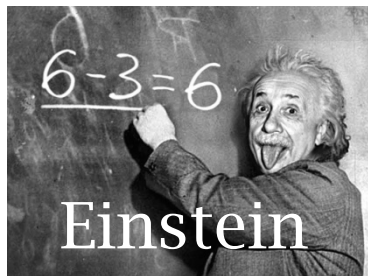


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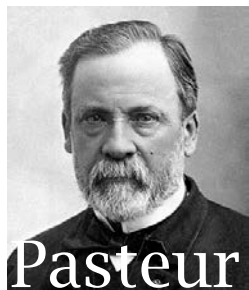


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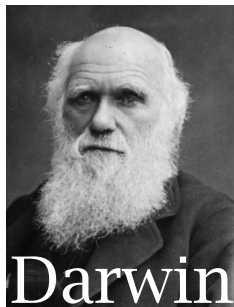
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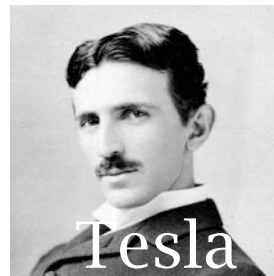
Einstein



Pasteur



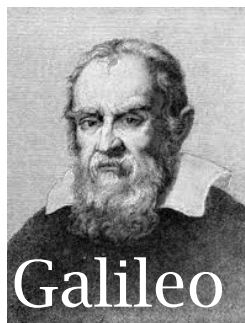
Darwin



Tesla



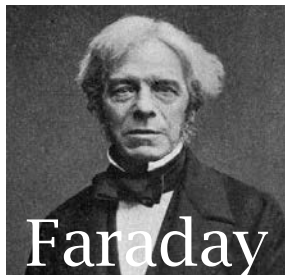
Copérnico



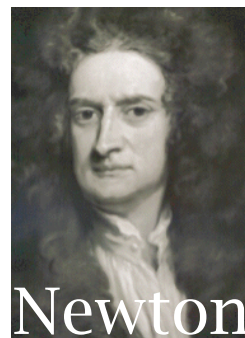
Galileo



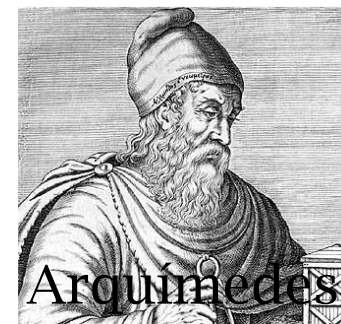
Hawking



Faraday



Newton



Arquímedes



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Science, 159(3810): 56-63, January 5, 1968

## The Matthew Effect in Science



The reward and communication systems of science are considered.

Robert K. Merton

This paper develops a conception of ways in which certain psychosocial processes affect the allocation of rewards to scientists for their contributions—an allocation which in turn affects the flow of ideas and findings through the communication network.

image and the public image of scientists are largely shaped by the communally validating testimony of significant others that they have variously lived up to the exacting institutional requirements of their roles.

reers are more productive later on than those who do not. And the Coles have also found that, at least in the case of contemporary American physics, the reward system operates largely in accord with institutional values of the science, inasmuch as quality of research is more often and more substantially rewarded than mere quantity.

In science as in other institutional realms, a special problem in the workings of the reward system turns up when individuals or organizations take on the job of gauging and suitably rewarding lofty performance on behalf of a large community. Thus, that ultimate accolade in 20th-century science, the Nobel prize, is often assumed to mark off its recipients from all the other scientists of the time. Yet this assumption is at odds with the well-known fact that a good number of scientists who have not received the prize and will not receive it have con-



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*For to every one who has will more be given, and he will have abundance ...*

— [Matthew](#) 25:14-30, *Parable of talents*



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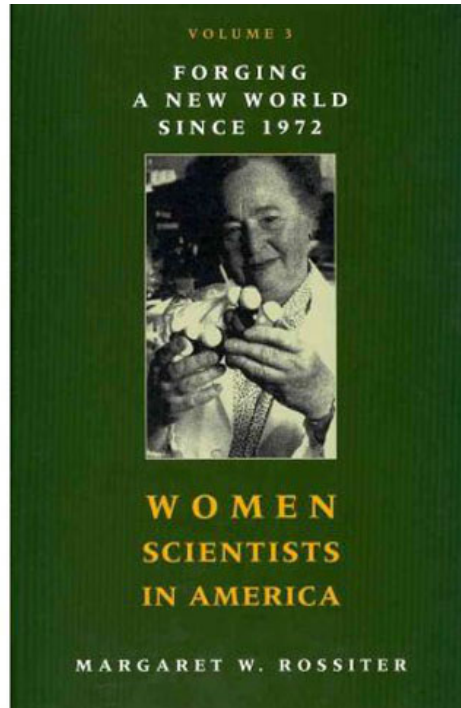


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*... but from him who has not, even what he has will be taken away.*

— [Matthew](#) 25:14-30, *Parable of talents*



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*Science*

*Technology*

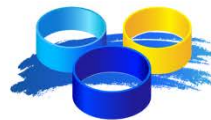


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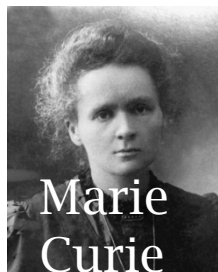
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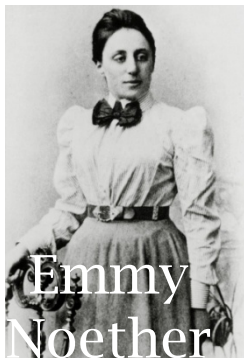
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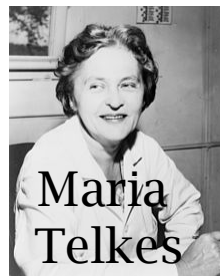
Hipatia



Marie  
Curie



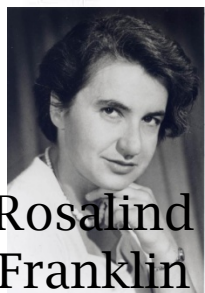
Emmy  
Noether



Maria  
Telkes



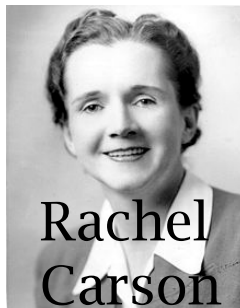
Cecilia Payne



Rosalind  
Franklin



Jennifer  
Doudna



Rachel  
Carson



Sau Lan  
Wu



Tiera Guinn



Jane Goodall

Marilola Afonso



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## *Ada Lovelace*

Mathematician  
1815-1852

*This machine can do whatever we know  
how to order it to perform*

*This brain of mine is something more than  
merely mortal, as time will show*



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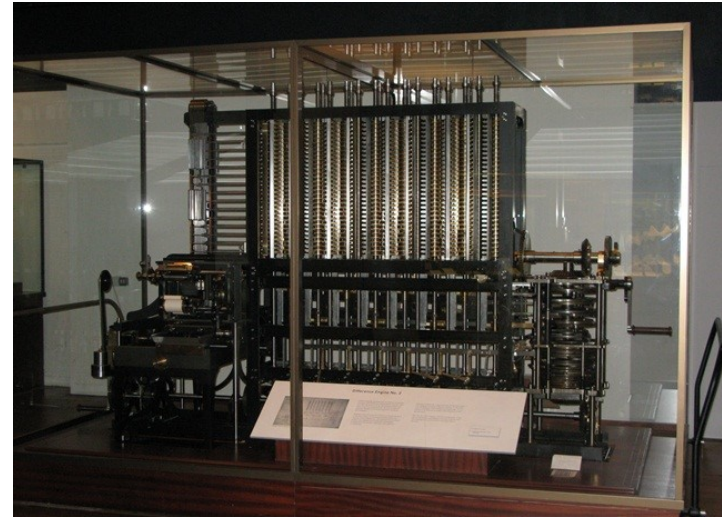


## Analytical engine (1837)

Decimal numerical system

Mecanic computational system

Punched cards







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## *Edith Clark*

Electrical Engineer  
1883-1959

There is no demand for women engineers,  
as such, as there are for women doctors;  
but there's always a demand for anyone  
who can do a good piece of work



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## Clarke calculator (1921-1925)

The device could solve line equations involving hyperbolic functions ten times faster than previous methods. She filed a patent for the calculator in 1921 and it was granted in 1925





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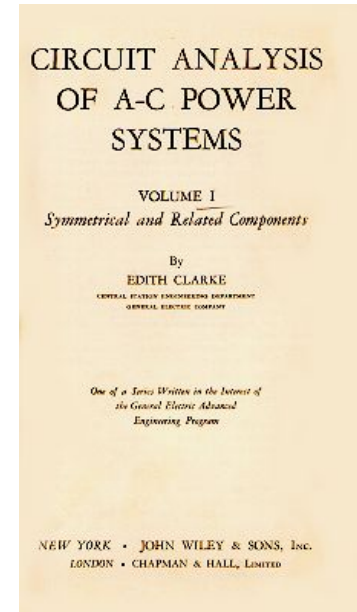


## Publications

American Institute of Electronic Engineers (AIEE --> IEEE).

Circuit Analytics (1943).

Energy Engineering





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## *Rózsa Péter*

Mathematician

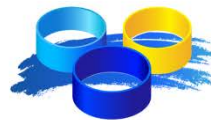
1905-1977

I love mathematics... principally because it is beautiful; because man has breathed his spirit of play into it, and because it has given him his greatest game the encompassing of the infinite.



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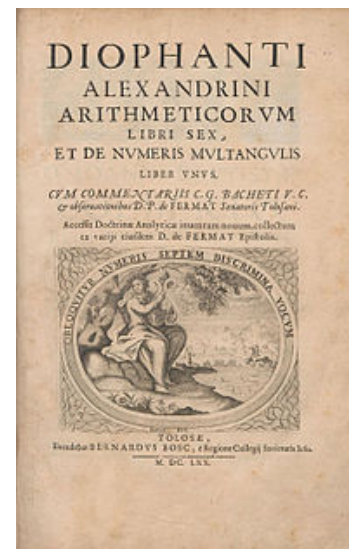


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## Publications

*Playing with Infinity: Mathematical Explorations and Excursions  
(World War II)*





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## Recursive functions theory

To understand recursion, you must first understand recursion





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## *Grace Murray Hopper*

Computation  
1906-1992

*The most damaging phrase in the language  
is: "it's always been done that way"*



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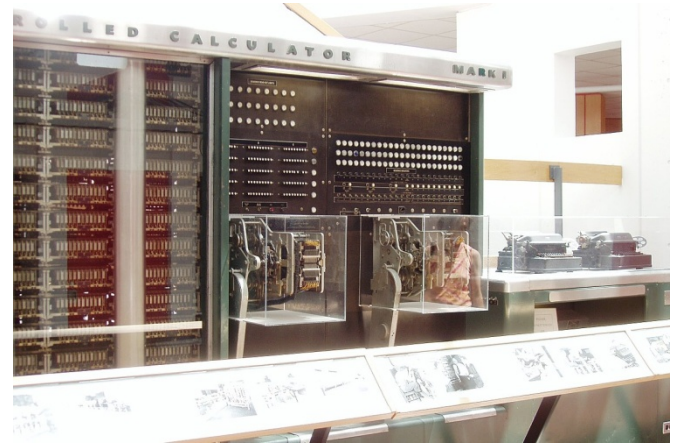


## Mark I

Was built from switches, relays, rotating shafts, and clutches.

765,000 electromechanical components

Hundreds of miles of wire, comprising a volume of 816 cubic feet





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# Compilers

A-0 / B-0

BINAC -UNIVAC


Bug - Mark II

COBOL

FORTRAN

033 PRO 2 2.13047645  
 cond 2.13067645  
 Relays 6-2 in 033 failed special speed test  
 in factory .. 11,00 test.

1100 Started Cosine Tapc (Sine check)  
 1525 Started Multi Adder Test.

1545  Relay #70 Panel F  
 (moth) in relay.

~~1630~~ 1630 First actual case of bug being found.  
 1700 antangut started.  
 1700 closed down.

Relay 3145  
 Relay 3376



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## *Sister Mary Kenneth Keller*

Mathematician and physics  
1913-1985

*We're having an information explosion,  
among others, and it's certainly obvious that  
information is of no use unless it's available*

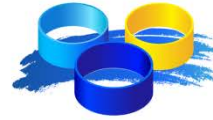


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## Basic

FORTRAN II - ALGOL 60

Time sharing

```
      **** COMMODORE 64 BASIC V2 ****
      64K RAM SYSTEM  38911 BASIC BYTES FREE
READY.
PRINT SQR(2↑2)
2
READY.
PRINT LOG(1)
0
READY.
PRINT 2↑3
8
READY.
PRINT 0.05-0.07+0.02+0
1.09139364E-11
READY.
```



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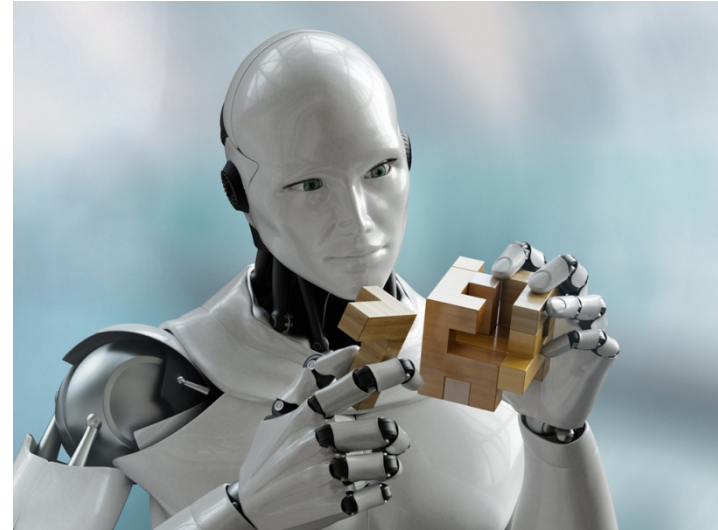


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## Artificial intelligence?

For the first time, we can now mechanically simulate the cognitive process.





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## *Hedy Lamarr*

Actress - Inventor - Engineer  
1914-2000

*Hope and curiosity about the future seemed better than guarantees. The unknown was always so attractive to me... and still is*



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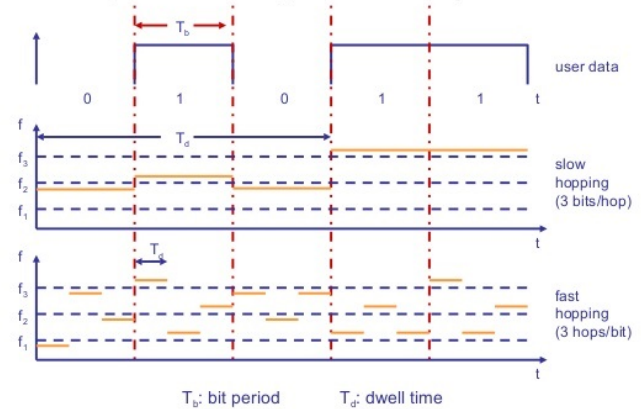
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# FHSS

## Frequency Hopping Spread Spectrum

### FHSS (Frequency Hopping Spread Spectrum) II





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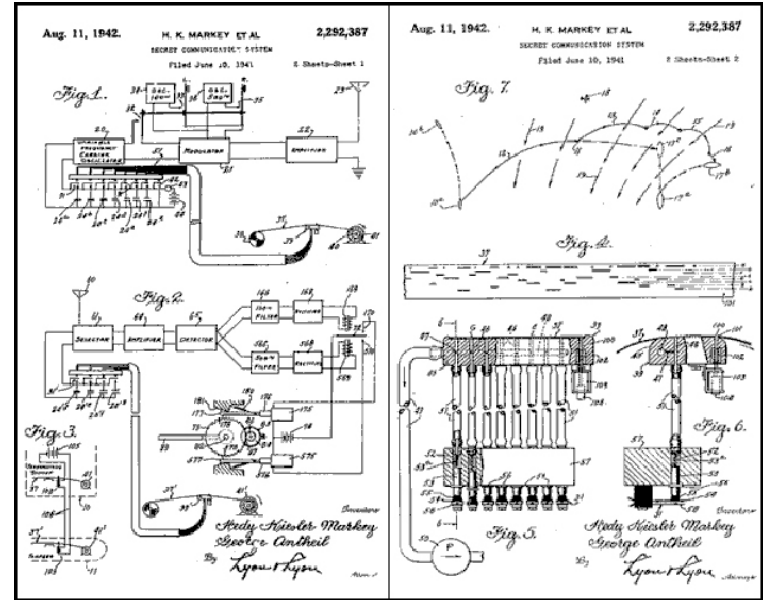
## Patent

802.11

GPS

Bluetooth

Wifi



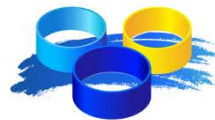


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## *The ENIAC programmers*

1914-1924

Betty Snyder Holberton

Jean Jennings Bartik

Kathleen McNulty

Mauchly Antonelli

Marlyn Wescoff Meltzer

Ruth Lichterman Teitelbaum

Frances Bilas Spence



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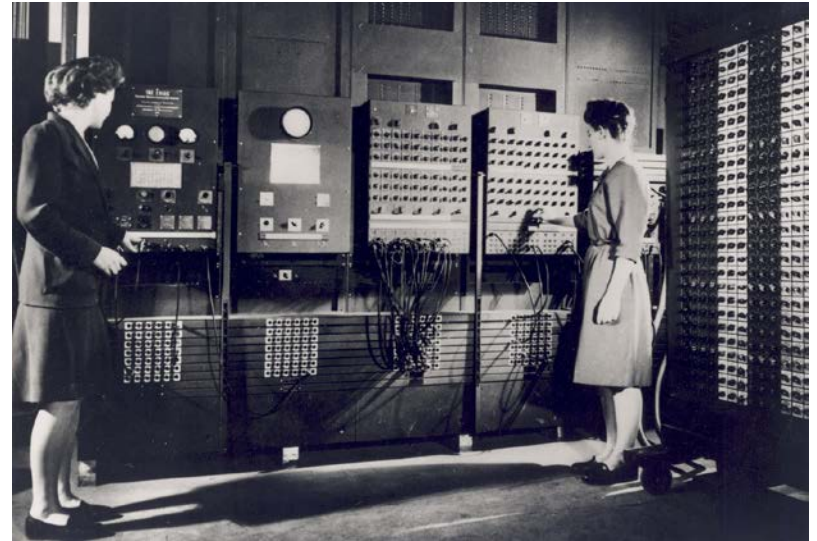


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## ENIAC

- contained 20,000 vacuum tubes
- 7200 crystal diodes
- 1500 relays
- 70,000 resistors
- 10,000 capacitors
- approximately 5,000,000 hand-soldered joints
- It weighed more than 30 short tons (27 t)





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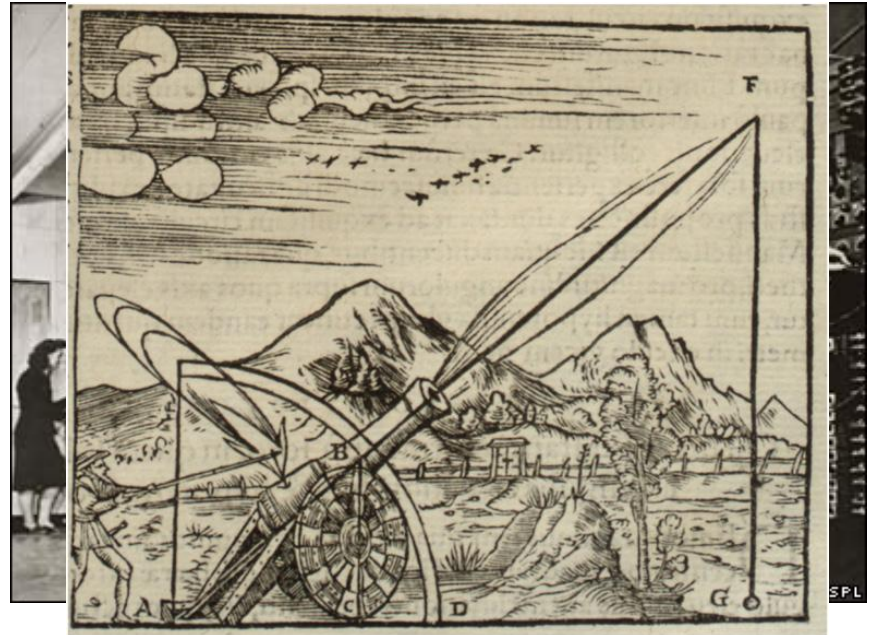


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# ENIAC

Balistic research laboratory





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## *Joan Clarke*

Cryptanalyst  
1917-1996

*Sometimes it is the people no one imagine  
anything of who do the things that no one  
can imagine*



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## Bletchley Park

Government Code and Cypher School (GCCS)





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# Enigma





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*Evelyn Berezin*

Informatics Engineer  
1925

*Achieving a goal provides immediate satisfaction; the process of achieving a goal is a lasting pleasure imagine*



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## Underwood Typewriter Company (1953)





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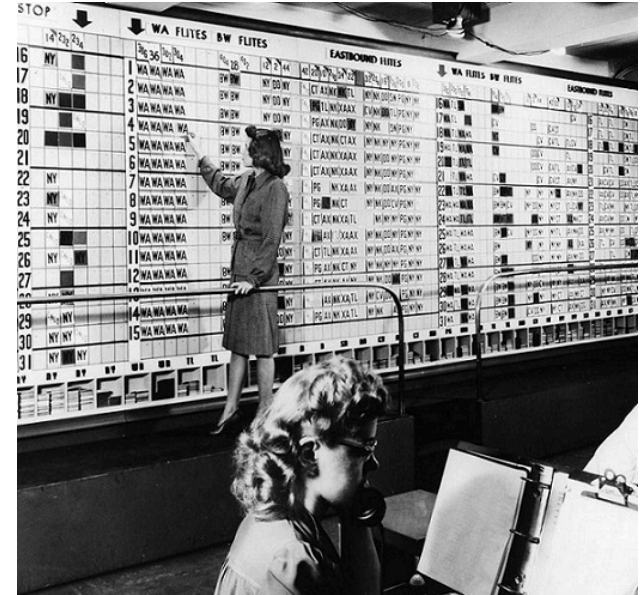
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## Teleregister





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# Word processor





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## *Frances E. Allen*

Informatics Engineer  
1932

*You need to hire and develop great people.  
You need to set the vision and trust them to  
do the right thing. You need to let go of  
control. That's wonderful for all involved  
because you're empowering and trusting  
your people to do what's right for the brand.*



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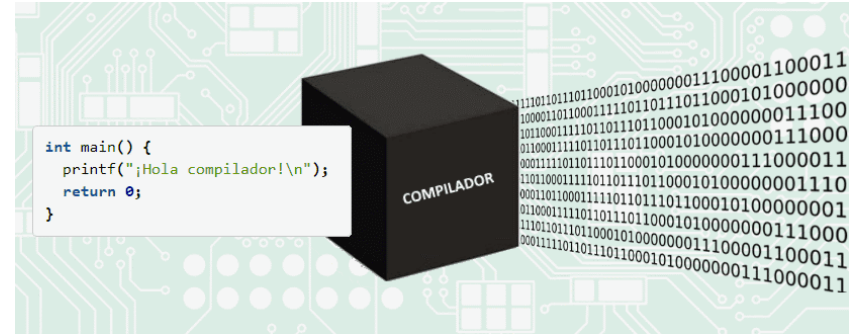
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## Compilers optimization





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## Parallel computing

```

@laughtlin-HP-Pavillon-dv7-Notebook-PC:~$ pstree
psdenManager--2*[{ModemManager}]
networkManager--dbuscli
|   |   |   |   |
|   |   |   |   |---3*[{NetworkManager}]
|   |   |   |   |---dnsmasq
|   |   |   |   |---accounts-daemon--2*[{accounts-daemon}]
|   |   |   |   |---cpid
|   |   |   |   |---vahi-daemon--avahi-daemon
|   |   |   |   |---luetoothd
|   |   |   |   |---land--(cLand)
|   |   |   |   |---blord--2*[{colord}]
|   |   |   |   |---ron
|   |   |   |   |---apps-browsed
|   |   |   |   |---epid
|   |   |   |   |---bus-daemon
|   |   |   |   |---reshclam
|   |   |   |   |---*[{getty}]
|   |   |   |   |---home-keyring-d--5*[{gnome-keyring-d}]
|   |   |   |   |---rgbalance
|   |   |   |   |---erneLoops
|   |   |   |   |---lightdm
|   |   |   |   |---Xorg--(Xorg)
|   |   |   |   |---lightdm--init
|   |   |   |   |   |---at-spi-bus-laun--dbus-daemon
|   |   |   |   |   |   |---2*[{at-spi-bus-laun}]
|   |   |   |   |   |   |---at-spi2-registr--at-spi2-registr
|   |   |   |   |   |   |---banfdaemon--3*[{banfdaemon}]
|   |   |   |   |   |   |---chronlun-browse--chronlun-browse--2*[{chronlun-browse--8*[{chronlun-browse}]]
|   |   |   |   |   |   |   |---chronlun-browse--chronlun-browse
|   |   |   |   |   |   |   |   |---2*[{chronlun-browse}]
|   |   |   |   |   |   |   |---34*[{chronlun-browse}]
|   |   |   |   |   |   |---2*[{dbus-daemon}]
|   |   |   |   |   |   |---dbus-launch
|   |   |   |   |   |   |---dconf-service--2*[{dconf-service}]
|   |   |   |   |   |   |---evolution-calen--4*[{evolution-calen}]
|   |   |   |   |   |   |---evolution-sourc--2*[{evolution-sourc}]
|   |   |   |   |   |   |---Firefox--46*[{Firefox}]
|   |   |   |   |   |   |---gconfd-2
|   |   |   |   |   |   |---geoclue-master--2*[{geoclue-master}]
|   |   |   |   |   |   |---gnome-session--complz--7*[{complz}]
|   |   |   |   |   |   |---deja-dup-monito--2*[{deja-dup-monito}]

```



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## *Annie Easley*

Mathematician- Informatics  
1933-2011

*ou're never too old, and if you want to, as  
my mother said, you can do anything you  
want to, but you have to work at it*



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## NACA-NASA

Centaur rocket project

Satelites (communications, military and weather)





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NASA

Cassini Probe





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## *Margaret Hamilton*

Mathematician- Informatics  
1936

*I began to use the term “Software Engineering” to distinguish from hardware and other kinds of engineering. When I first started using this phrase it was considered to be quite amusing. Software eventually and necessarily gained the same respect as any other discipline*



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Apolo

Exeptions

Asynchronous task loading





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## SkyLab

SL-1. Saturn V rocket

SL-2. Apolo, Saturno IB rocket

SL-3. Apolo, Saturno IB rocket

SL-4. Apolo, Saturno IB rocket





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## *Lynn Conway*

Computer Scientist – Electrical Engineer  
1938

*It's like building bridges... people can say the design stinks, or your ideas aren't good. But if the bridge stands, it stands. What works, works*





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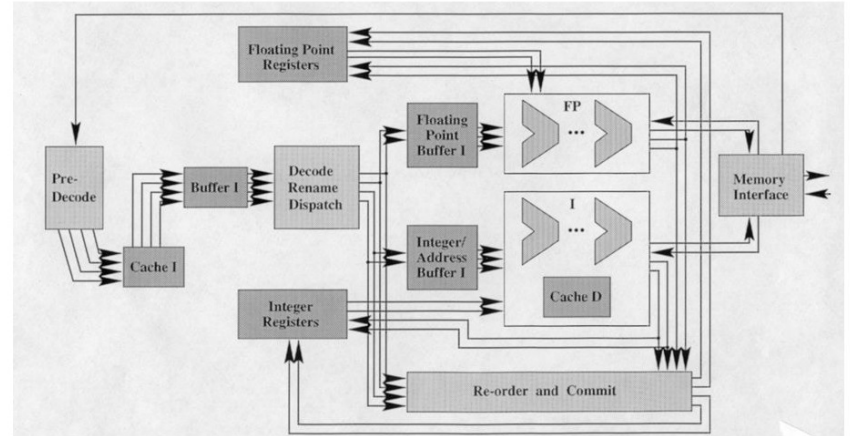


IBM

Computers Architecture

Advance Supercomputers

ACS engines - Superscalars





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Xerox Park

VLSI





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## *Radia Perlman*

Mathematician - Computing Sciences  
Networks engineer  
1951

*When a bunch of musicians are playing together, it is just like a network, where each component, each instrument is doing their own piece, their own portion of the greater goal and somehow it just all fits together*



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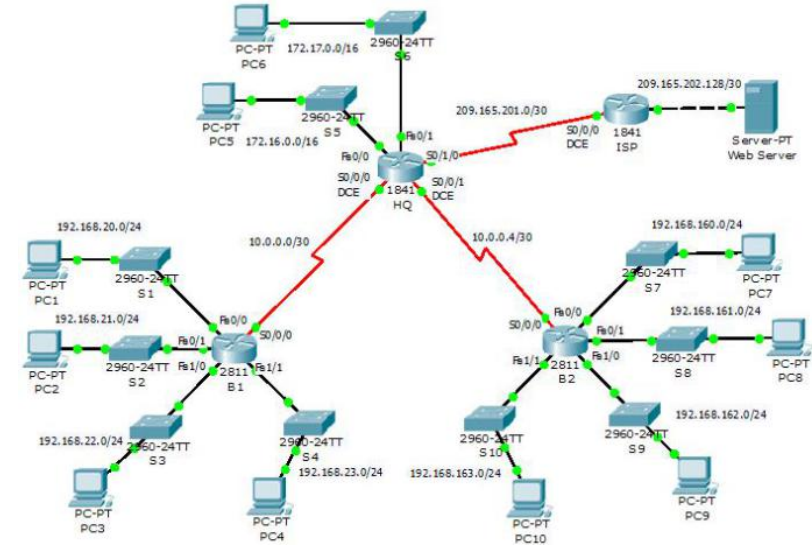
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STP

Layer 2 - OSI model

Data link layer



# Women in tech Success in the shadow

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