History of the Supercomputers

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CADMOS

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Summary

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Outline

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From “computer” and “supercomputer” definitions...

- Faster than human being
- Electronic machine
- Digital processing of the information
- Stored program
- Execution of instructions
- Huge computational power
- Small cycle times
- Huge resources
- Parallel operations

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Outline

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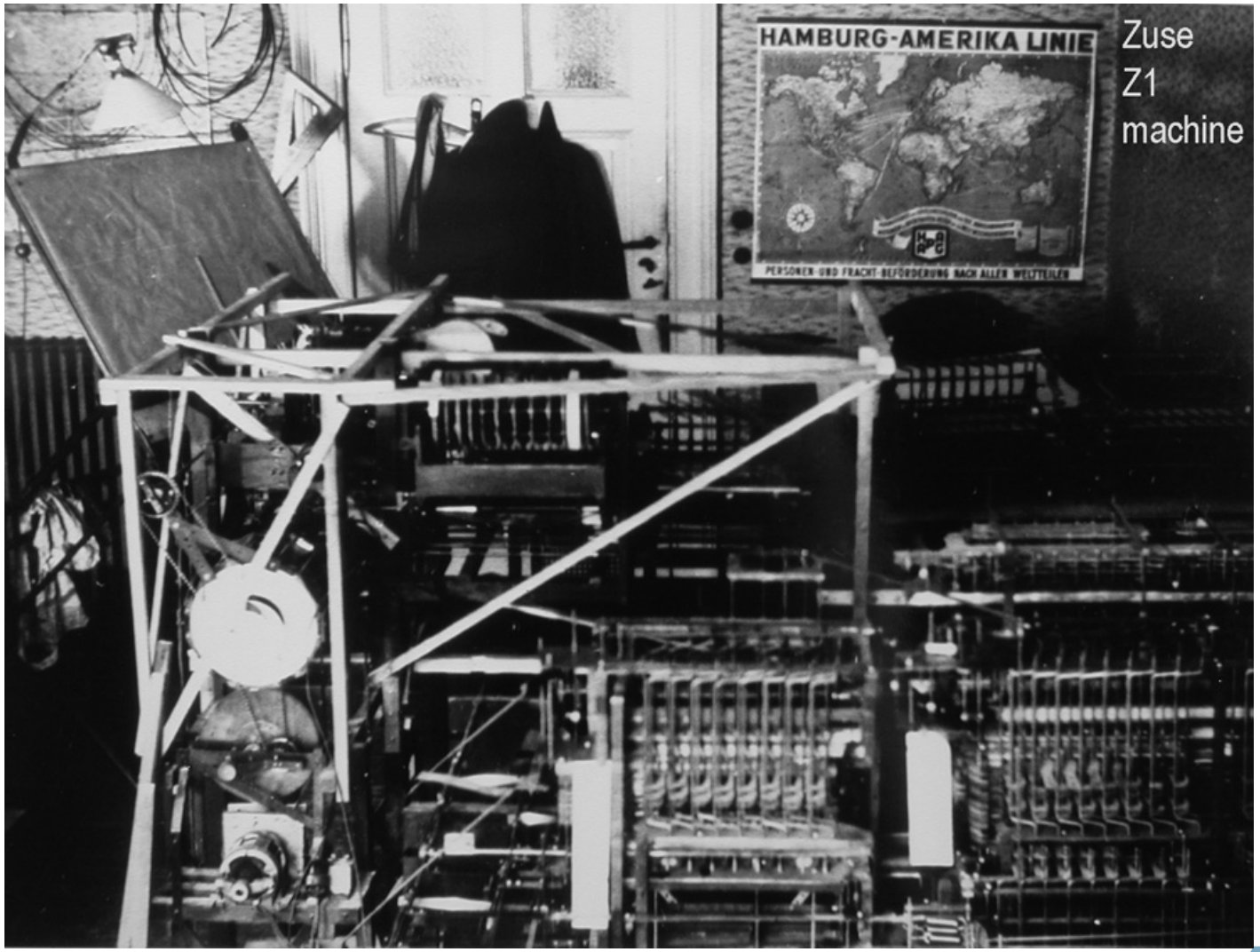
1937 : FASTER THAN HUMAN BEING

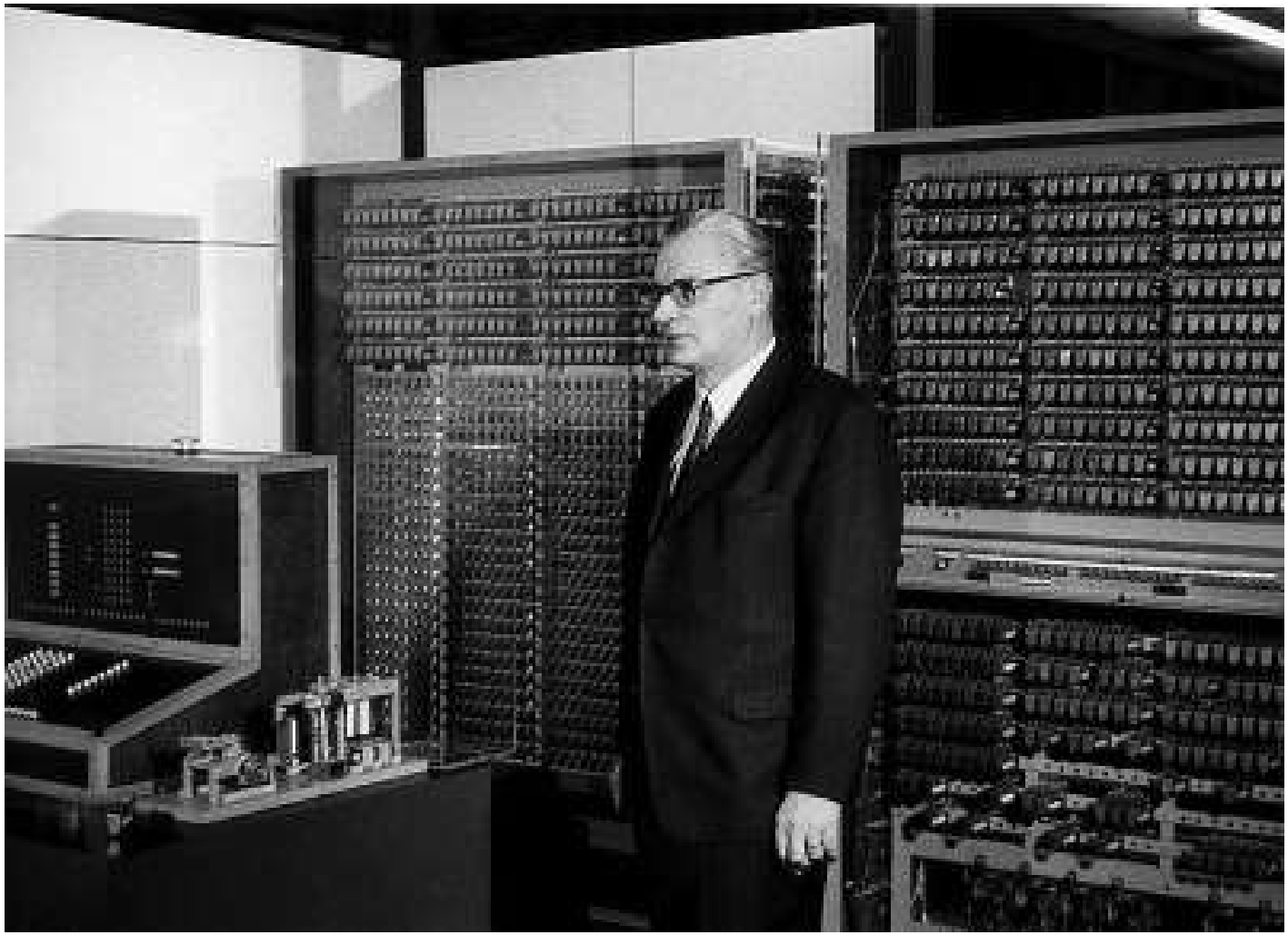
1937 Z1 : mecanical machine



http://www.horst-zuse.homepage.t-online.de/z1.html

1941 : ELECTRO-MECANICAL MACHINE (relays + mecanics)

1941 Z3 : electro-mechanical



http://www.horst-zuse.homepage.t-online.de/z3.html

1944

FULL ELECTRONIC MACHINE
(vacuum tubes)
DIGITAL PROCESSING
(Military classified machines)

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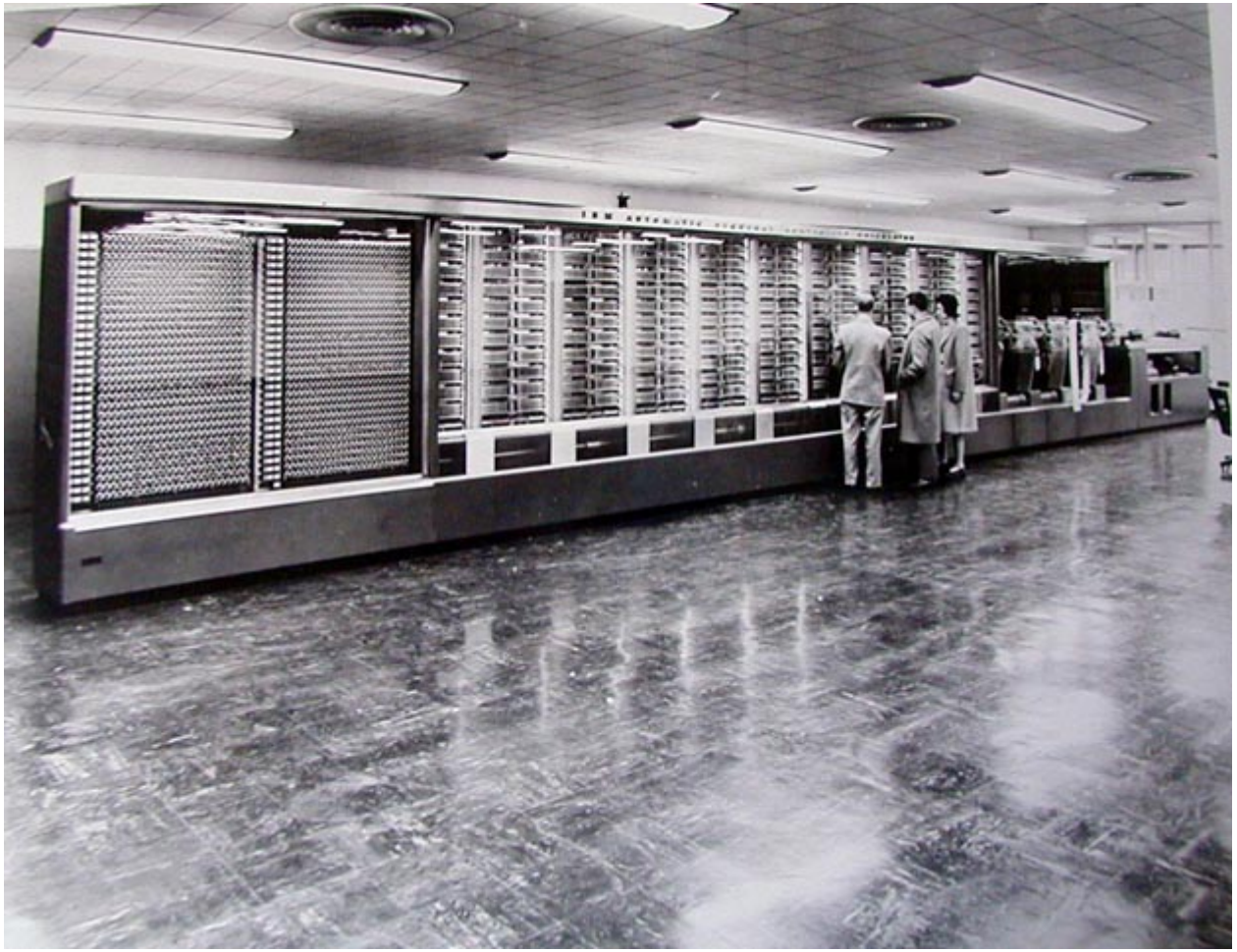
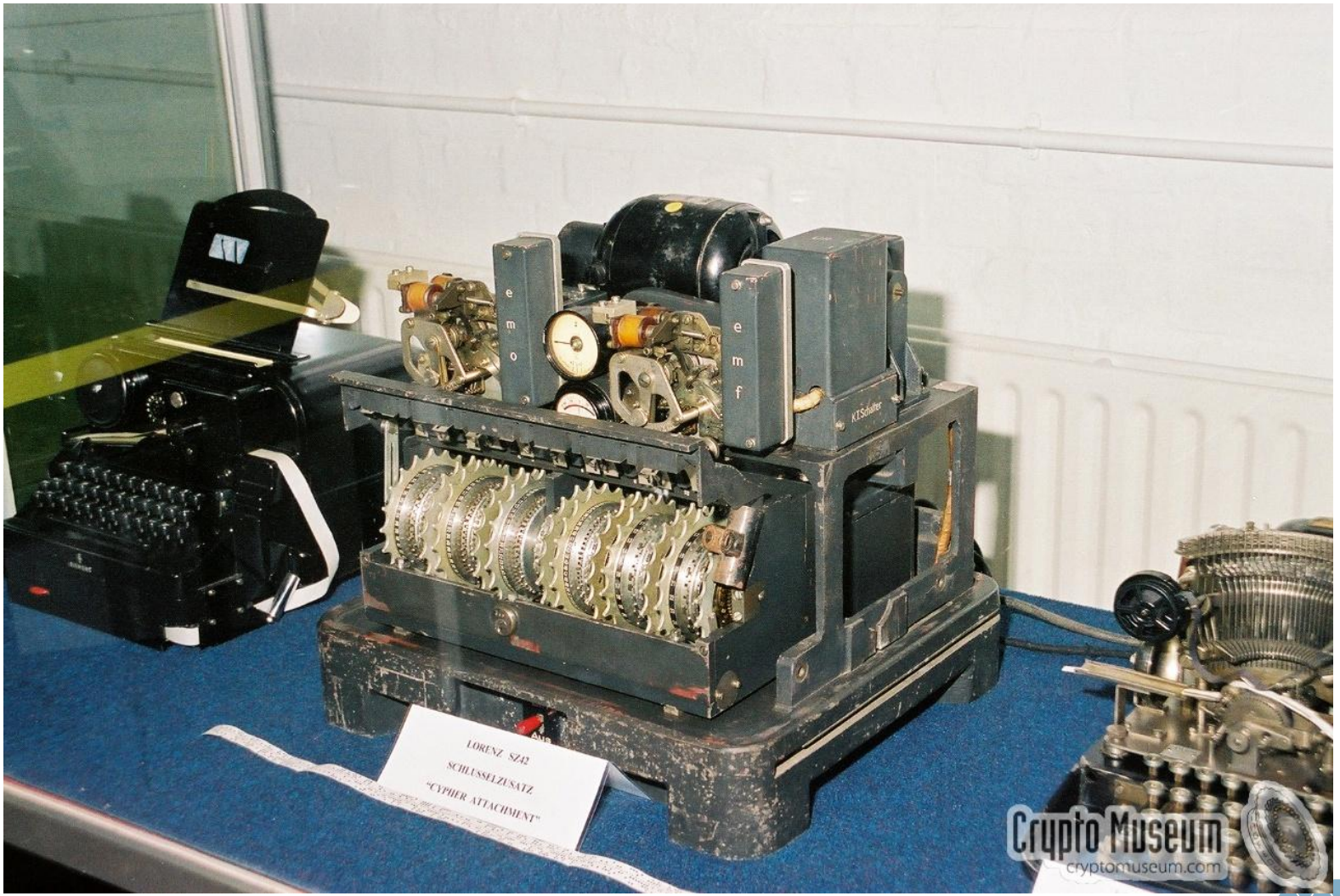
1944 Harvard MARK 1 (IBM ASCC) : *ballistics and warship design*



http://www.computermuseum.li

1942 ENIGMA, Lorentz SZ/42



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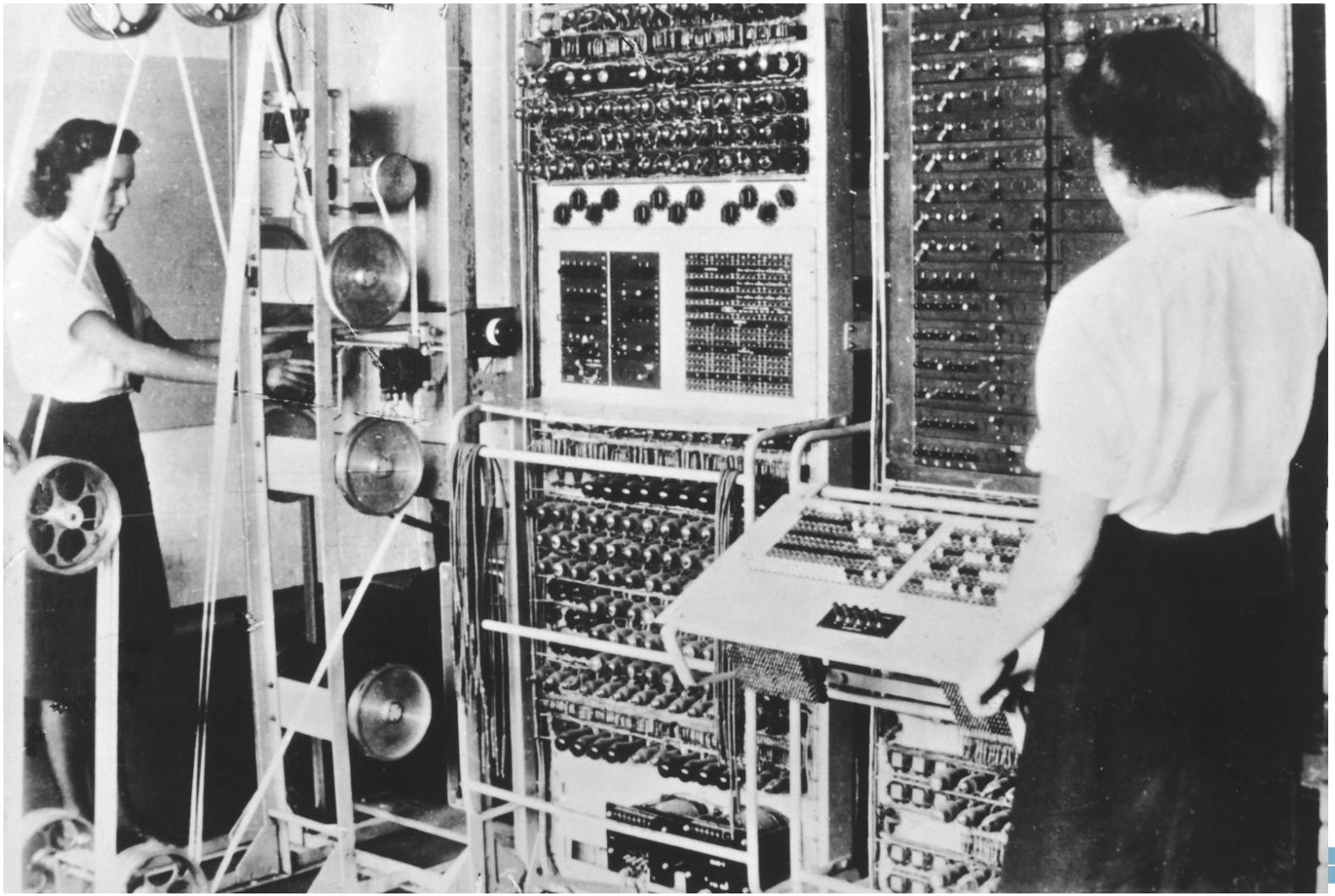
http://www.cryptomuseum.com

1944 Colossus : decypher Nazis codes



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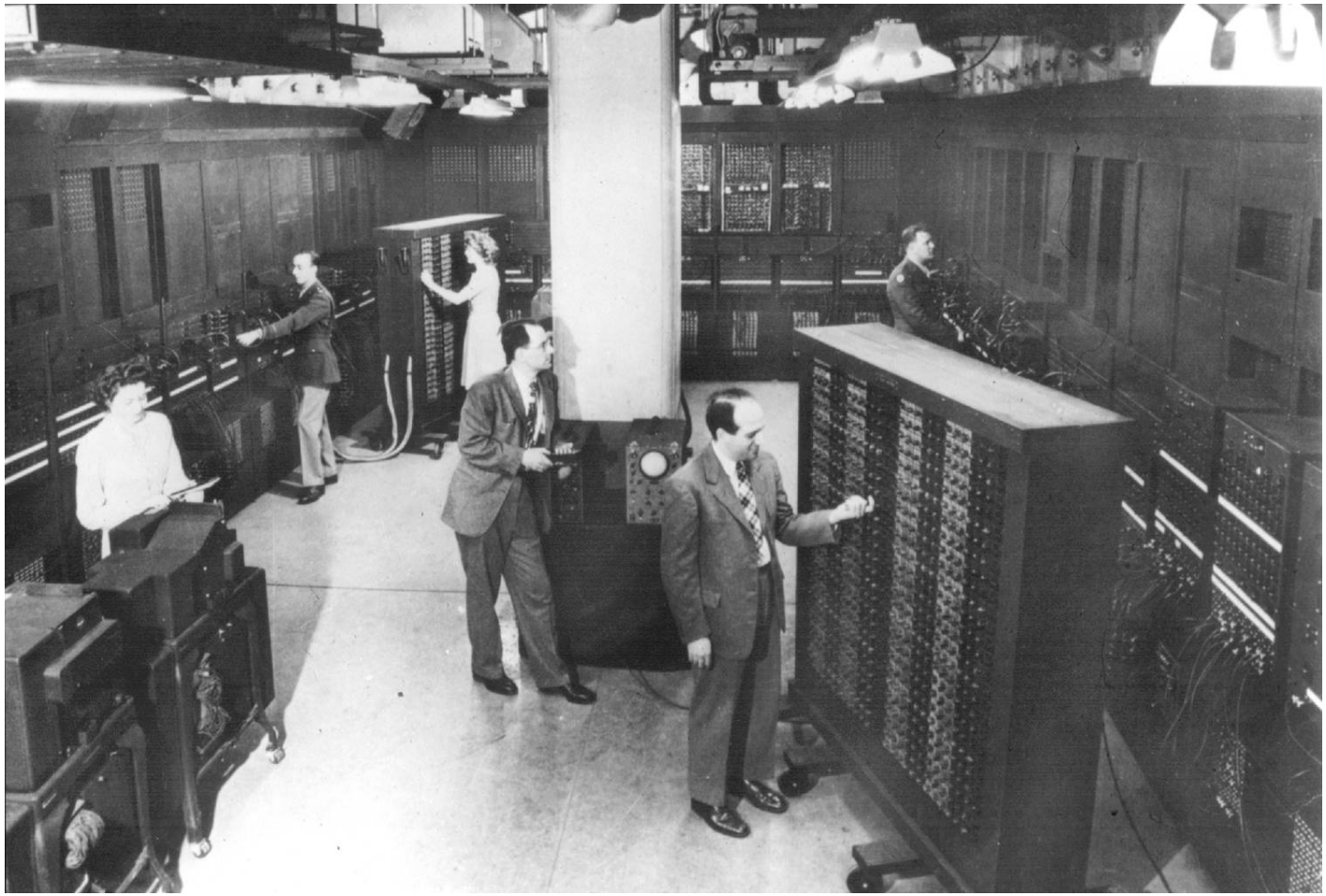
1946 ENIAC, full electronic, first Turing-complete



http://www.fi.edu/learn/case-files/eckertmauchly/ENIAC_Image_2.jpg

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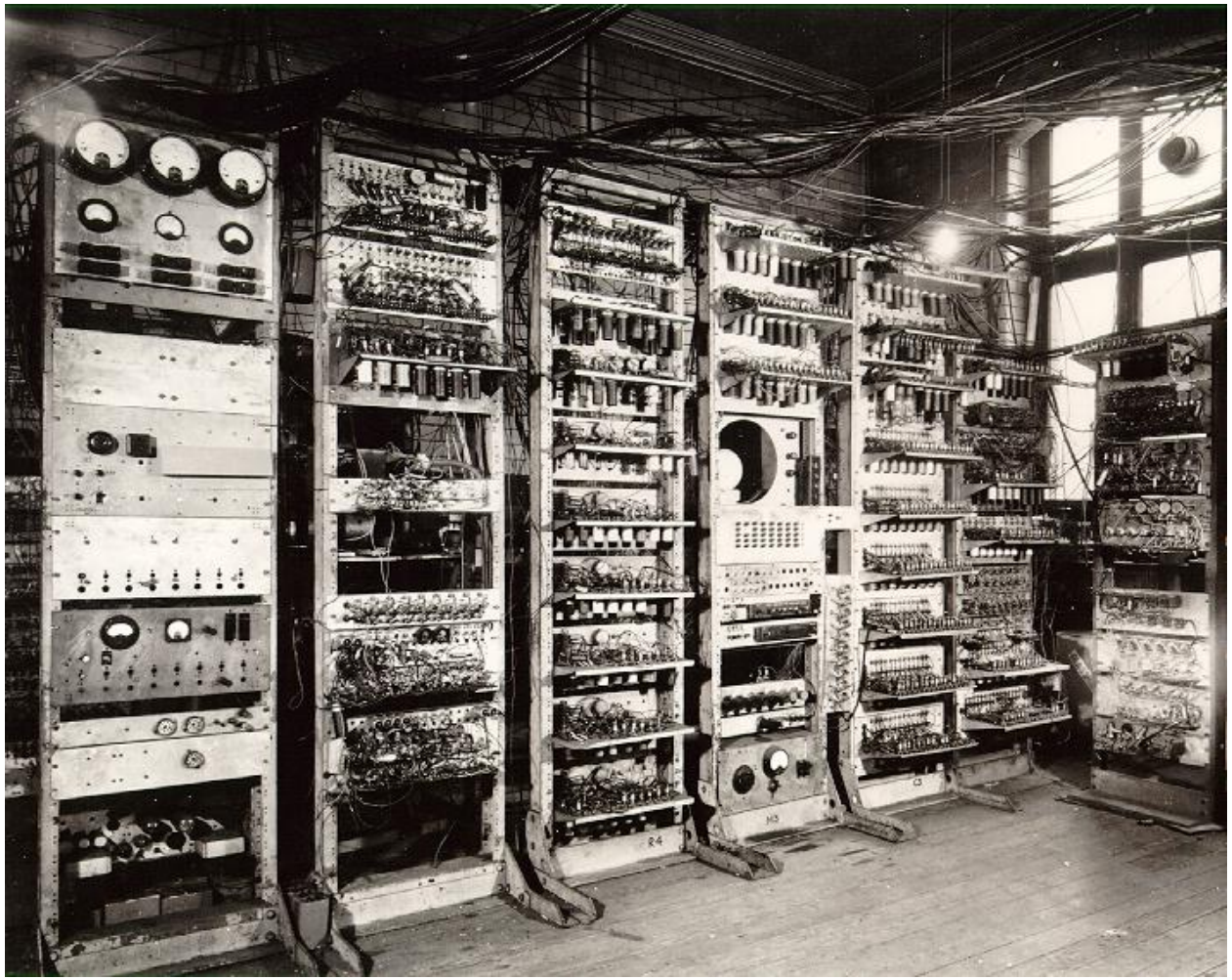
1948 : STORED PROGRAMS

1948 Manchester MARK 1 : stored programs



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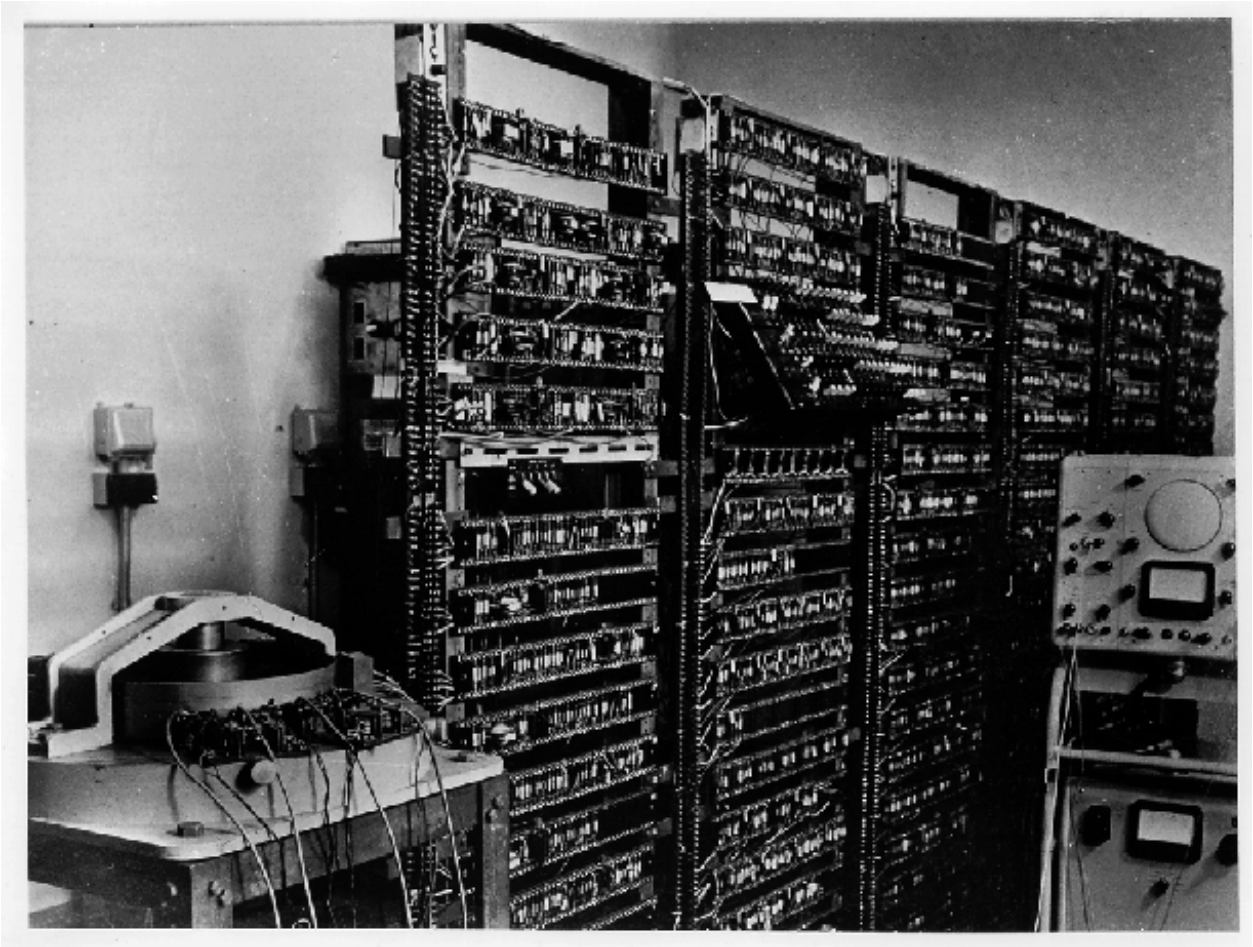
1954 : FIRST COMMERCIAL SUCCESS

1954 IBM 701 : First commercial success

http://www.columbia.edu

1955 : FROM VACUUM TUBES TO TRANSISTORS

1953 University of Manchester Experimental Transistor Computer



Outline

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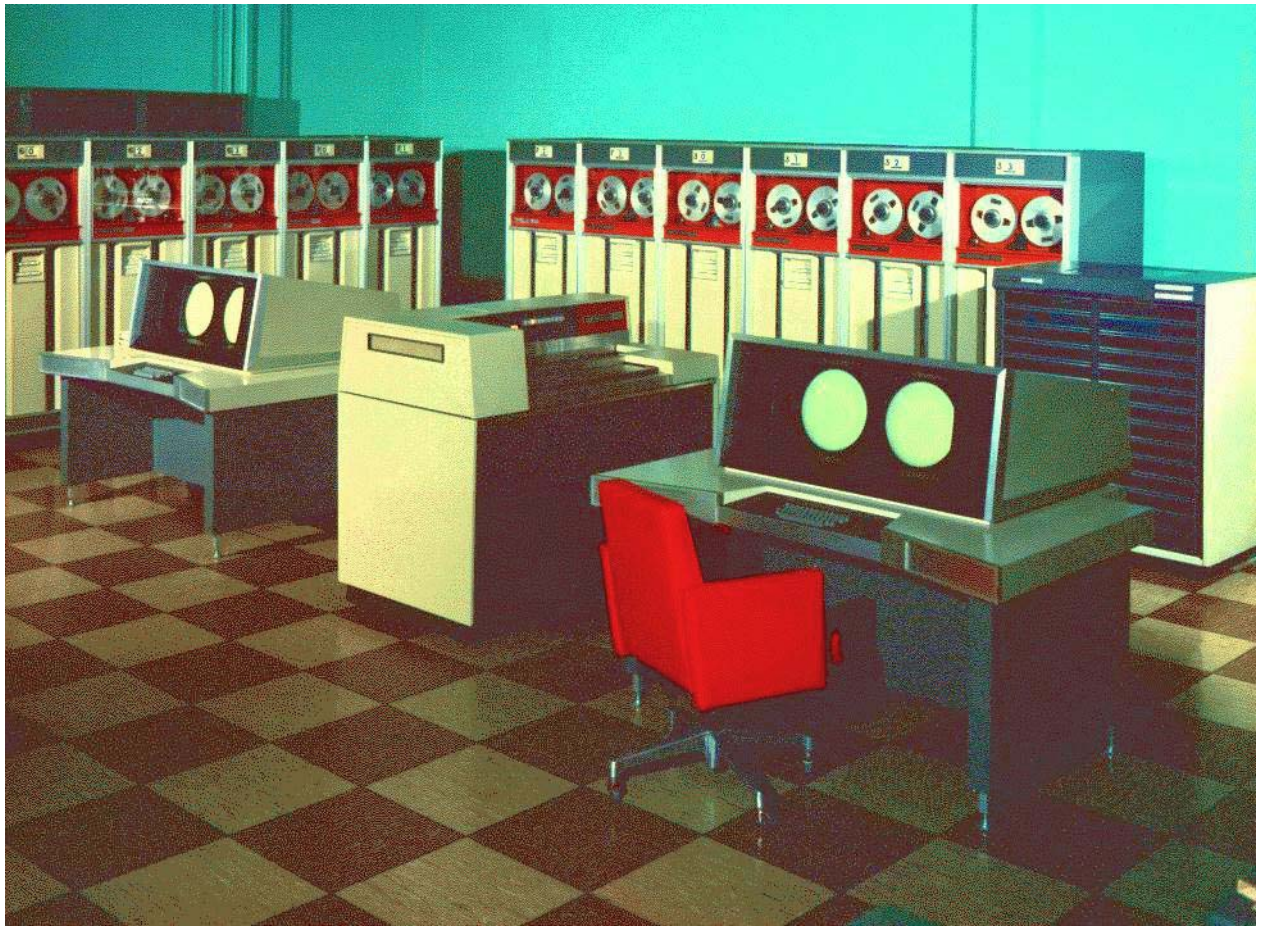
1965 : PARALLEL OPERATIONS

1965 CDC 6600 : First commercial supercomputer



http://www.computer-history.info

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1976 : VECTOR ARCHITECTURE

1976 Cray 1 : The revolution

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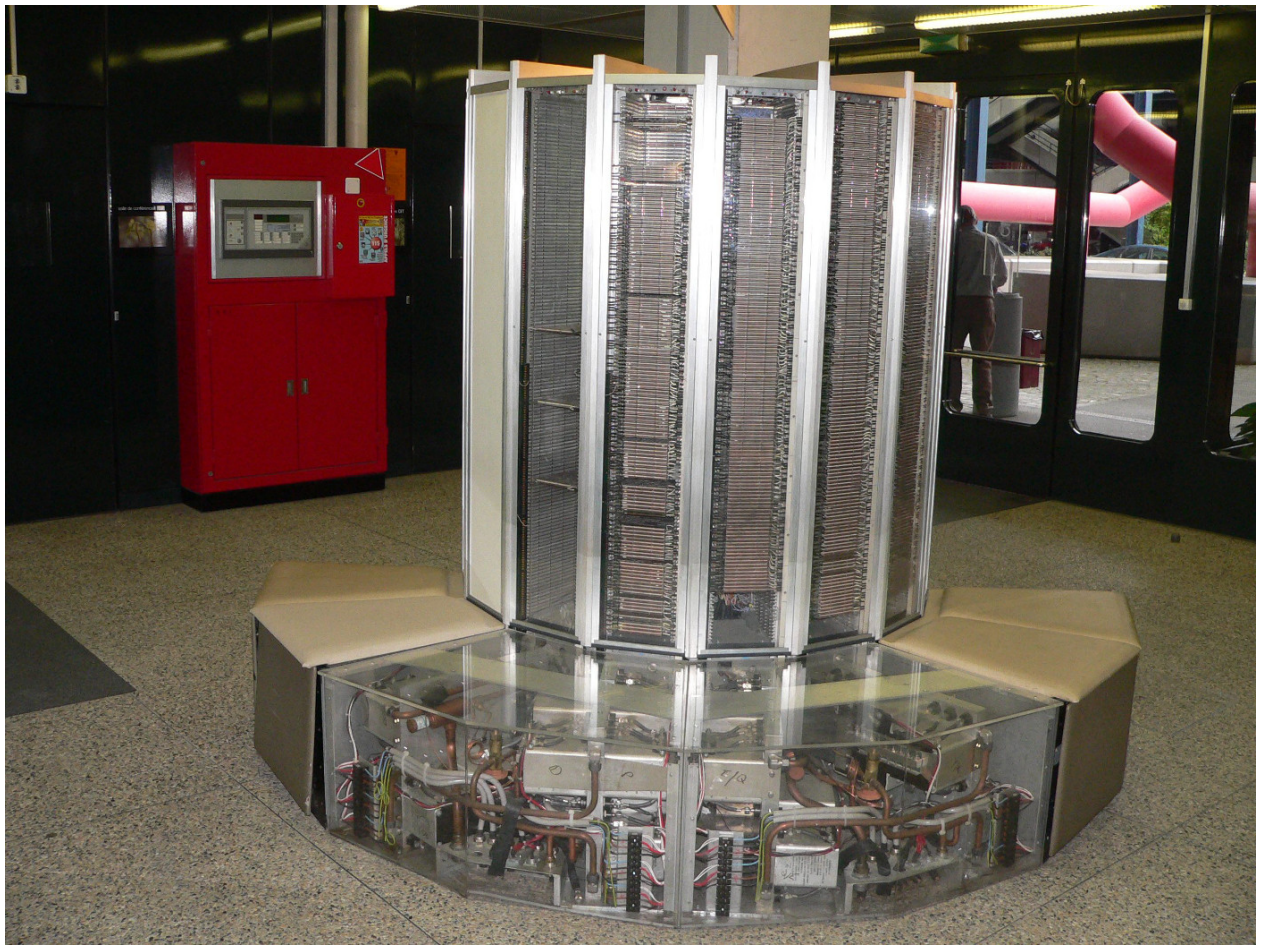
Cray 1 at EPFL



http://www.epfl.ch

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1982 : PARALLEL VECTOR PROCESSORS

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1982 Cray X-MP : Parallel vector CPUs

http://www.craysupercomputers.com

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Cray X-MP at EPFL (originally from CERN)

http://www.epfl.ch

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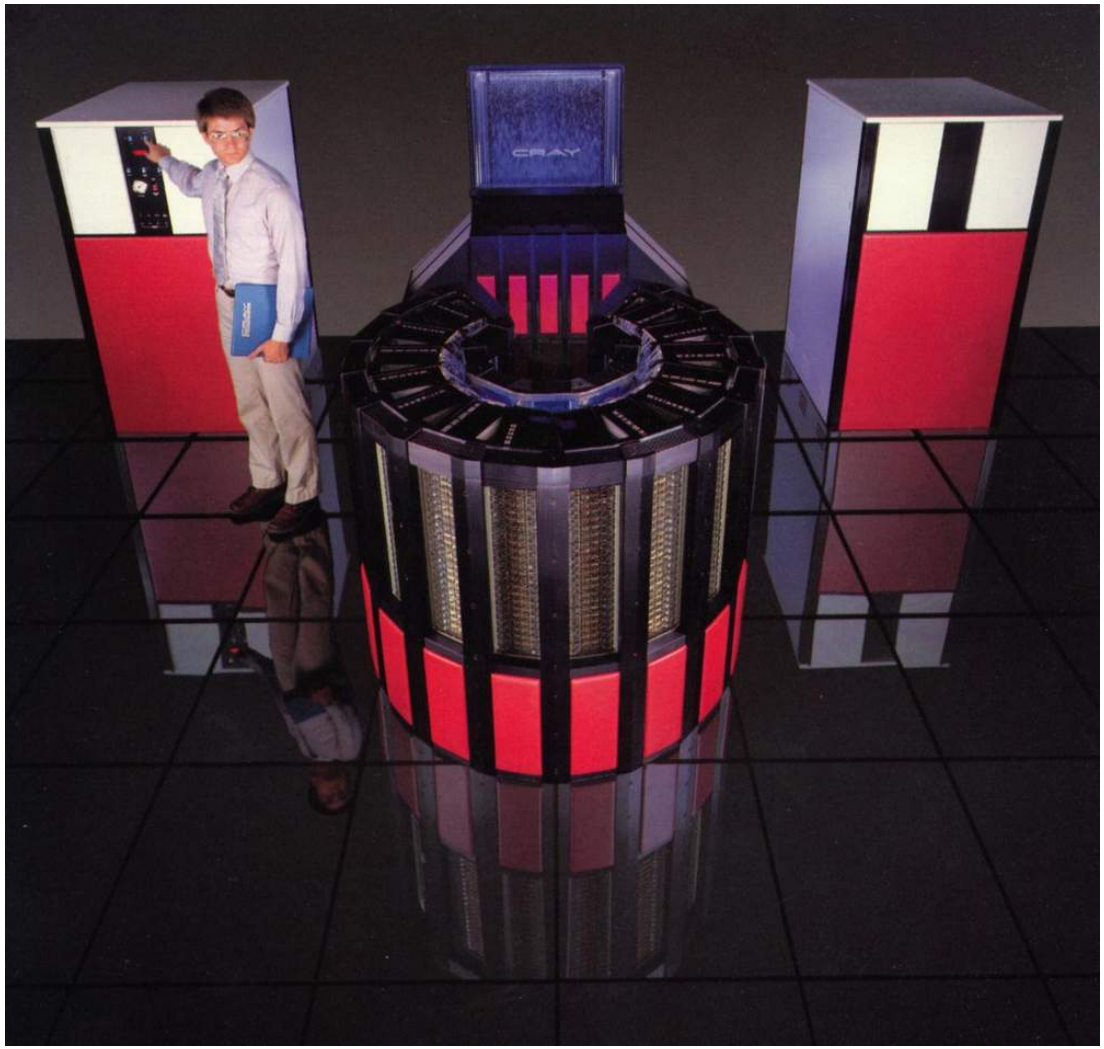
1985 Cray 2 : Very large memory (2 GB)



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http://www.craysupercomputers.com

Cray 2 at l’EPFL

http://www.epfl.ch

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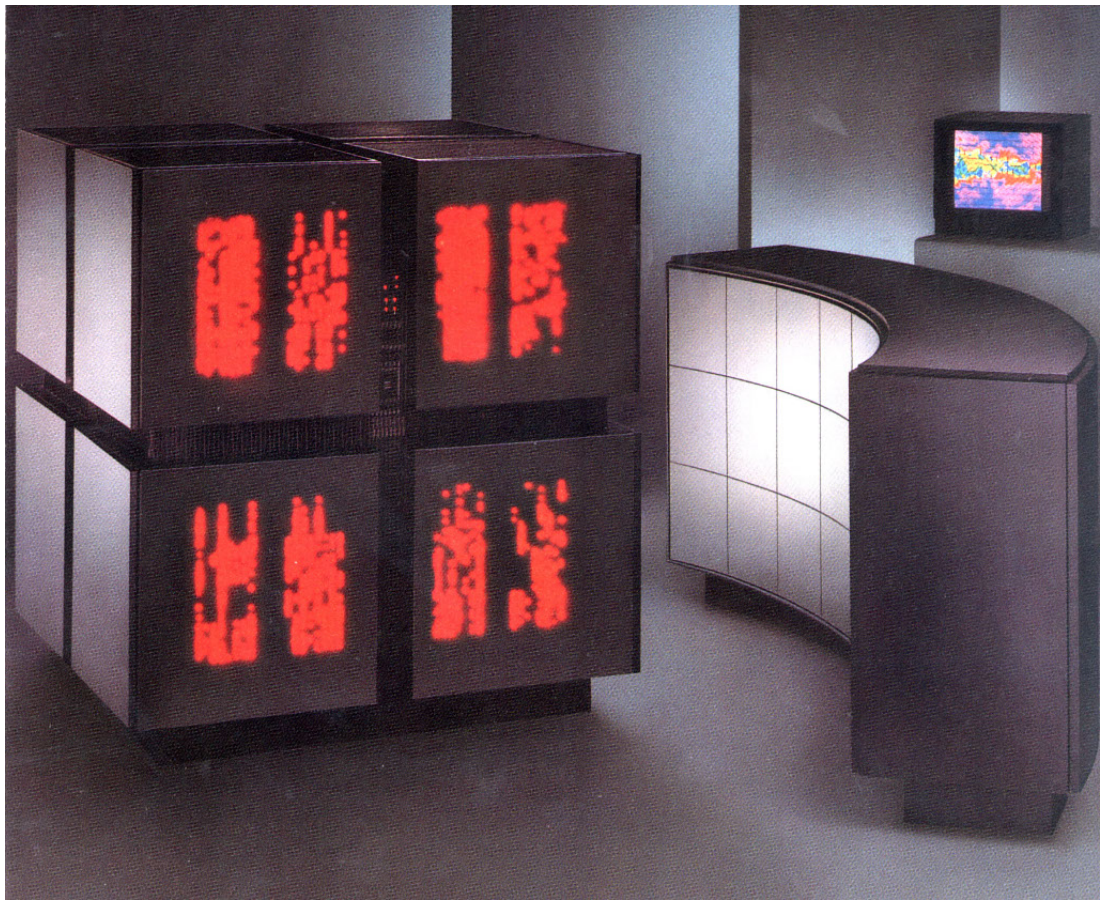
1987 : MASSIVELY PARALLEL MACHINES

1987 CM-2 : a visionnary idea



http://www.new-npac.org

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1993 : BEGINNING OF TOP500

1993 CM-5 : Very first #1 TOP500

Thinking Machines brochure

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mid nineties

END OF PROPRIETARY DESIGN.
OPEN-SOURCE (real) BIRTH

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1994 NASA Goddard : Thomas Sterling starts waste recovery

http://www.nasa.gov

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mid 2000's : MULTI-CORES NODES

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2012 Bellatrix : A standard cluster

http://hpc.epfl.ch

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2005 : MASSIVELY PARALLEL, MULTI-CORES NODES

2005 IBM BlueGene/L : 16'384 nodes

http://hpc.epfl.ch

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2008 IBM BlueGene/P : An evolution

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2011 IBM BlueGene/Q : A revolution

http://hpc.epfl.ch

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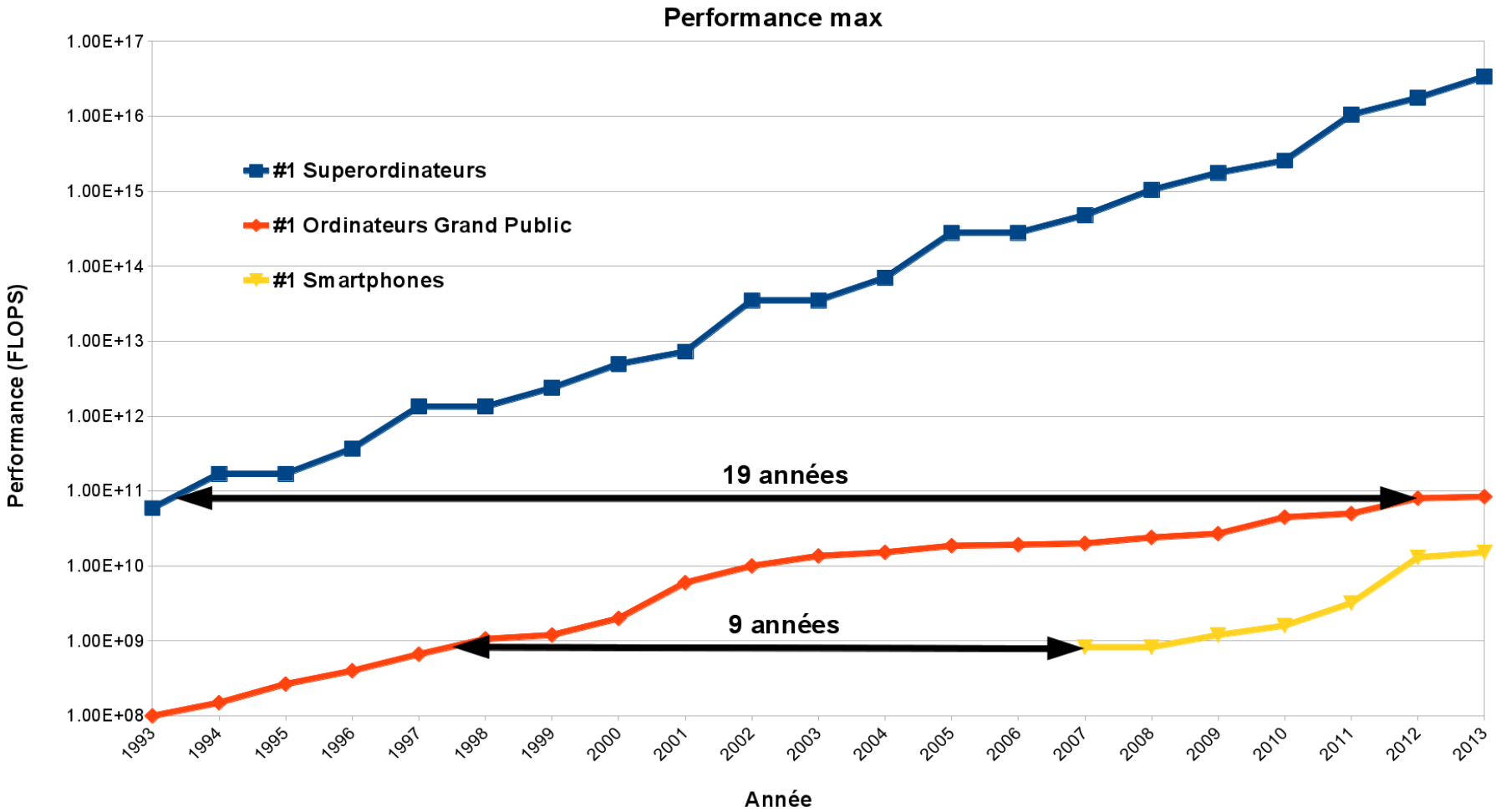
Peak performance : An interesting comparison



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Cray XT4

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Thanks
Questions ?

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