


*Life and work
of
Enrico Fermi
1901-1954*

Hugo van Dam




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Fermi excelled in theory and experiment:

- Quantum physics
- Nuclear and particle physics
- Statistical mechanics
- Cosmic radiation
- First nuclear reactor
- “Engineer” with 14 patents (12 about reactors)

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Fermi-Dirac distribution

Fermi = F = 10^{-15} m

Fermions

Fermium = ${}_{100}\text{Fm}$

Fermi acceleration

Fermi age equation

Fermi laboratories, NPPs, Space
Telescope

Fermi Prize

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1921 First publication

1922 PhD

1924 4 months in Leiden (Ehrenfest)

1925 Publ. Fermi-statistics,
independently also by Dirac

1926 Professorship in Rome

1934 Theory β -decay with neutrino

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Neutrino: postulate from Pauli, naming by Fermi and used in his theory of β -decay; detected not until 1955.

Nature rejected his publication:

“Too unrealistic to be interesting for our readers”

From 1934 on: research with neutrons.

“Accidental” discovery of moderation

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1938 Nobel Prize for “production of new radioactive elements with neutrons, in particular with slow neutrons”. Missed discovery of nuclear fission !

1938 Discovery of nuclear fission

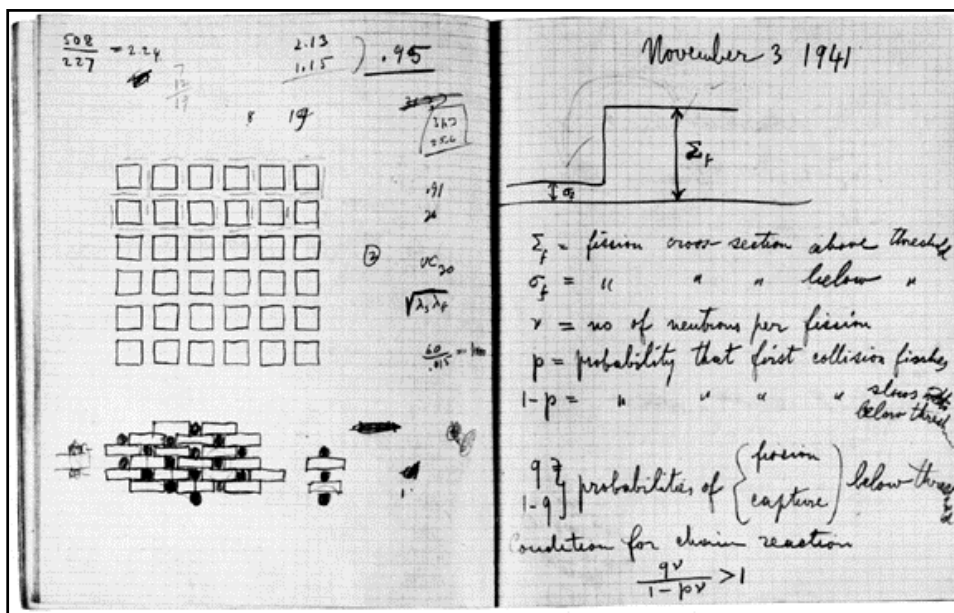
1941- 42 Series of subcritical experiments

2 dec. 1942 first nuclear reactor: CP-1

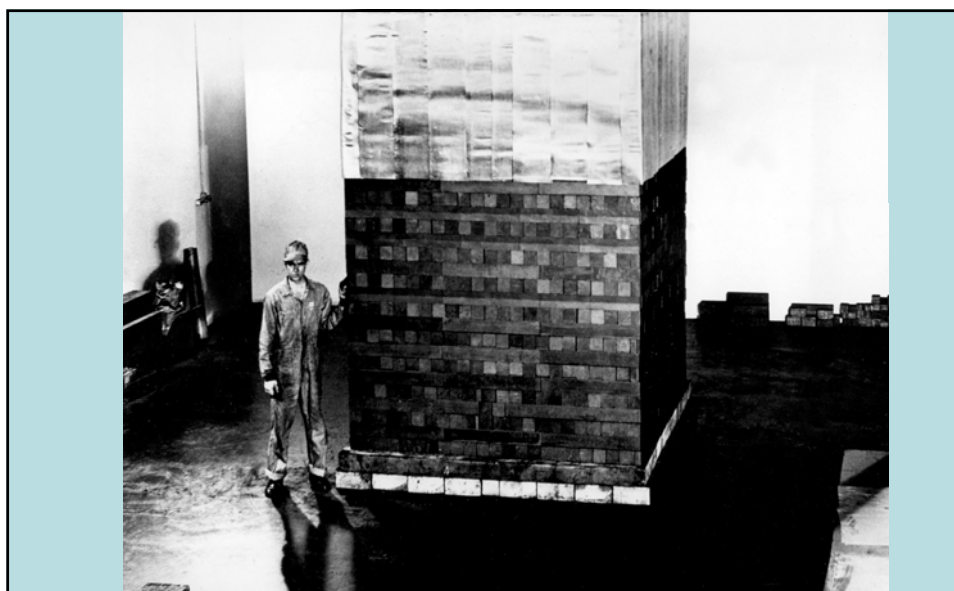
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1960-1962

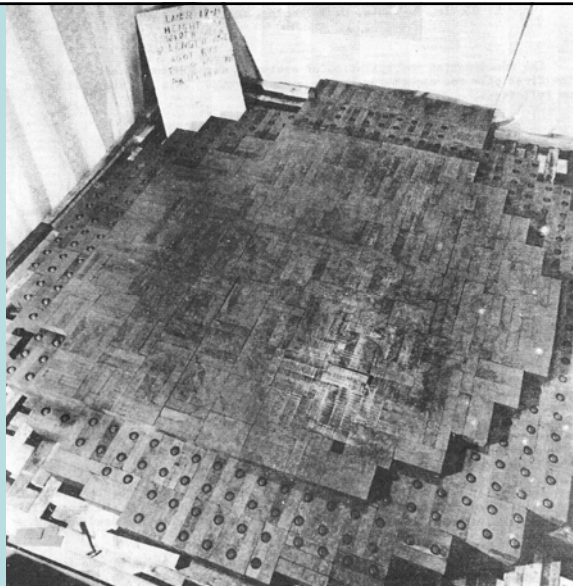
26 metric tons of
graphite +
2 tons of U:

$k = 0,76$

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Building up to:

380 ton graphite

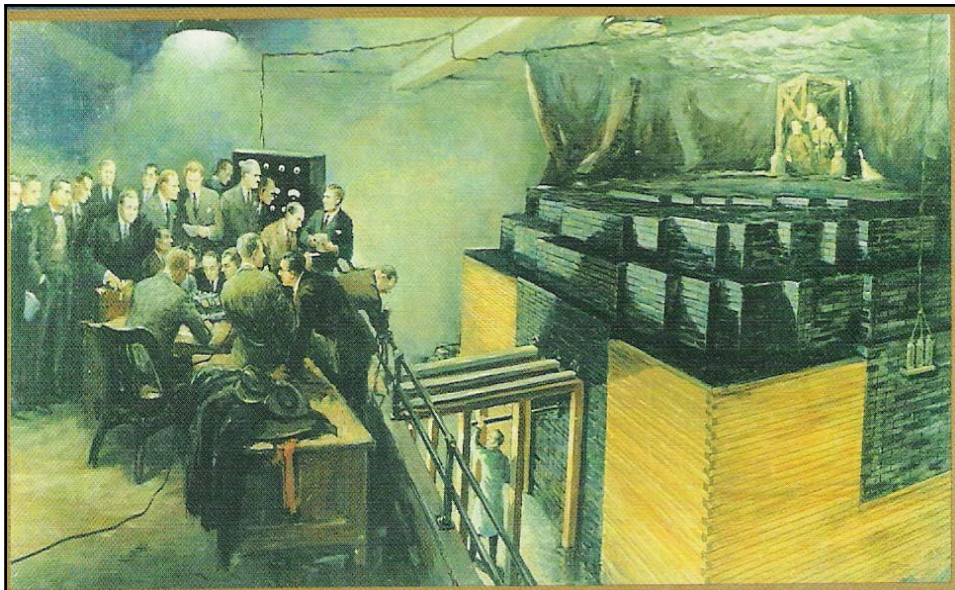
40 ton UO₂

6 ton U

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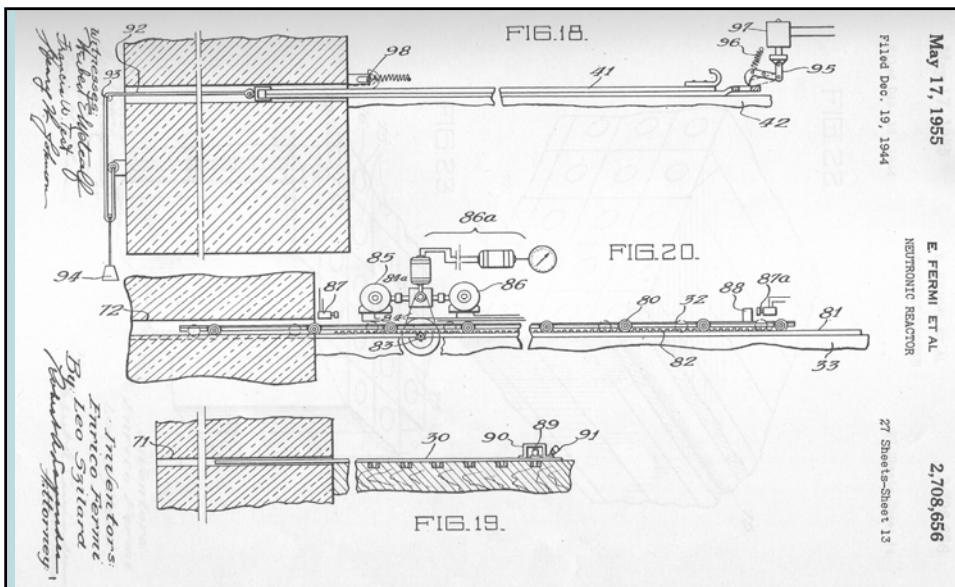
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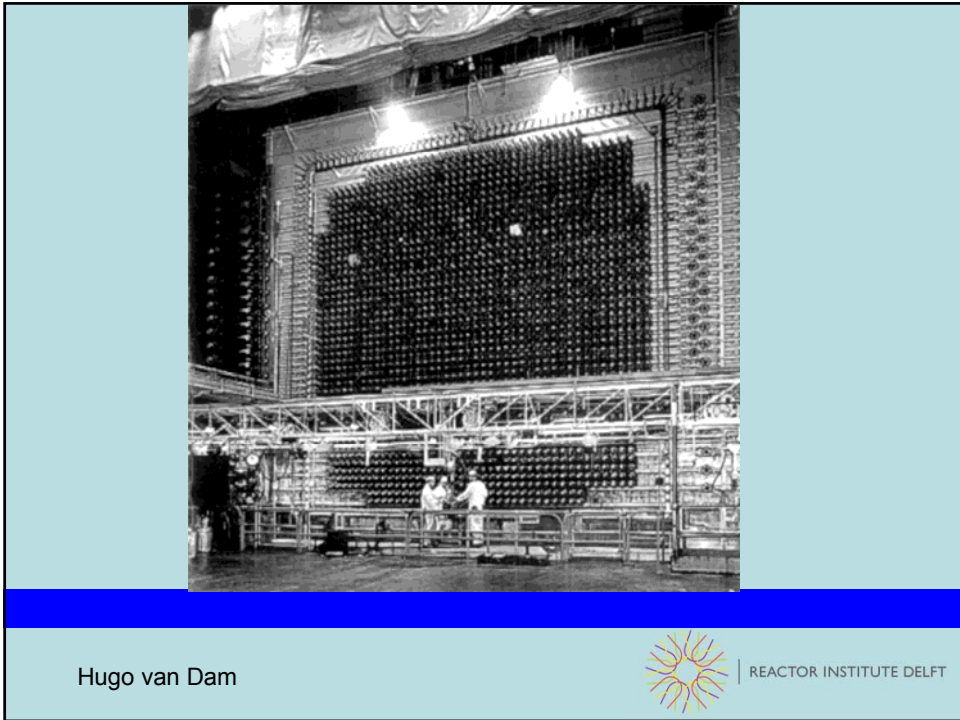
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Enrico Fermi:
“Father of the
nuclear reactor”

Hugo van Dam



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