

研究這檔事...



光電系 賴昆佑

5.19.2019

What defines a good research ??

Albert Einstein

University of Zurich (蘇黎世聯邦理工學院
=> 蘇黎世大學, QS全球排名: 76)



The amazing 1905:

1. On a Heuristic Viewpoint Concerning the Production and Transformation of Light
(論光的產生和轉化的試探性觀點) → 光電效應
2. A new determination of molecular dimensions
(判定分子大小的新方法) (博士論文)
3. On the Motion of Small Particles Suspended in a Stationary Liquid, as Required by the Molecular Kinetic Theory of Heat
(論靜液體中懸浮粒子的運動) → 布朗運動
4. On the Electrodynamics of Moving Bodies
(論動體的電動力學) → 狹義相對論
5. Does the Inertia of a Body Depend Upon Its Energy Content? (物體的慣性與它的能量有關嗎?) → $E = mc^2$

Enrico Fermi

Scuola Normale Superiore di Pisa

(比薩高等師範學校, QS全球排名: NA)

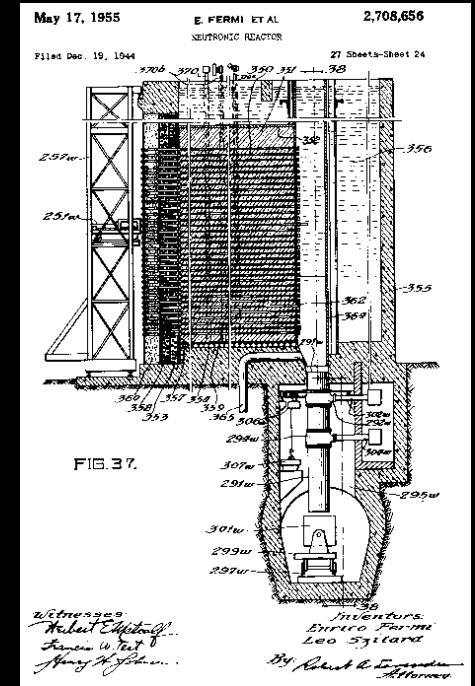
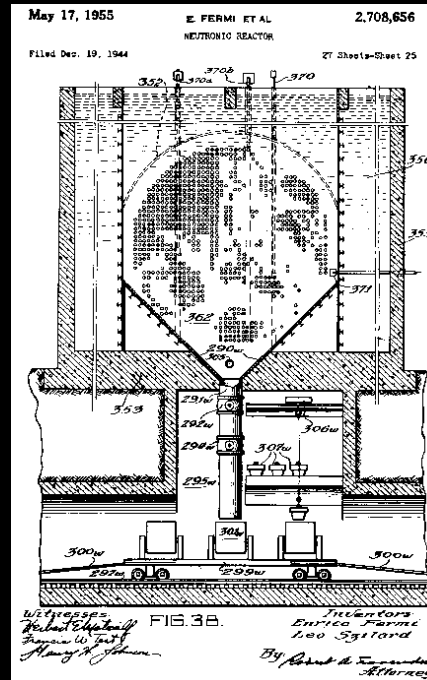
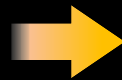
The Theories:

1. Fermi-Dirac Statistics \Rightarrow the Fermi level
2. Quantum Mechanics \Rightarrow the Fermi Golden Rule
3. $E = mc^2 \Rightarrow$ nuclear energy



The Experiment:

The neutronic reactor
(1st in the world)
drawn by Fermi



Shuji Nakamura (中村修二)

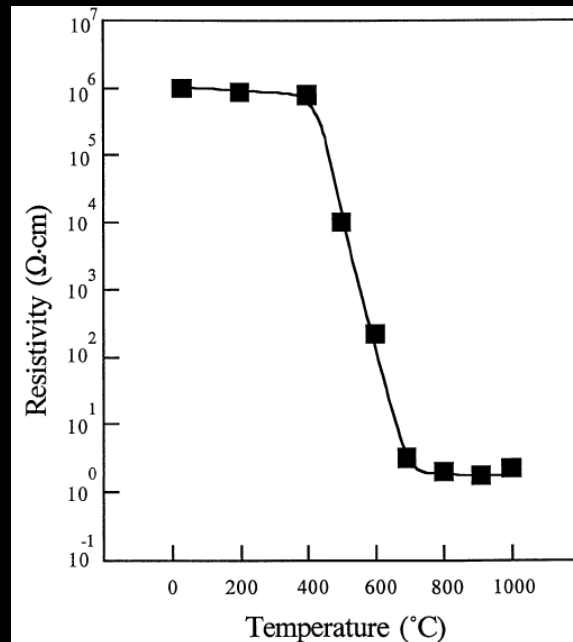
University of Tokushima
(徳島大學, QS全球排名: NA)

The Experiment:

1. Thermal annealing in $N_2 \rightarrow$ p-type GaN (1992)
2. Blue LED (1993)



3. Blue Laser (1999)



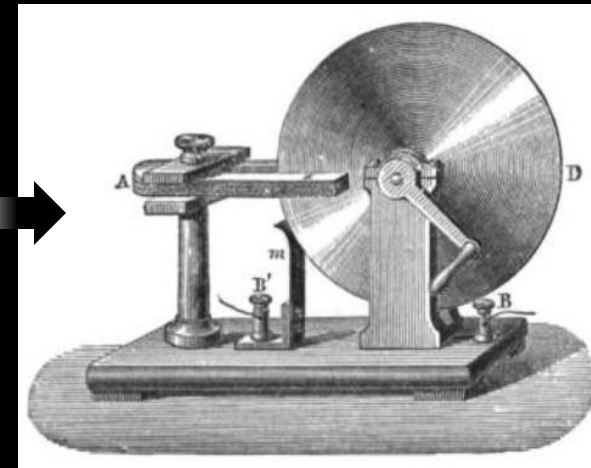
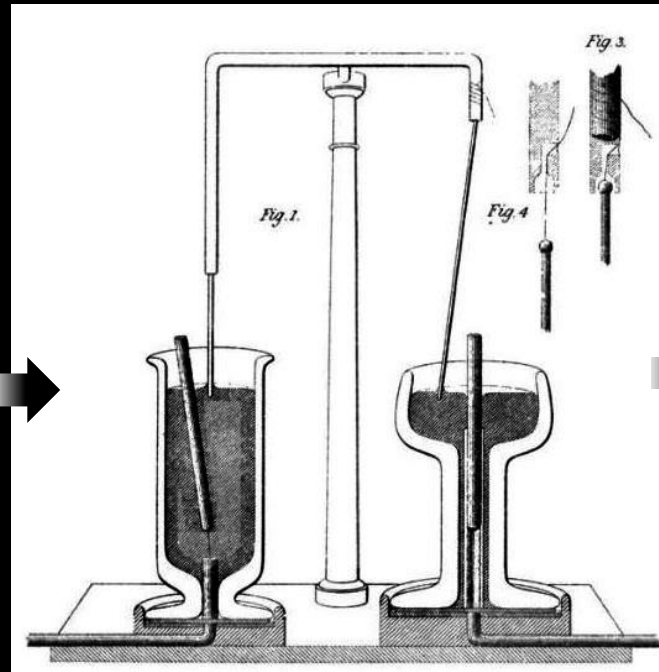
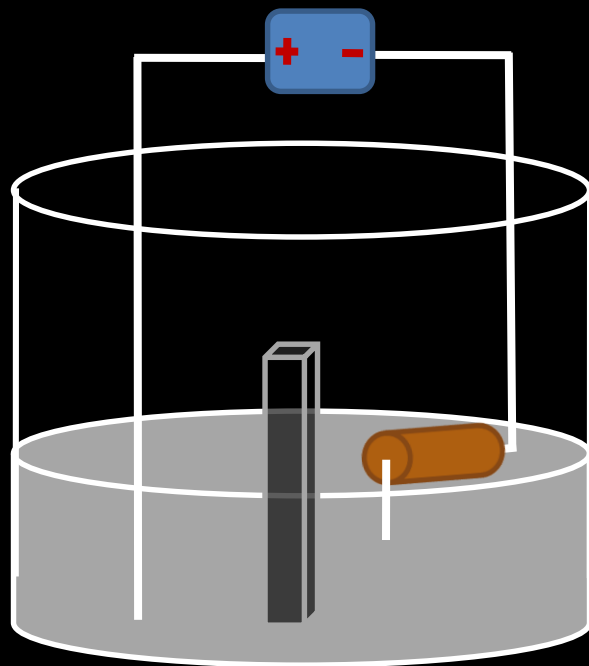
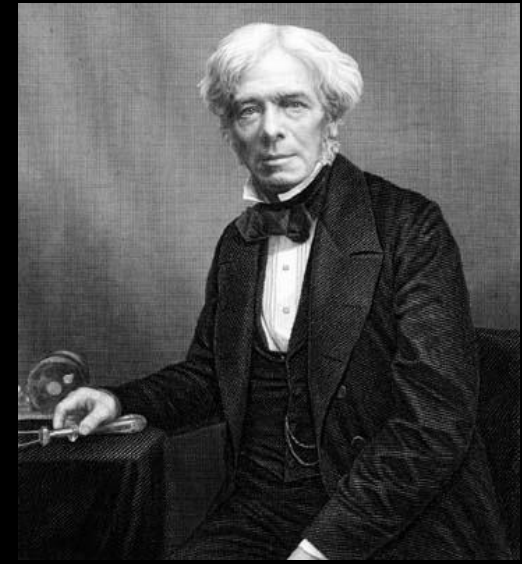
*Jpn. J. Appl. Phys. 31, L139 (1992),

2020 impact factor: 1.471, 101/148 in Physics, Applied

Michael Faraday

Some Elementary School in London...

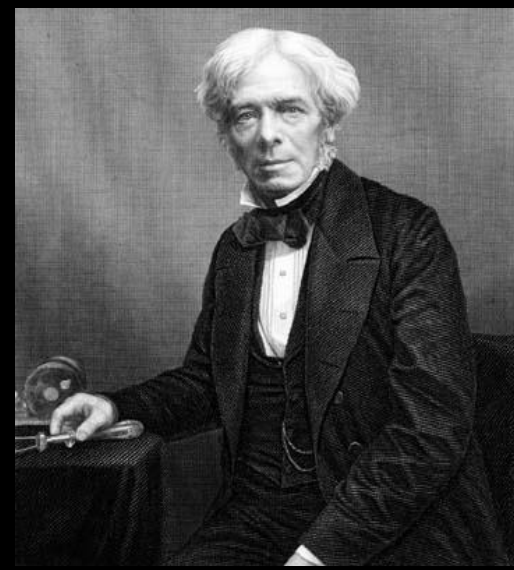
The Famous Experiment in 1821:



Michael Faraday

The carrier of:

1. Ohm
2. Kelvin
3. Joule
4. Maxwell



親愛的先生：

我已收到你寄來的文章，並且立刻就讀，感謝你對我們衷心所愛的科學，有這麼美好的貢獻，何等的榮耀，我能在一息尚存之際看到你為電學有這一步的跨出，我已看出你的未來會更輝煌！我知道在這領域裡仍有許多朦朧不清之處，你的文章卻如同黎明初曉，我不得不說，你在這自然科學的領域，提供了非常重要的貢獻。

你忠實的朋友，法拉第上

1843年三月24日於皇家學院

『當我讀到您在科學上的重要發現時，我深深地感到遺憾，
我過去的歲月實在浪費在太多無聊的事情上。』

聖赫勒拿島 拿破崙

So... What defines a good research ??

Not citation times, not impact factors, not even Nobel prize...



Charles M. Lieber
Harvard University

H-index: 140
Publications: 585
Citations: 98.7 K



What defines a good research ??

The one improving human lives...

“知識使人自高自大，唯有愛能造就人。”

歌林多前書 8:1

“ Knowledge puffs up, but love builds up. ”

1 Corinthians 8:1