

***EMERGENCE OF NEW
MARKETS:
CAN BUSINESS SURVIVE WITHOUT A
BETTER TECHNOLOGY ROADMAP?***

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and

Distinguished Professor
Chungbuk National University, Korea
ASQED, 10 July 2012
PENANG, MALAYSIA






강 력

표 준

급 속

조용조용

란제리/울 

절전살음

이 불

살 음

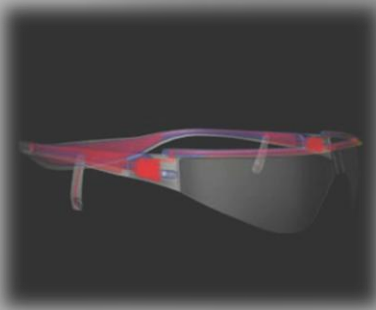
헹굼+탈수



전 원

동작/일시정지

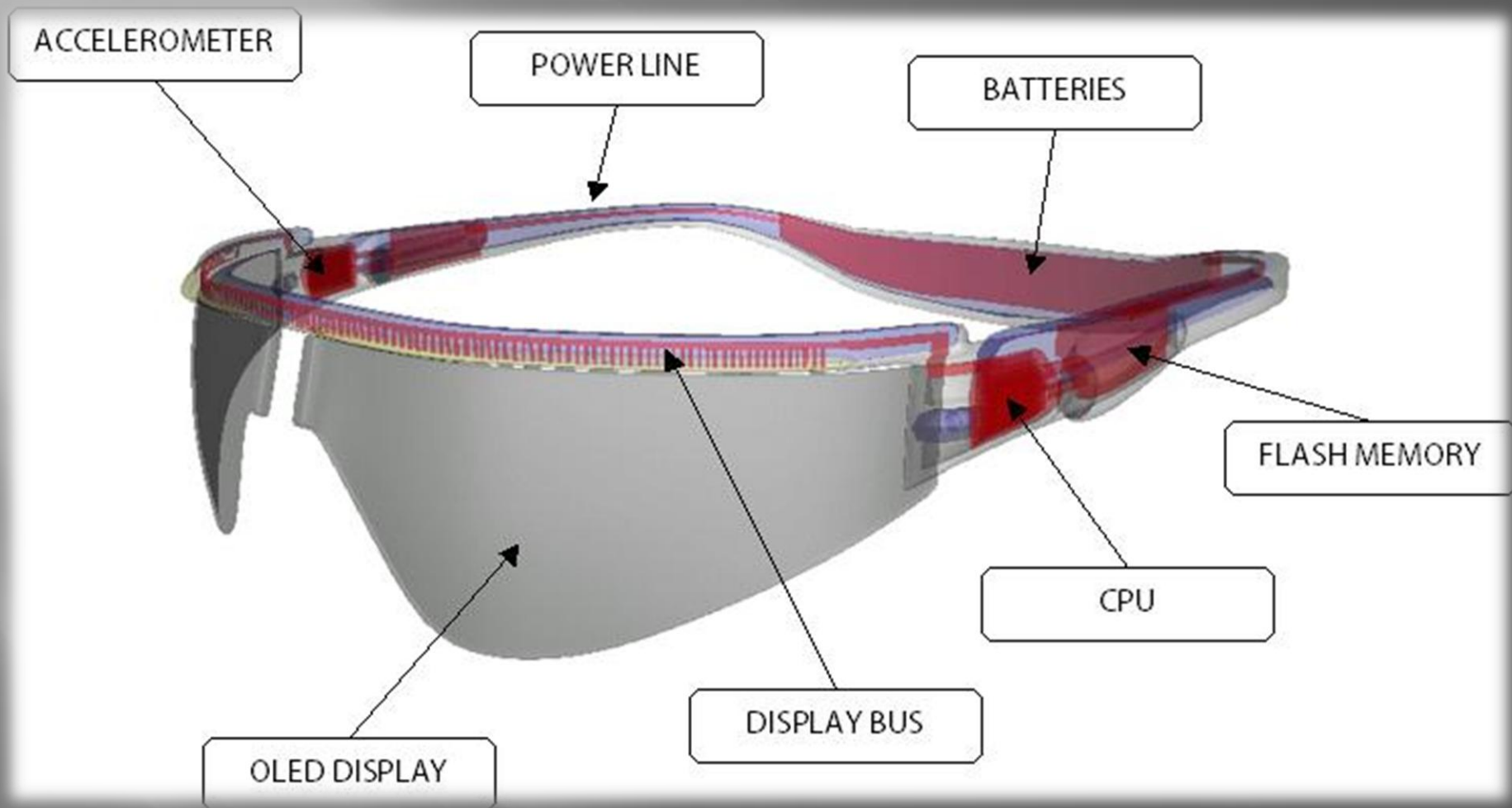




Smart Glasses



*I wish I could Read Korean!
Can there be a
technology roadmap to
match the 1.5kgm grey
matter – the brain?*



SMART CAR USES ARTIFICIAL INTELLIGENCE TO ENHANCE THE DRIVING EXPERIENCE



Medicine



W. L. Bragg
1915 Nobel prize
X-ray crystalogr.

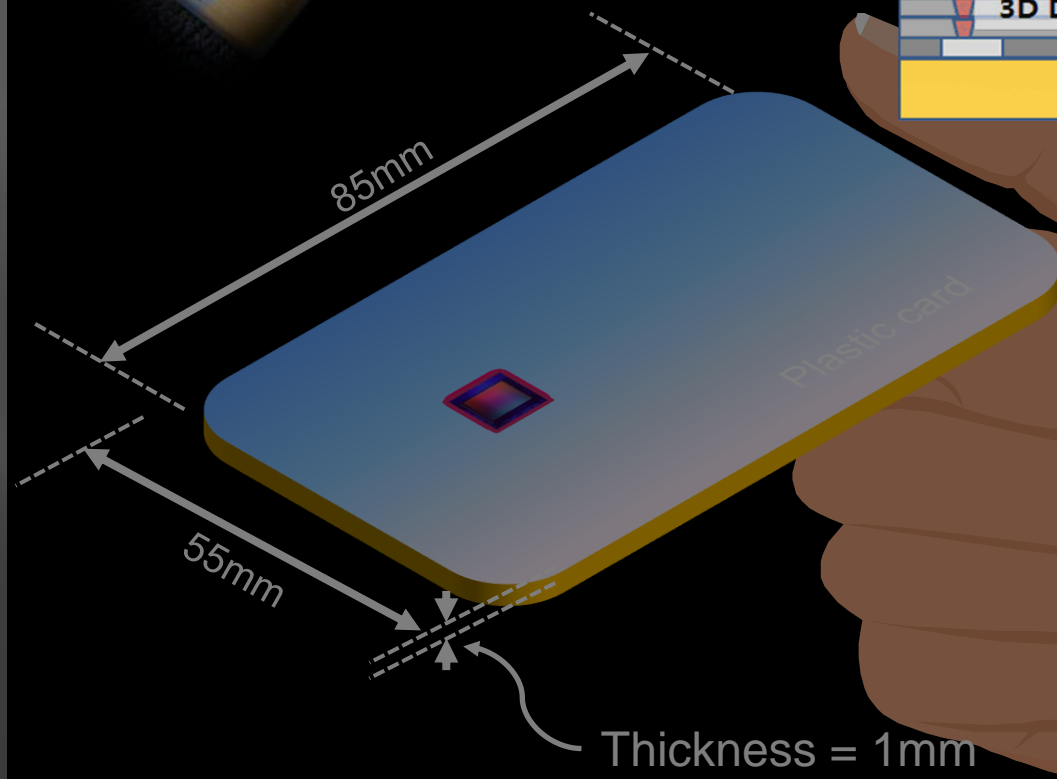
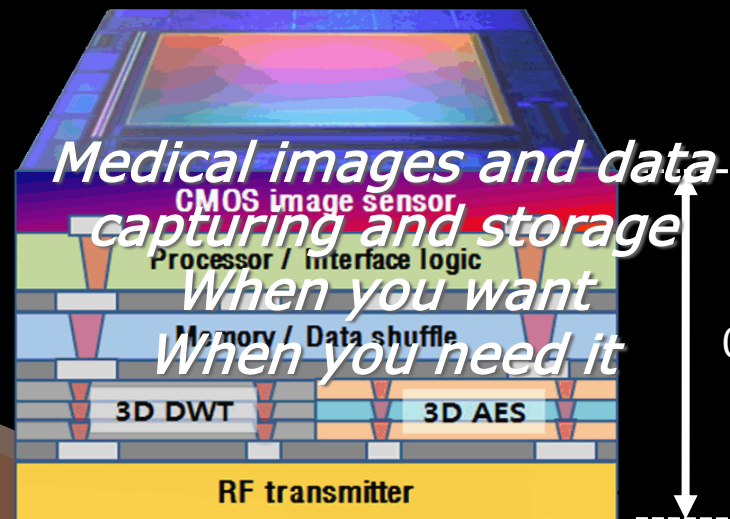
M. L. E.
Deut
Tric
Helic



R. A. Fisher
Fisher info.
Max. likelihood
F-K Equation



J. R. Warren
2005 Nobel prize
Ulcers





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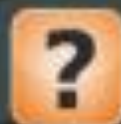
Home



Patient ID



Sync

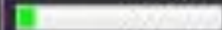


Help

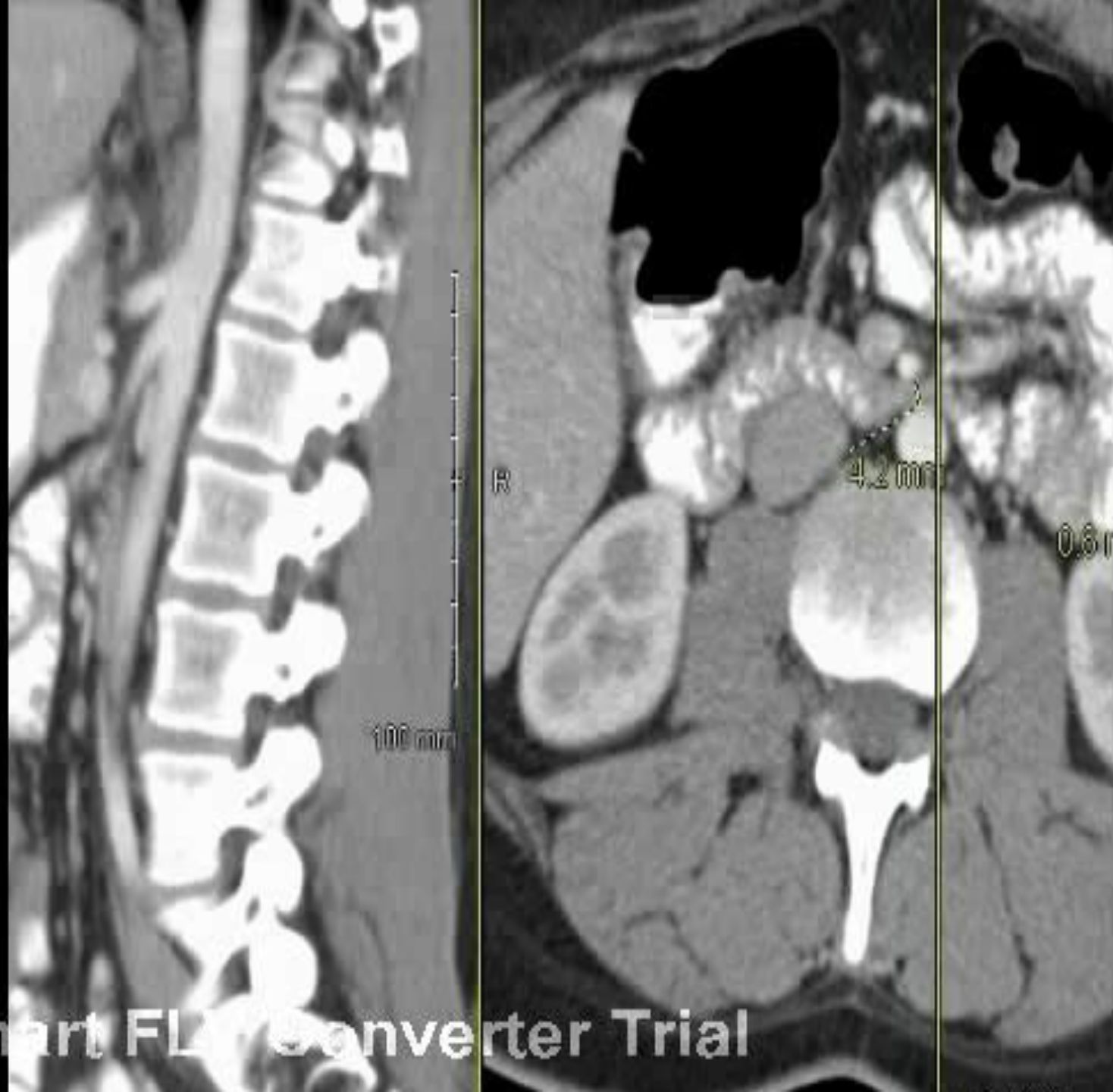


Exit

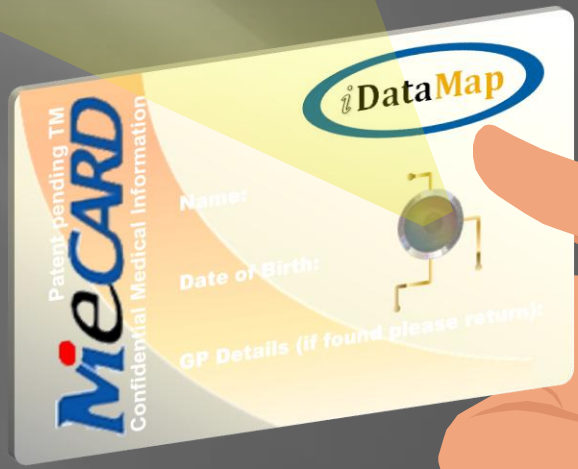
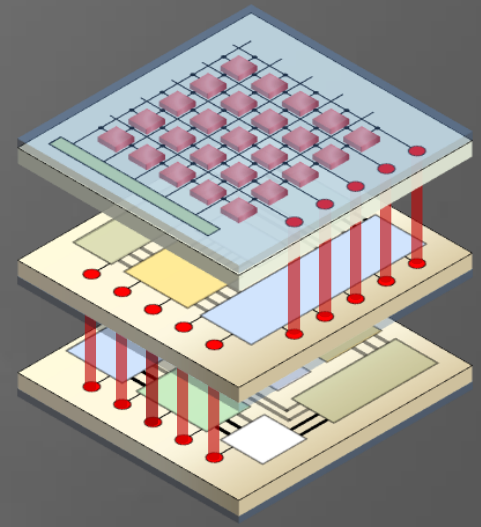
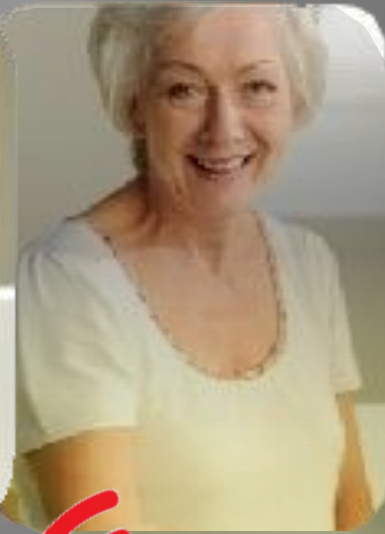
3.6G / 4G



8% used



Smart FLIC Converter Trial







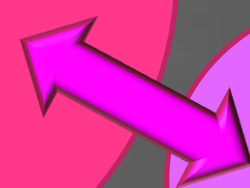
153 million base pairs

Genome Sequencing



- Short stature, idiopathic familial
- Leri-Weill dyschondrosteosis
- Langer mesomelic dysplasia
- Leukemia, acute myeloid, M2 type
- Chondrodysplasia punctata
- Kallmann syndrome
- Ocular albinism, Nettleship-Falls type
- Oral-facial-digital syndrome
- Nance-Horan cataract-dental syndrome
- Heterocellular hereditary persistence of fetal hemoglobin
- Pyruvate dehydrogenase deficiency
- Glycogen storage disease
- Coffin-Lowry syndrome
- Mental retardation
- Spondyloepiphyseal dysplasia tarda
- Paroxysmal nocturnal hemoglobinuria
- Infantile spasm syndrome
- Aicardi syndrome
- Deafness, sensorineural
- Simpson-Golabi-Behmel syndrome, type 2
- Adrenal hypoplasia, congenital
- Dosage-sensitive sex reversal
- Deafness, congenital sensorineural
- Retinitis pigmentosa
- Wilson-Turner syndrome
- Cone dystrophy
- Aland island eye disease (ocular albinism)
- Optic atrophy
- Night blindness, congenital stationary, type 1
- Erythroid-potentiating activity
- Arthrogryposis multiplex congenita
- Night blindness, congenital stationary, type 2
- Brunner syndrome
- Wiskott-Aldrich syndrome
- Thrombocytopenia
- Dent disease
- Nephrolithiasis, type I
- Hypophosphatemia, type III
- Proteinuria
- Anemia, sideroblastic/hypochromic
- Cerebellar ataxia
- Renal cell carcinoma, papillary
- Diabetes mellitus, insulin-dependent
- Sutherland-Haas syndrome
- Cognitive function, social
- Mental retardation, nonspecific
- Menkes disease
- Occipital horn syndrome
- Cutis laxa, neonatal
- FG syndrome
- Immunodeficiency, moderate and severe
- Miles-Carpenter syndrome
- Charcot-Marie-Tooth neuropathy, dominant
- Mental retardation
- X-inactivation center
- Premature ovarian failure
- Arts syndrome
- Cleft palate and/or ankyloglossia
- Megalocornea
- Epilepsy (Juberg-Hellman syndrome)
- Pelizaeus-Merzbacher disease
- Spastic paraplegia
- Alport syndrome
- Cowchock syndrome
- Hypertrichosis, congenital generalized
- Ptoxis, hereditary congenital
- Apoptosis inhibitor
- Panhypopituitarism
- Thoracoabdominal syndrome
- Simpson-Golabi-Behmel syndrome, type 1
- Split hand/foot malformation, type 2
- Hypoparathyroidism
- Mental retardation, Shashi type
- Lesch-Nyhan syndrome
- HPRT-related gout
- Lowe syndrome
- Borjeson-Forsman-Lehmann syndrome
- Testicular germ cell tumor
- Hemophilia B
- Warfarin sensitivity
- Osseous dysplasia (male lethal), digital
- Adrenoleukodystrophy
- Colorblindness, blue monochromatic
- Cardiac valvular dysplasia
- Emery-Dreifuss muscular dystrophy
- Heterotopia, periventricular
- Favism
- Hemolytic anemia
- Colorblindness, green cone pigment
- Incontinentia pigmenti, type II
- Hydrocephalus
- MASA syndrome
- Spastic paraplegia
- Rett syndrome
- Mature T-cell proliferation
- Myopia (Bornholm eye disease)
- Mental retardation with psychosis
- Endocardial fibroelastosis

- Hodgkin disease susceptibility, pseudoautosomal
- Ichthyosis
- Microphthalmia, dermal aplasia, and sclerocornea
- Episodic muscle weakness
- Mental retardation
- Ocular albinism and sensorineural deafness
- Amelogenesis imperfecta
- Charcot-Marie-Tooth disease, recessive
- Keratitis follicularis spinulosa decalvans
- Hypophosphatemia, hereditary
- Partington syndrome
- Retinoschisis
- Gonadal dysgenesis, XY female type
- Mental retardation, non-dysmorphic
- Agammaglobulinemia, type 2
- Craniofrontonasal dysplasia
- Opitz G syndrome, type I
- Pigment disorder, reticulate
- Melanoma
- Duchenne muscular dystrophy
- Becker muscular dystrophy
- Cardiomyopathy, dilated
- Chronic granulomatous disease
- Snyder-Robinson mental
- Norrie disease
- Exudative vitreoretinopathy
- Coats disease
- Renpenning syndrome
- Retinitis pigmentosa
- Mental retardation
- Dyserythropoietic
- Chondrodysplasia
- Autoimmunity-I
- Renal cell carcinoma
- Faciogenital dys
- Chorioathetosis
- Sarcoma, synovial
- Prieto syndrome, dilated
- Spinal muscular
- Migraine, familial
- Androgen insens
- Spinal and bulb
- Prostate cancer
- Perineal hyposp
- Breast cancer, i
- Ectodermal dys
- Alpha-thalasse
- Juberg-Marsidi s
- Sutherland-Haas
- Smith-Fineman-M
- Hemolytic anemia
- Myoglobinuria/hem
- Wieacker-Wolff syn
- Torsion dystonia-park
- Leukemia, myeloid/lym
- Anemia, sideroblastic, v
- Allan-Herndon syndrome
- Deafness
- Choroideremia
- Agammaglobulinemia
- Fabry disease
- Mohr-Tranebjaerg syndrom
- Jensen syndrome
- Lissencephaly
- Bazex syndrome
- Mental retardation with growth hormone deficiency
- Mental retardation, South African type
- Lymphoproliferative syndrome
- X-inactivation, familial skewed
- Pettigrew syndrome
- Gustavson mental retardation syndrome
- Immunodeficiency, with hyper-IgM
- Retinitis pigmentosa
- Wood neuroimmunologic syndrome
- Heterotaxy, visceral
- Albinism-deafness syndrome
- Cone dystrophy, progressive
- Prostate cancer susceptibility
- Fragile X mental retardation
- Epidermolysis bullosa, macular type
- Diabetes insipidus, nephrogenic
- Cancer/testis as
- Dyskeratosis
- Hemophilia A
- Hunter syndrome
- Mucopolysaccharidosis
- Intestinal pseudoobstruction, neuronal
- Melanoma antigens
- Mental retardation-skeletal dysplasia
- Myotubular myopathy
- Otopalatodigital syndrome, type I
- Colorblindness, red cone pigment
- Goeminne TKCR syndrome
- Waitsman parkinsonism-mental retardation
- Barth syndrome
- Cardiomyopathy, dilated
- Noncompaction of left ventricular myocardium
- Von Hippel-Lindau binding protein



Provide information on all 6B bases in the human genome



Appear when illuminated



2 p.m.



10 a.m.

BRAIN WAVES



Relaxed ears are Down

Concentrating ears are Up

Amused one ear wiggles



Perth - Western Australia



Computational Capacity

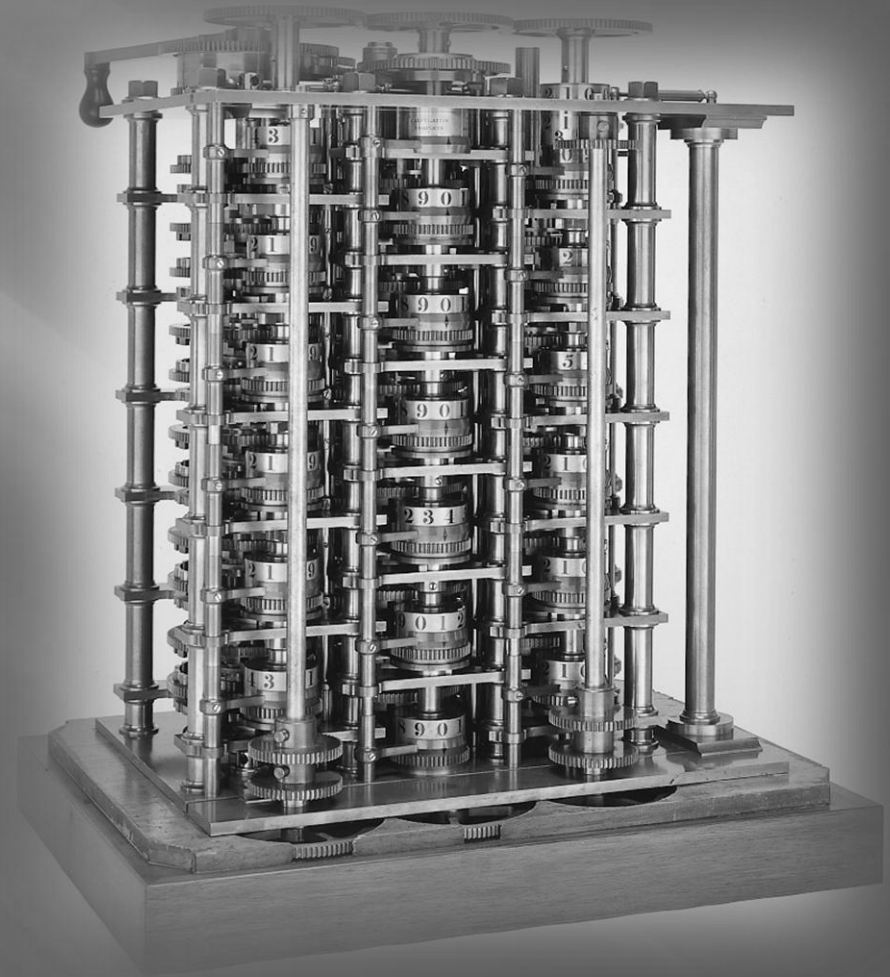


City of Light
Baha'i Gardens
Haifa



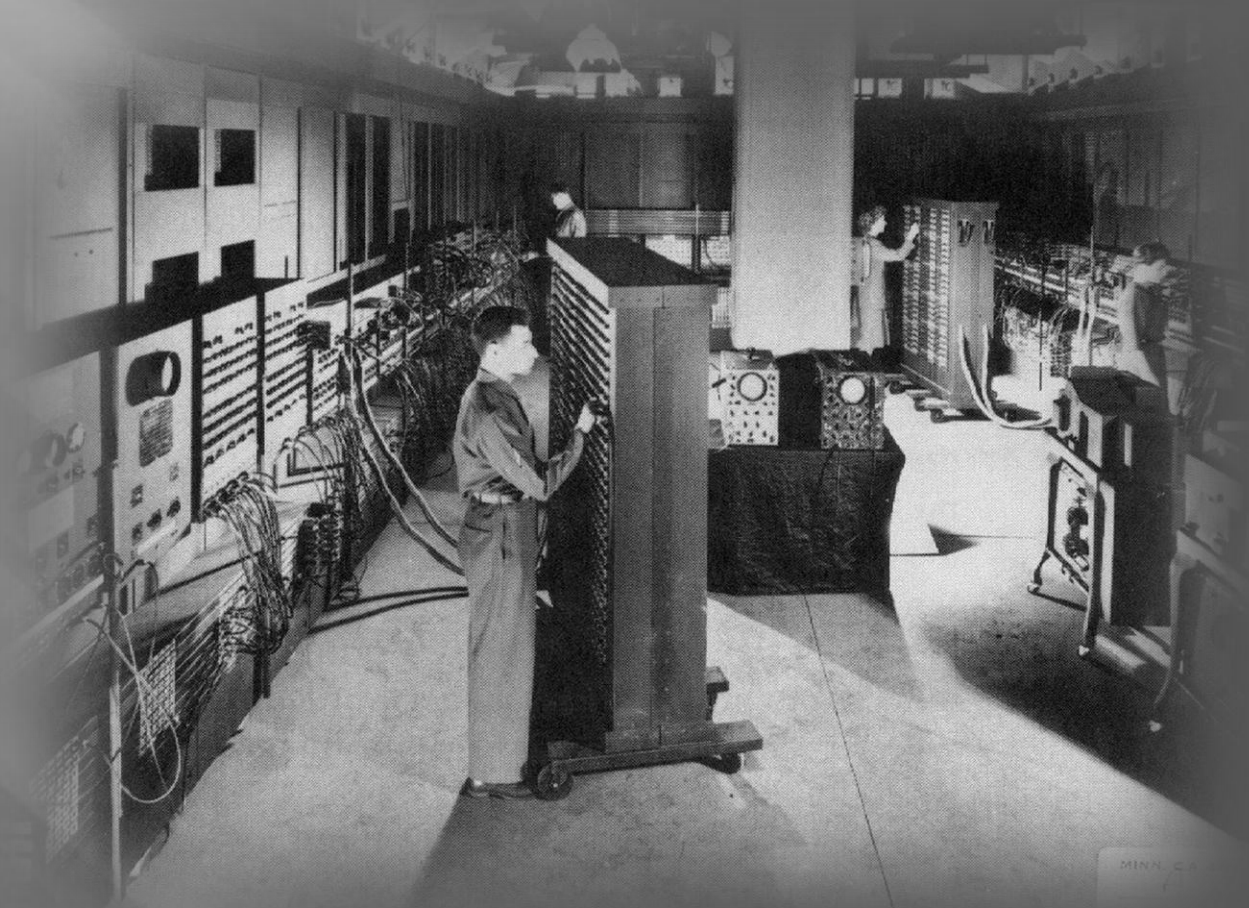
The Babbage Difference Engine

- 1832
- 25,000 parts
- cost: £17,470

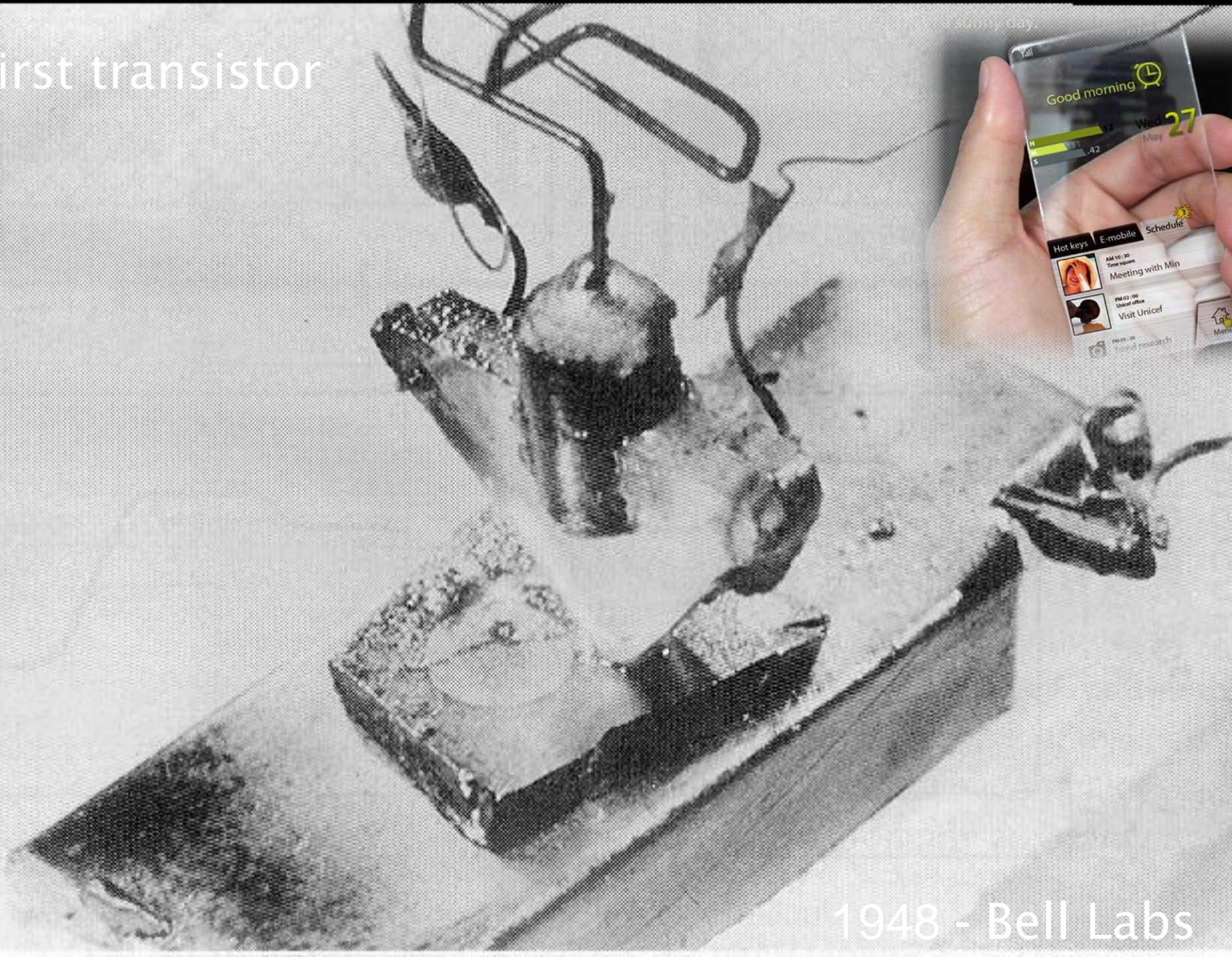


ENIAC

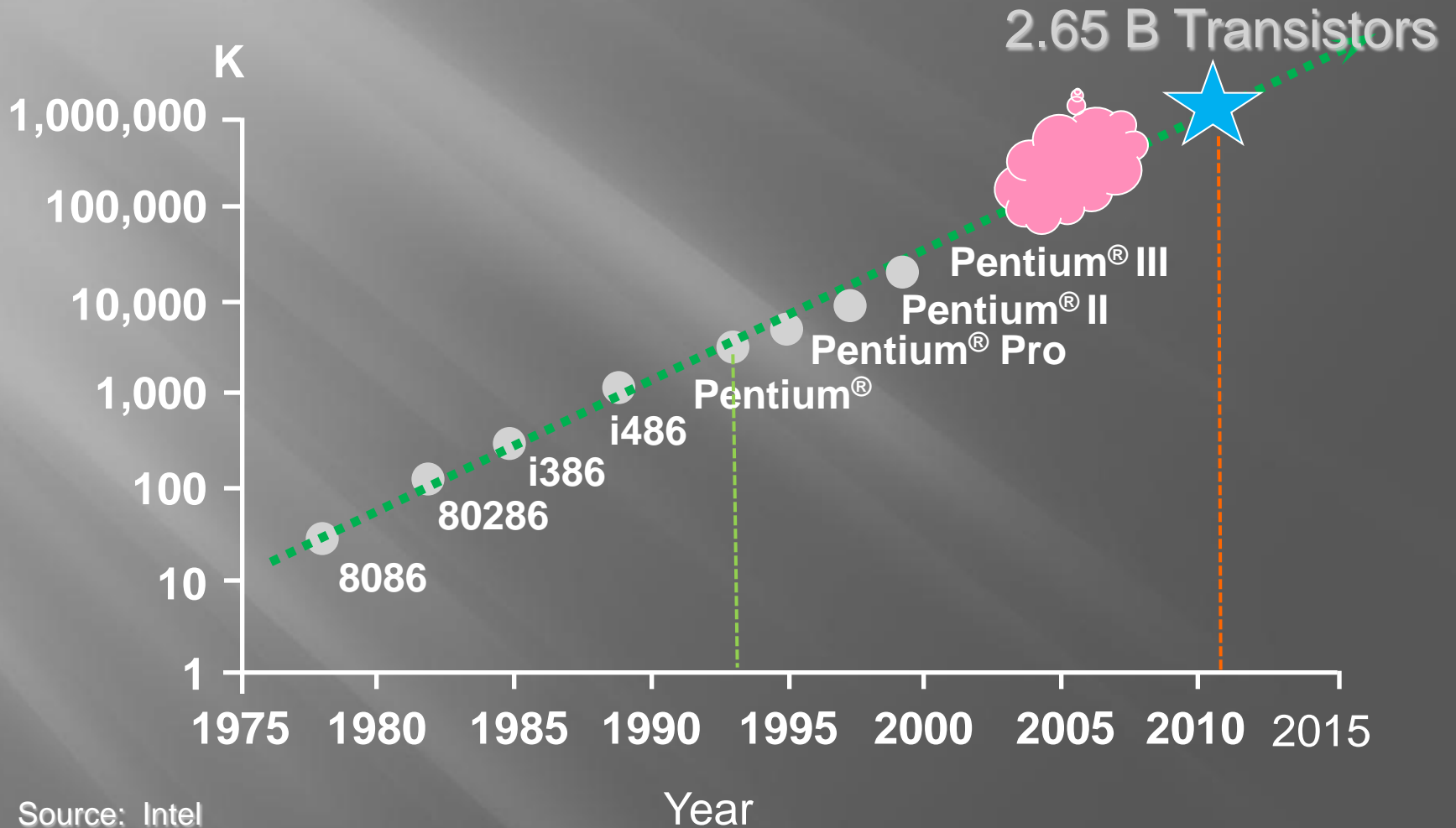
1946: The first electronic computer



First transistor

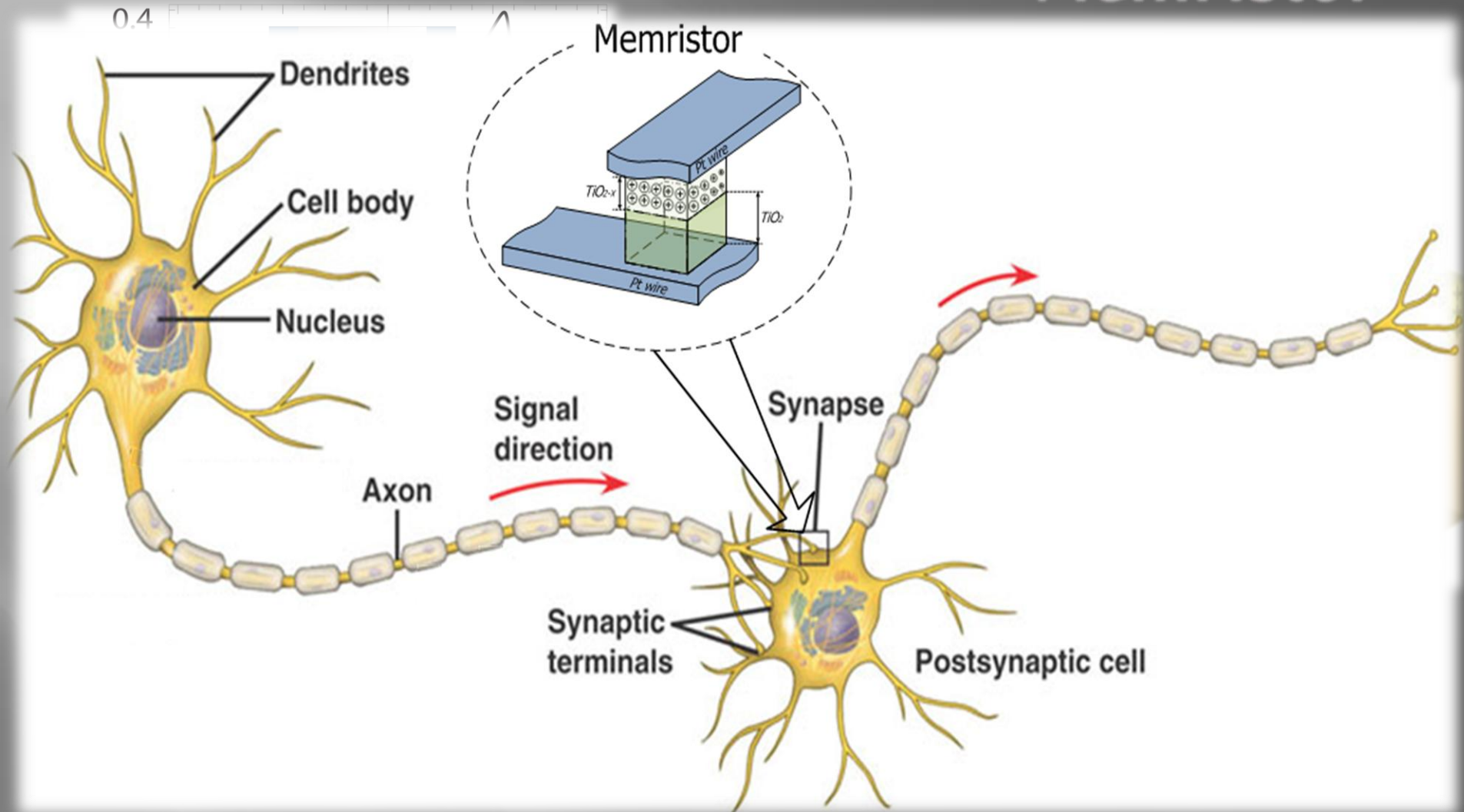


1948 - Bell Labs



Source: Intel

4th Fundamental Circuit Element: Memristor



- ▶ **No. neurons** **10^{11}**
- ▶ **No. synapses** **10^{14}**
- ▶ **No. input neurons** **10%**
- ▶ **No. output neurons** **90%**
- ▶ **Storage capacity** **10^{13} - 10^{15} b**
- ▶ **Utilisation factor** **10%**
- ▶ **Firing frequency** **50-100 Hz**
- ▶ **Signal propagation speed** **5-125 m/s**
- ▶ **Average brain weight** **1.5 kg**
- ▶ **Dissipation** **10 Watts**

Travelling Through 300 years

- ▣ Investors are telling business, government leaders and academia:
 - in a globalized, fast paced world value is based upon:
 - ▣ what you know, and
 - ▣ when you know it

INFORMATION

Agricultural-based Economy

- ▣ 300 years back the world's wealthiest people owned land.
- ▣ In an agricultural-based economy, most human resources were deployed in food and shelter production.
- ▣ Globally, owning land was the most valuable thing.

Industrial Revolution

- ▣ 120 years ago - **Industrial Revolution.**
- ▣ Productivity rose
 - applying new machines to jobs carried out by workforce.
 - age of manufacturing was based on productivity of machines and the application of industrial processes to what formerly was hand labor
- ▣ Some industrialists captured this value of greater productivity.
- ▣ Henry Ford and the like became wealthiest of the wealthy.



Henry Ford
(ca. 1919)

(Photo credit: Wikipedia)

Engines Automobiles Airplanes

Catalyst

- ▣ 1950s - America's farmers were forced to create much larger farms to remain in business,
 - subsidies to stay alive via
 - price controls
- ▣ 1980s family farms going bankrupt,
 - agricultural land values dived
 - ability to create value by growing or processing food became very difficult.

Movement of Wealth

- ▣ As part of survival in agriculture
 - Needed machinery more than land,
 - Vast tracts could be farmed with few people,
 - ▣ but with enormously expensive equipment.
 - Industrial products **DETERMINED VALUE**, and not the land.
- ▣ **Movement of wealth from hands of landowners into hands of industrial companies**

Information Economy

- ▣ 1990s - massive movement towards Information Economy
- ▣ Companies able to drive new levels of productivity
 - ▣ creation,
 - ▣ management,
 - ▣ use and sale of information to create significant value.
- ▣ Companies with little technology – cannot create value.

Integration of Technologies: New Platform

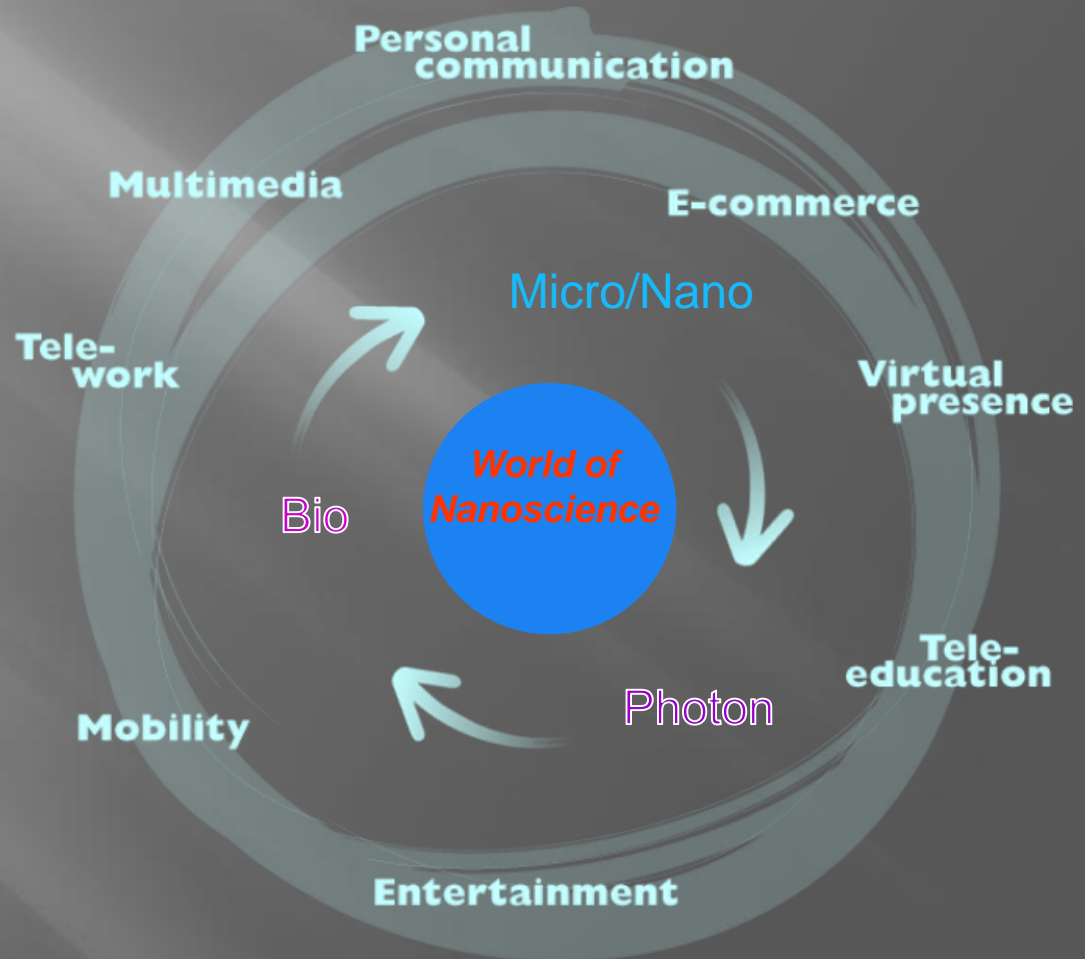
- Technology Pillars:
 - Nano/Micro
 - Bio
 - Photon



- New Research
- New Applications
- New Opportunities



The **Benefactors** ????

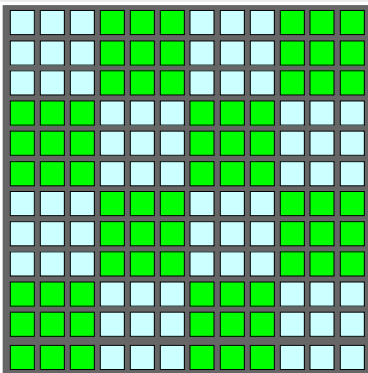


eMirror

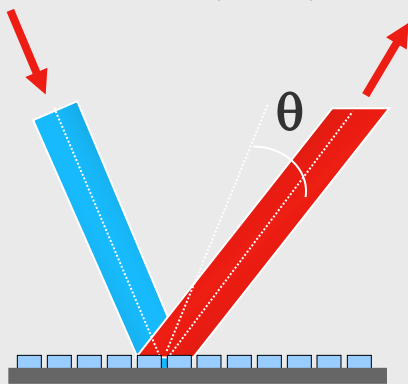
Memristor - multilevel storage that would allow realization of multi-phase pixels.

Steering Hologram

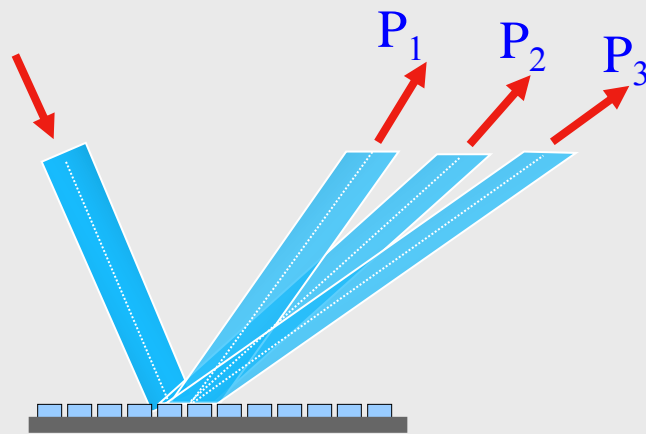
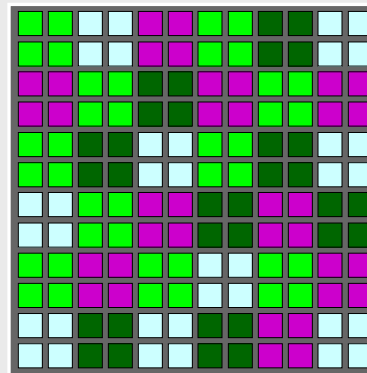
← M·d →



$$\theta = \lambda / (M \cdot d)$$

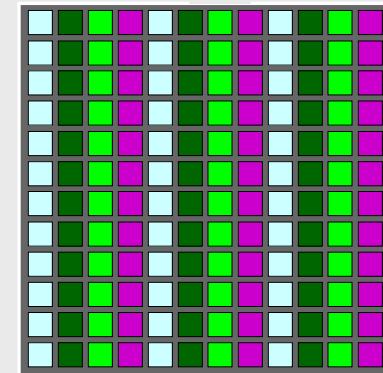


Multicasting Hologram

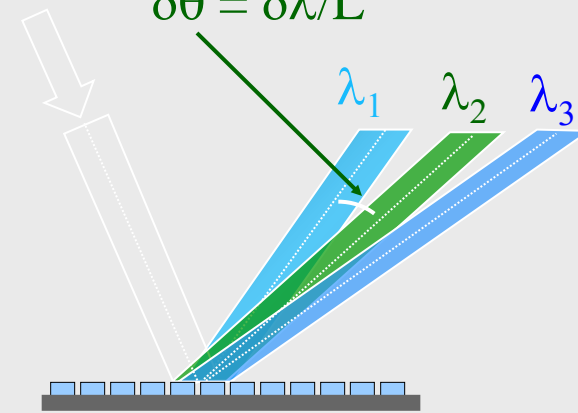


DEMUX Hologram

← L →



$$\delta\theta = \delta\lambda / L$$

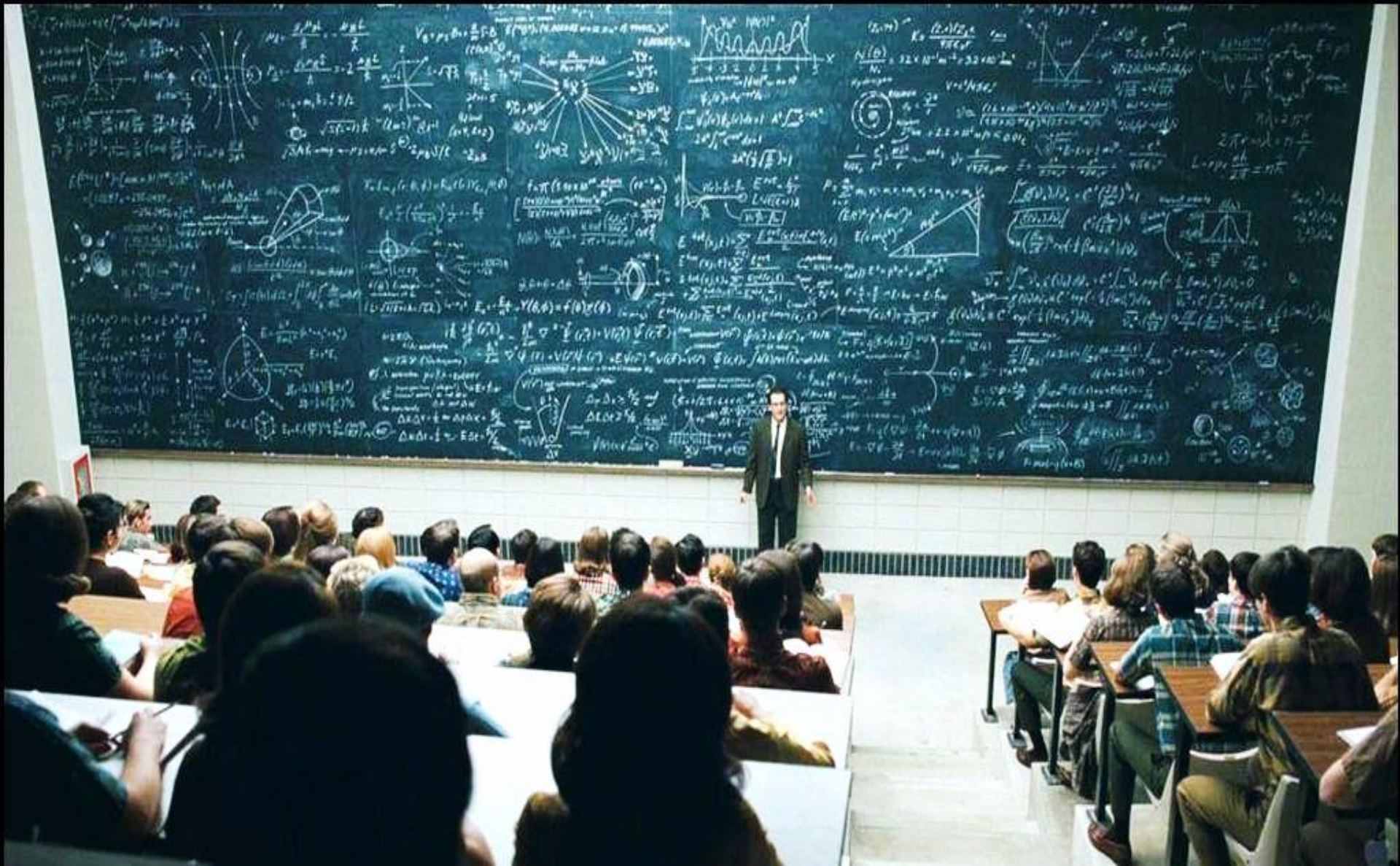


Future : 10 Inventions Needed

- ▣ **Free Energy**
- ▣ **Transporter** - *uncertainty principle of quantum mechanics*
- *work in Tokyo and sleep in Paris*
- ▣ **Replicator Technology**
- ▣ **Universal Communicator**
- ▣ **The Cure** - *holy Grails of medical research*
- *regenerating brain cells*
- ▣ **Fountain of Youth** - *without surgery?*
- *Ladies choice*
- ▣ **Protective Force Field**
- ▣ **Flying Cars** - *Highway in the Sky*
- ▣ **The Battery Operated Butler** - *iRobots*
- ▣ **The Time Machine** - *Time Travelers*

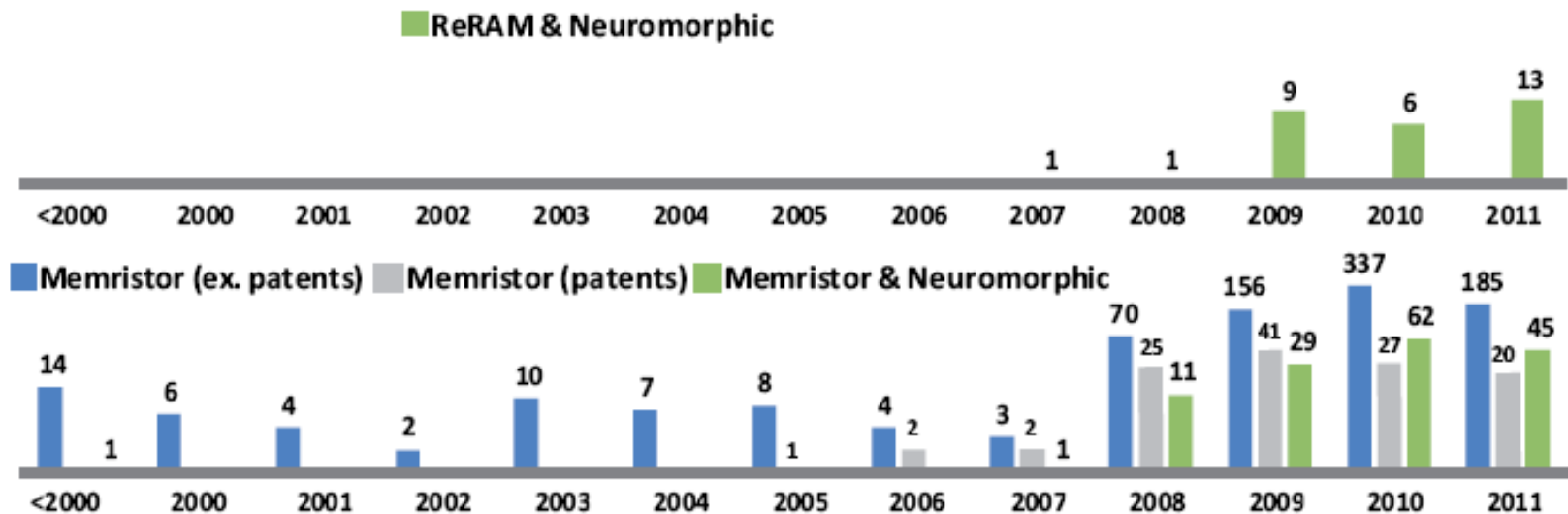


Understanding the Mathematics of: Business, Education and Government



4th Fundamental circuit Element

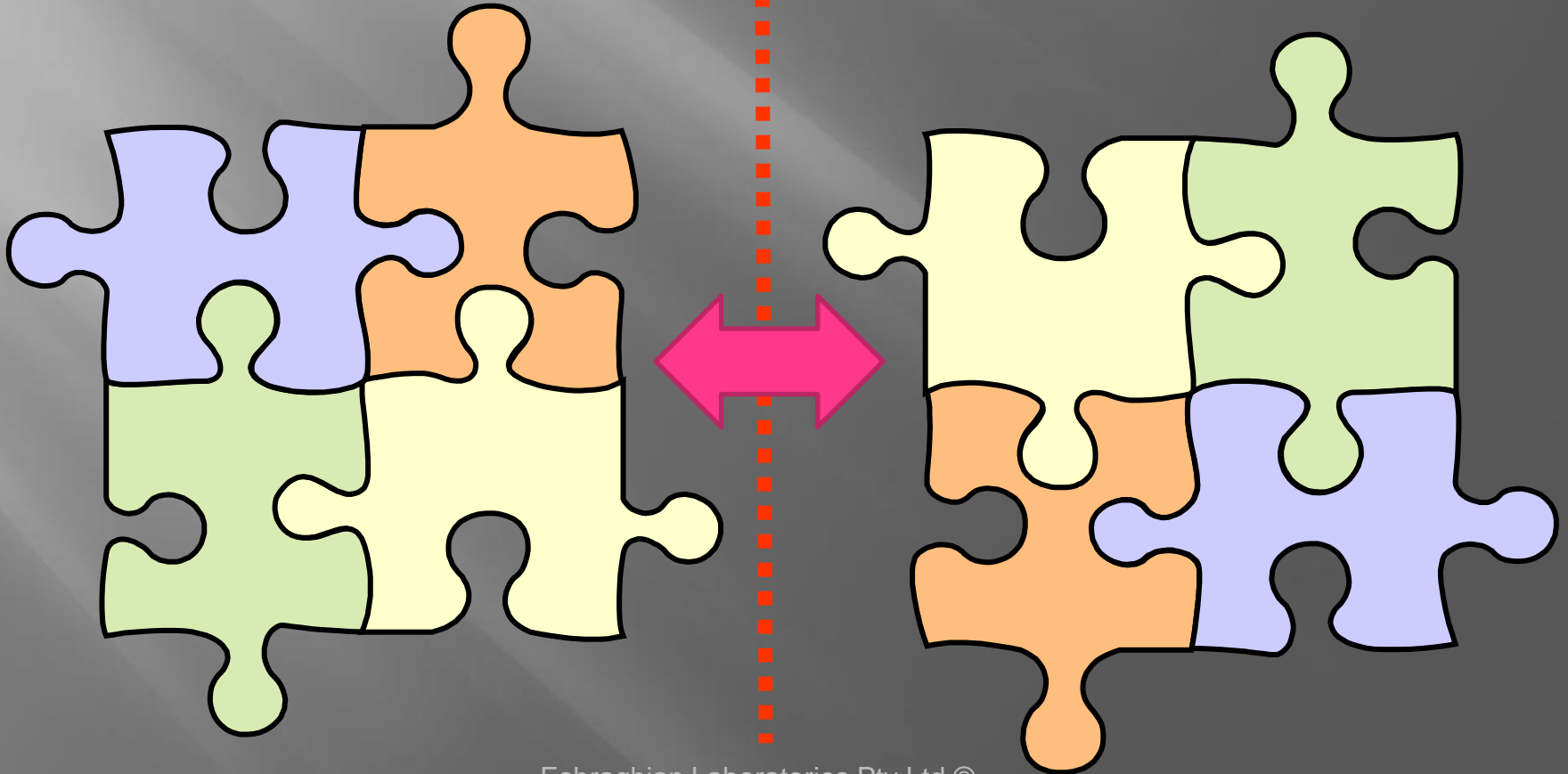
- Patents (Total number of patents are extracted from Blaise Mouttet's blog):
 - Memory (nonvolatile): 1322
 - Logic and computing: 23
 - Neuromorphic: 3



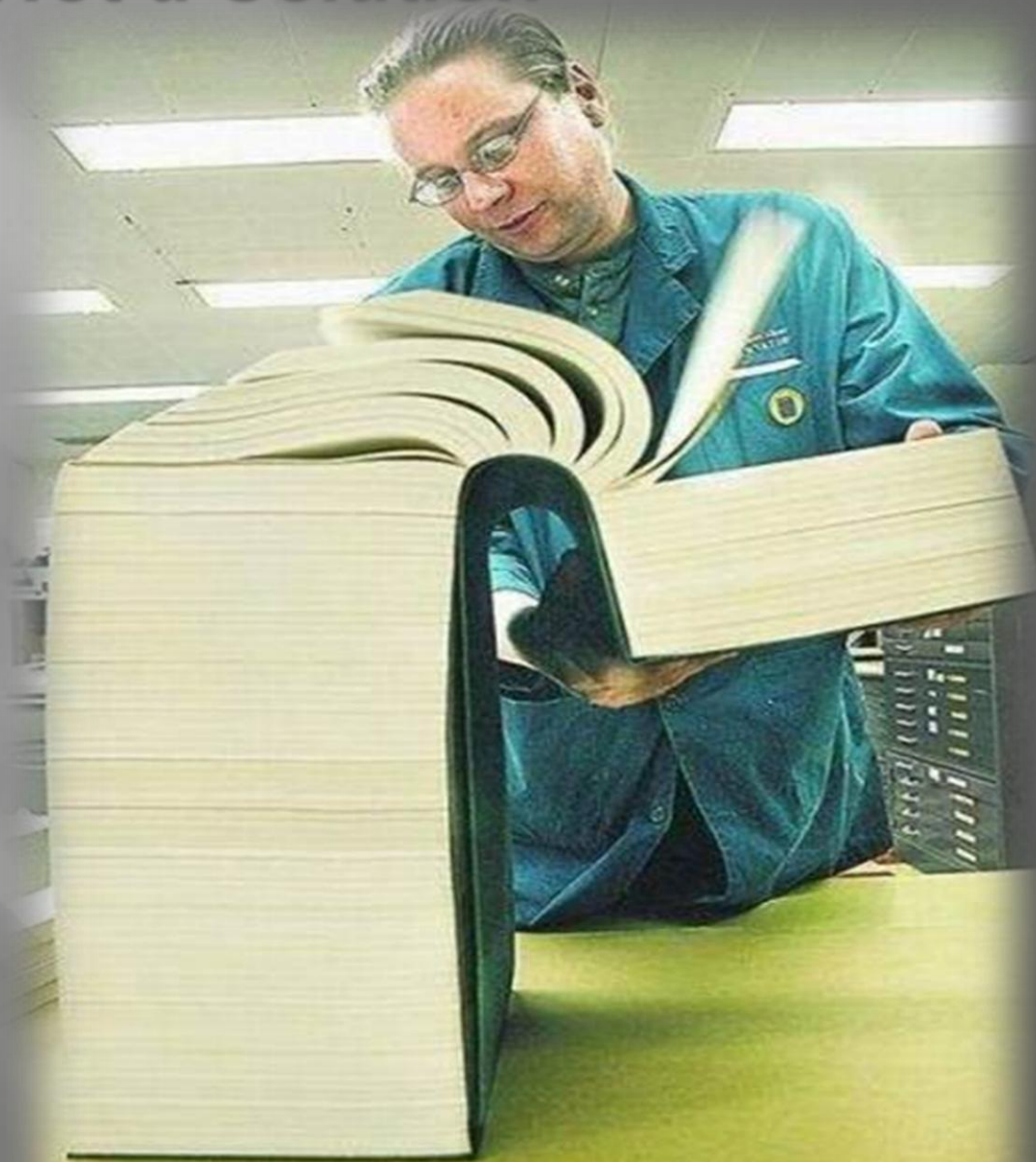
Connectivity Through Education

Intellectual Energy

Government Agencies



This is Not a Solution





Apple's Value Poised To Top Combined Capitalization Of Spain, Portugal, Greece

Source: [Business Insider.com](http://BusinessInsider.com)

