UNIVERSITÀ DEGLI STUDI DI PADOVA

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Noto, 6 September 2023

Microelectronics and geopolitics: the scientific and technological perspective

Alessandro Paccagnella

Department of Information Engineering,

University of Padua

Alessandro.paccagnella@unipd.it

Reliability and Radiation Effects on Advanced CMOS Technologies

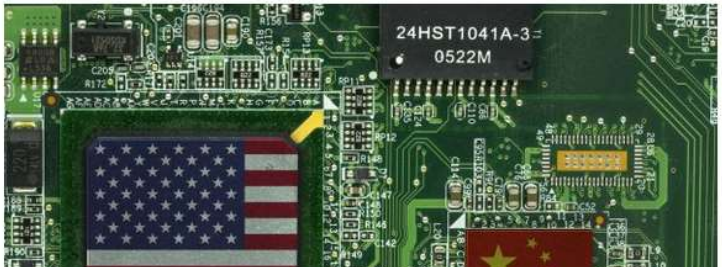
The chips war

THE DIPLOMAT
READ THE DIPLOMAT, KNOW THE ASIA-PACIFIC

FLASHPOINTS | ECONOMY | EAST ASIA

The Future of the China-US Chip War

Beijing sees no choice but to have the state take control of its tech industry amid U.S. pressure. But past experience shows that the big semiconductor push will bring complications.



By Zhuoran Li
March 02, 2023

ALJAZEERA News Ukraine war Features Economy Opinion Vide

OPINION
Opinions | Business and Economy

Why Biden's chip war on China is straining US alliances

A battle over chips with China is testing the robust unity the US and its allies have shown on Ukraine.

Ahmadi Ali
Scholar of sanctions and economic statecraft

20 Jan 2023

CNN BUSINESS Markets Tech Media Success Perspectives Videos

Europe joins the US in its chip war with China

By Juliana Liu and Wayne Chang, CNN
Published 7:11 AM EST, Thu March 9, 2023

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In the Tech War with China, the U.S. Is Finding Friends

FINANCIAL TIMES

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US-China relations + Add to myFT

China bans Micron's products from key infrastructure over security risk

Crisi dei chip e auto, come stanno le cose e il ruolo della Cina

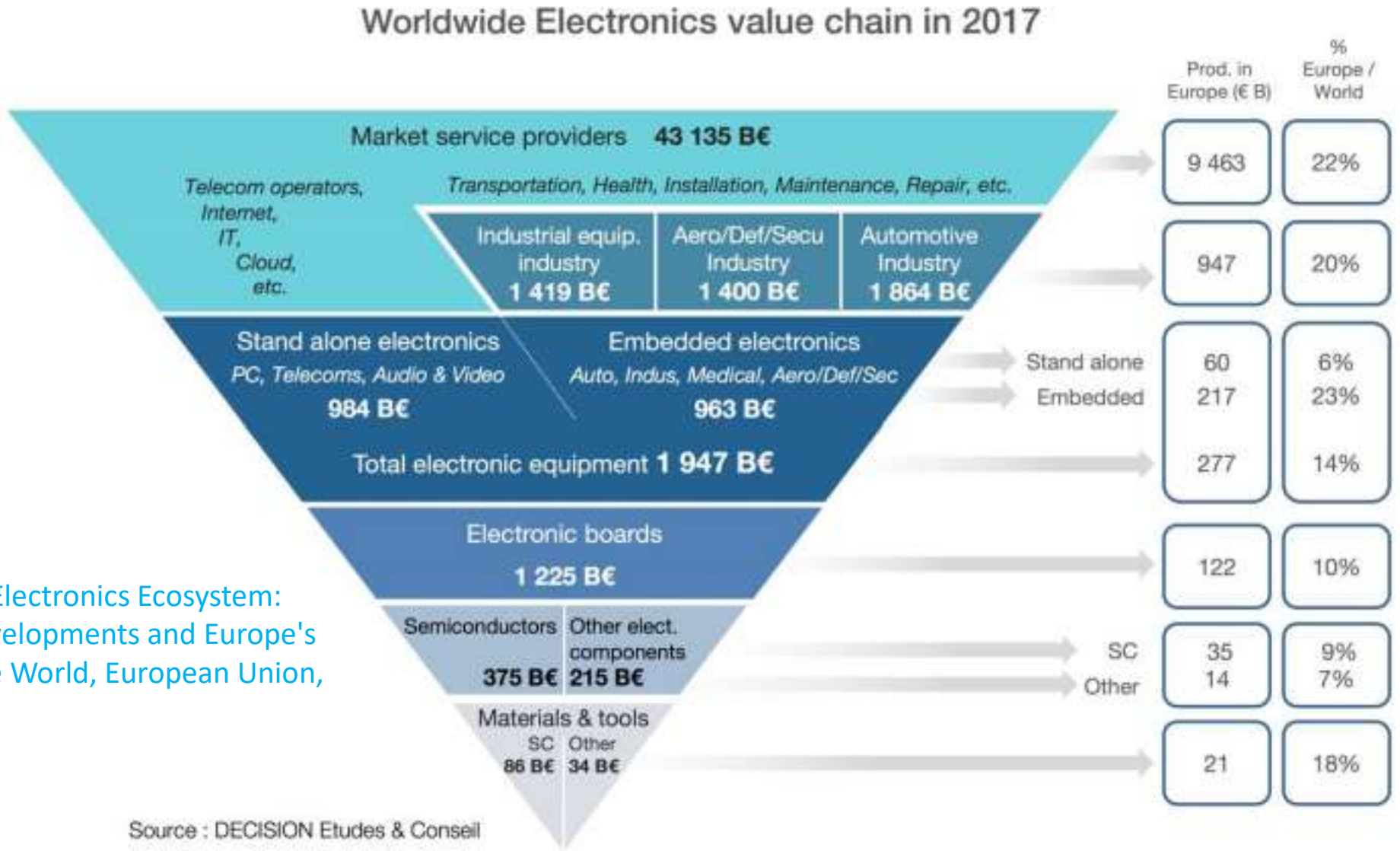
Altro che calo della produzione: nel 2021 il numero di pezzi consegnati ai clienti è aumentato del 15%. Quello che è interessante capire è a chi siano andati i semiconduttori

Gianluigi Giannetti

08 marzo 2022 - 12:23

La Gazzetta dello Sport
Tutto il rosa della vita

Electronics value chain



Study on the Electronics Ecosystem: Overview, Developments and Europe's Position in the World, European Union, 2020

EU

Thierry Breton (since 2019 Commissioner for Internal Market of the European Union), **15 September, 2021**:

How a European Chips Act will put Europe back in the tech race

"**The world is short of semiconductors**.

The shortage of semiconductors – also known as chips – has very concrete consequences on the EU economy, jobs and even leisure. Carmakers postpone the production of vehicles. Broadband providers run out of Internet routers. Gamers cannot get their hands on next-gen consoles.

The situation might last for a while.

Semiconductors are at the core of our world's digitisation, but global supply is currently struggling to meet the explosion of demand driven by smartphones, Internet of Things and connected cars. But it is not only about supply and demand.

Semiconductors are at the core of the global technological race

Semiconductors are at the centre of strong geostrategic interests, and at the core of the global technological race.

Superpowers are keen to secure their supply in the most advanced chips as they are well aware that it will condition their capacity to act (militarily, economically, industrially) and drive digital transformation."

Chips are used:

→ in everyday life
(work, education, entertainment, households)

→ for critical applications
(cars, planes, healthcare)

→ for key infrastructures
(energy, mobility, data and communication)

And are essential for tomorrow's economy
(green energy, Internet of Things, artificial intelligence, high-performance computing platforms)

Chips are essential for a wide range of technological and digital products, such as cars, household appliances and electronics. Due to geostrategic issues and supply chain disruptions, European industry is currently facing challenges in the supply of semiconductors.

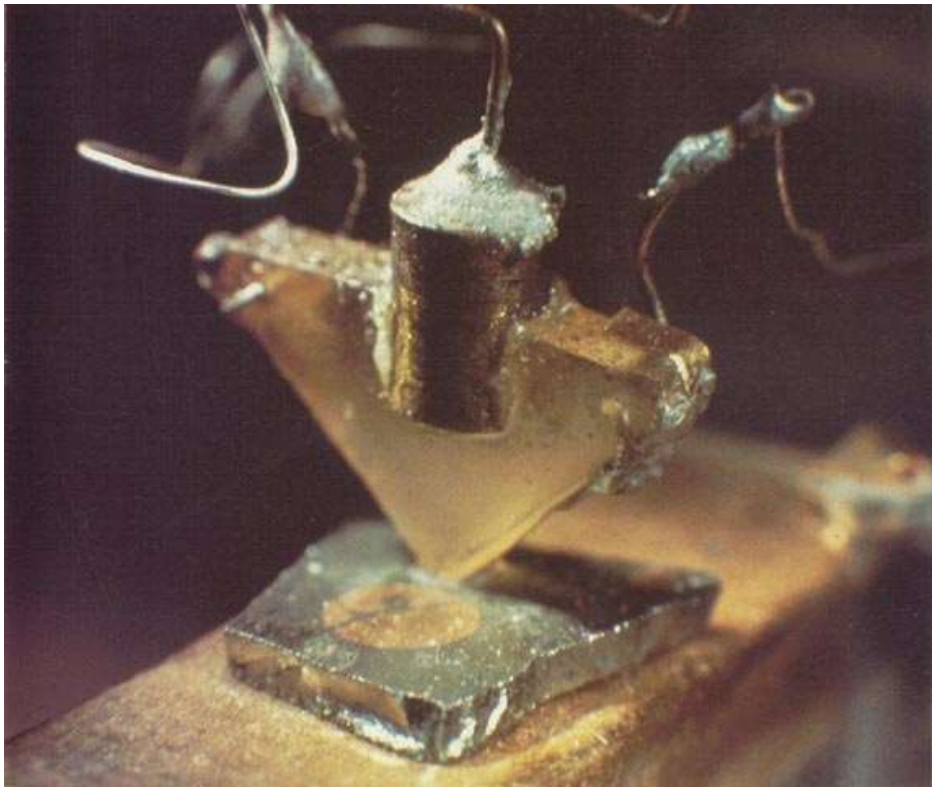
The Chips Act aims to **reduce the EU's vulnerabilities and dependencies** on foreign actors. This will improve the EU's security of supply, resilience and technological sovereignty in the field of chips.

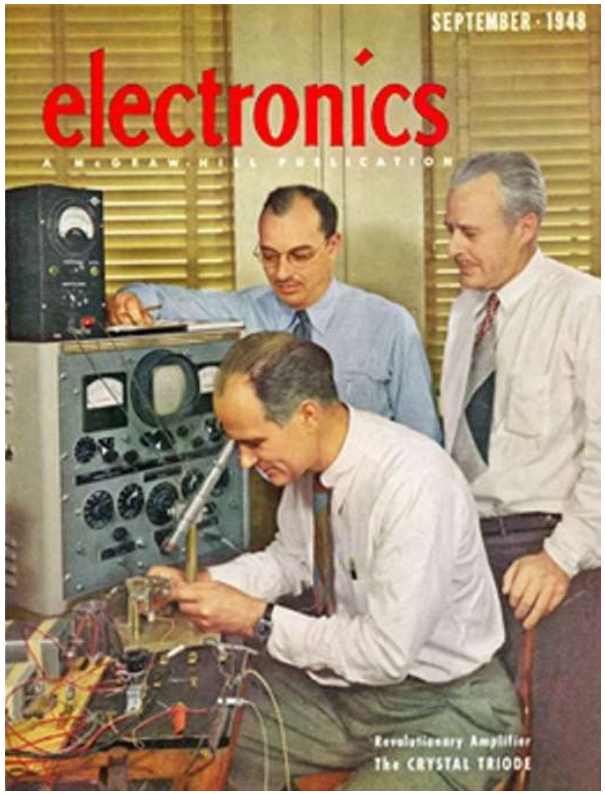
The Council adopted its position on the Chips Act on 1 December 2022.

Council of the European Union

The first transistor: 1947

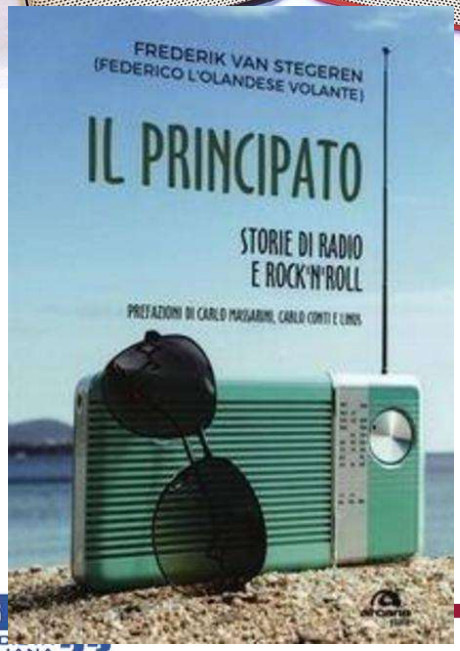
The first transistor on Germanium: **December 1947,** John Bardeen and Walter Brattain, in the group lead by William Shockley at Bell Telephone Laboratories, NJ, USA





A success: the transistor-based portable radio

- The portable (pocket) radio (**50s – 60s**) → the first mass production involving transistors (millions)
- Huge economic, social, scientific impact
- A Japanese success, SONY *in primis* (TR-63): the Japanese governmental support
- **1959**: Japan world leader in the Ge transistor production
- **1957**: the birth of Società Generale Semiconduttori in Italy → STMicroelectronics



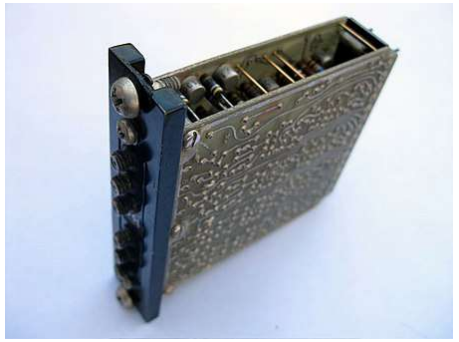
life.augmented

Transistors and computers

The Fairchild 2N709 was a fast (3-ns switching time) and reliable BJT developed by Fairchild Semiconductor under CDC (Control Data Corporation) requirements. Jean Amédée Hoerni met the specification by combining "gold-doping" together with the new epitaxial deposition process. The 2N709 npn device was introduced in **July 1961** as the **first silicon transistor to exceed germanium speed**.


TO18

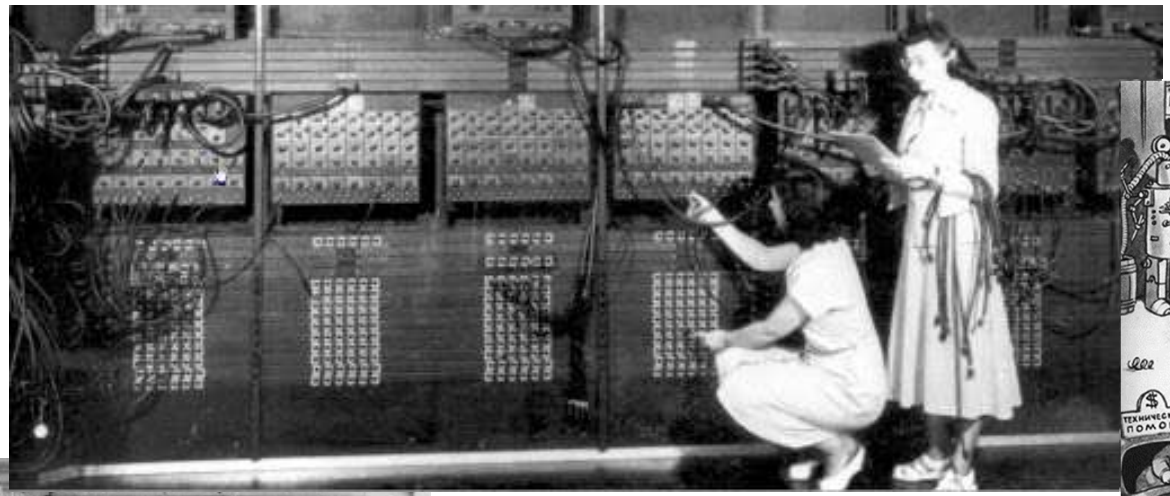
The **CDC 6600** was the **first successful supercomputer**, outperforming the industry's prior recordholder, the IBM 7030 Stretch, by a factor of three (3 Mflops). The CDC 6600 was the world's fastest computer from **1964 to 1969**, when it relinquished that status to its successor, the CDC 7600. The first CDC 6600's were delivered in **1965** to Livermore and Los Alamos; then others followed, including the Courant Institute of Mathematical Sciences, CERN, the Lawrence Radiation Laboratory. At least 100 were delivered in total.

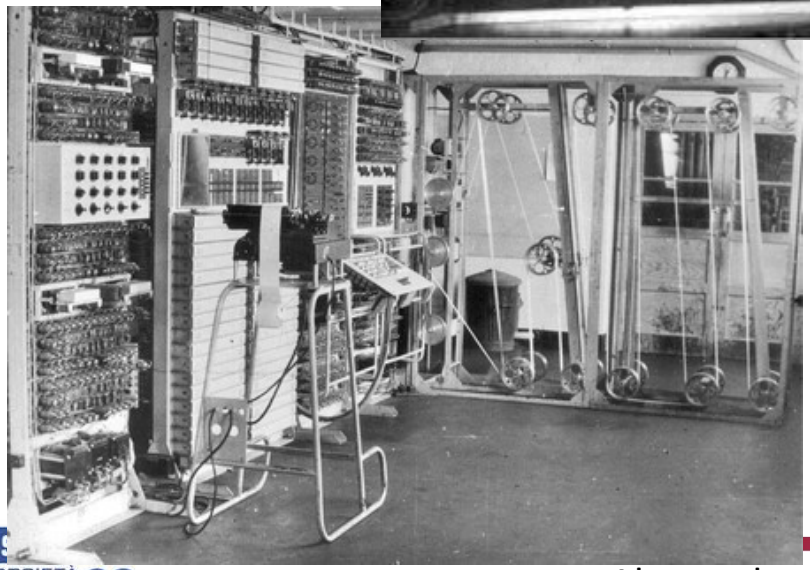


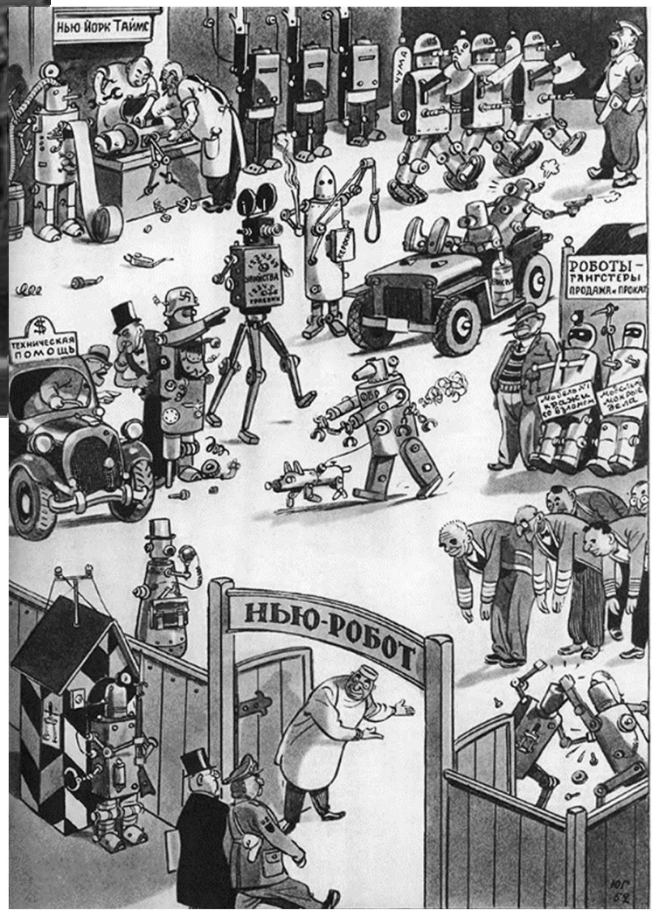
A CDC 6600 cordwood logic module containing **64 silicon transistors**. The module is cooled conductively via the front panel. The 6600 model contained nearly 6,000 such modules

Electronic computers: vacuum tubes

The ancestors: Colossus (UK, 1943) and ENIAC (USA, 1945) vs the Soviet approach







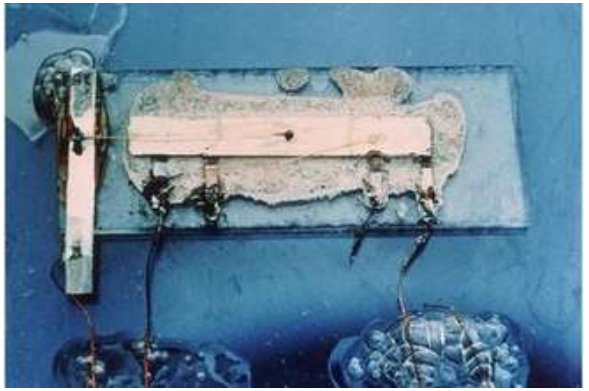
"a bourgeois pseudoscience and an ideological weapon of imperialistic reaction"

Integrated circuits

In the **Summer 1958**, **Jack Kilby**, a radio engineer and a veteran of World War II who worked at the Army lab before joining Texas Instruments, formulated three features of integration, quite inspiring even today:

1. The only thing that a semiconductor company can successfully produce is semiconductors.
2. All circuit elements, including resistors and capacitors can be made of a semiconductor.
3. All circuit components can be formed on **one semiconductor crystal**, adding only the interconnections.

On **September 12, 1958**, he presented the first IC prototype on Ge, which was a single-transistor oscillator with a distributed RC feedback.



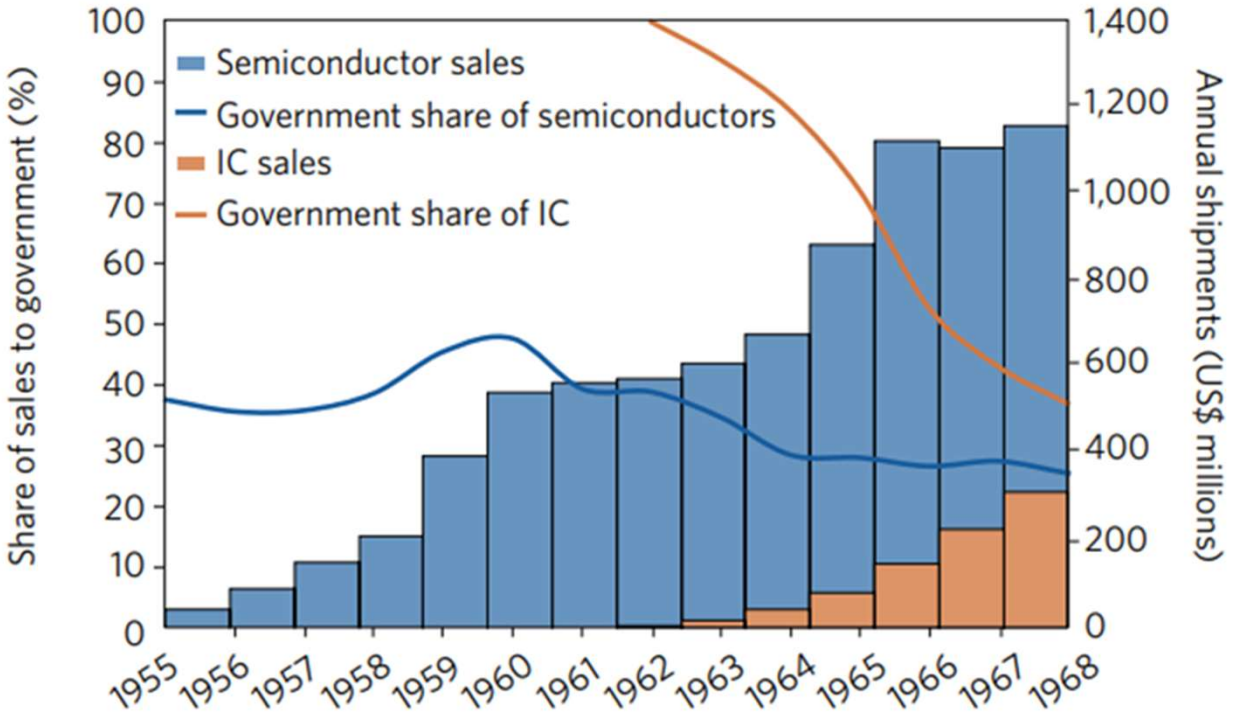
On **September 19, 1958**, he made the second prototype on Ge, a two-transistor trigger and filed several patent submissions.

Texas Instruments introduced the inventions by Kilby to the public on **March 6, 1959**.

Integrated circuits

In the years following the introduction of the integrated circuit and preceding the publication of Moore's **1965** paper, sales of integrated circuits were dominated by purchases from **government agencies** (→ aerospace, defense).

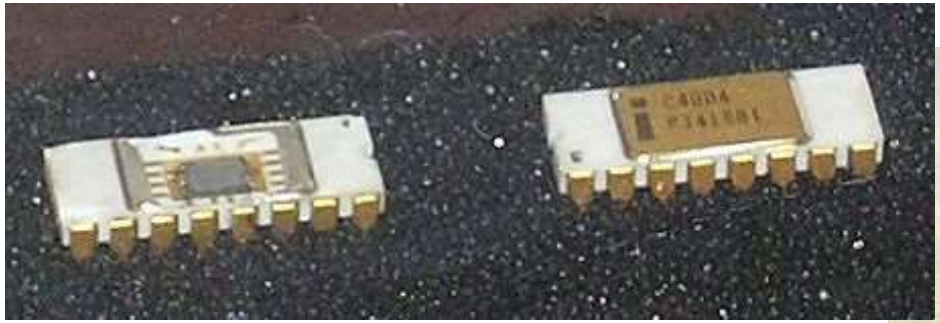
NASA's Apollo Program was the **largest single consumer of integrated circuits** between **1961 and 1965**.

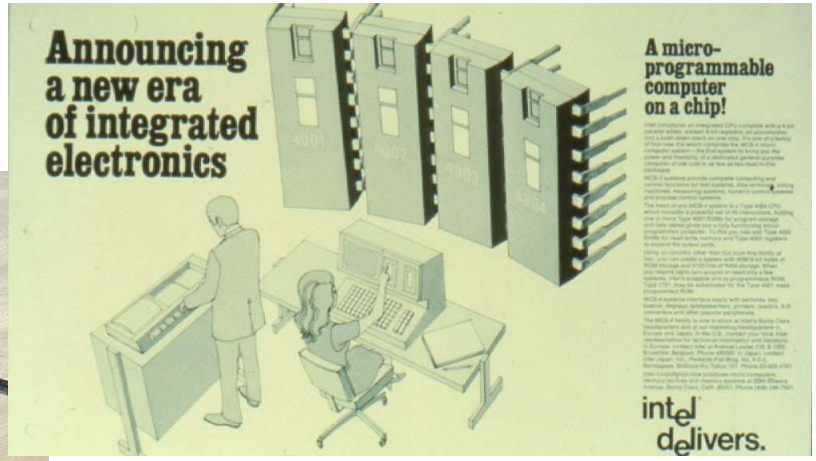


This high initial cost means ICs are only commercially viable when high production volumes are anticipated.

The first commercial microprocessor: 1971

- **1971 - INTEL 4004: the first microprocessor** (2300 MOSFETs, Silicon gate technology)
- **Federico Faggin**, born in Vicenza, laurea in Physics at Unipd, then emigrated in California
- Microprocessor → powerful computation, easy, small size and cheap → home computer → PC IBM (1981) → economic and social revolution: **communication and information society**
- In the same year, another microprocessor (the MP944 chipset, manufactured by American Microsystems, Inc) was already flying aboard the F-14 Tomcat fighter

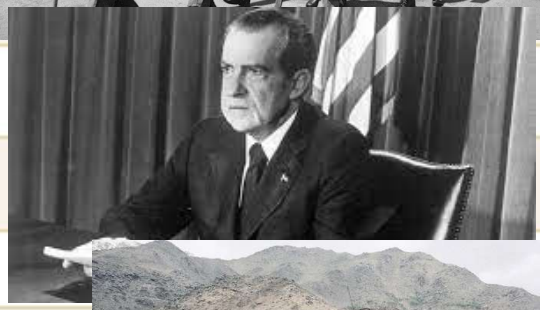




Microprocessors in the Soviet bloc

YEAR		U.S.A.	U.S.S.R.	EST GERMANY
1971	*First Generation*	Intel 4004 Intel 8008		
1972				
1973	*Second Generation*	Intel 8080 Motorola 6800		
1974			K536	
1975	*Third Generation*	Zilog Z80 Intel 8748		
1976				
1977	*16 bit*	Intel 8086 Motorola 68000		
1978			K58X Families K580	
1979				U880
1980				
1981			K18XX First seen	
1982	*32 bit*			

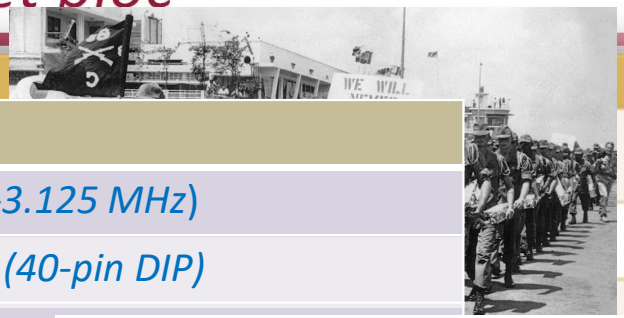
U.S. withdraws from Vietnam



Watergate scandal and
Nixon's resignation

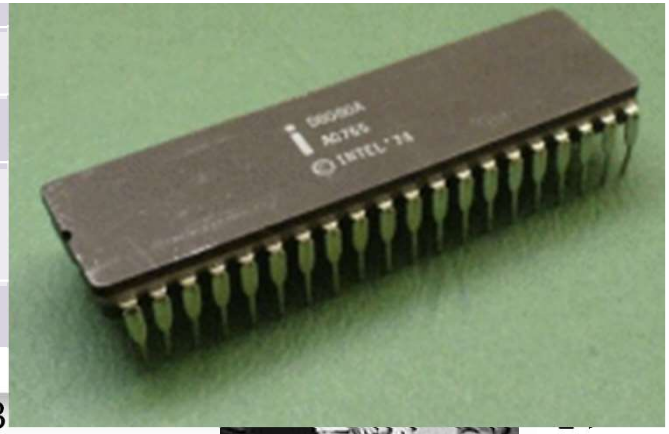
U.S.-Iran hostage crisis & U.S.S.R. war in Afghanistan

Microprocessors in the Soviet bloc



YEAR	U.S.A.	U.S.S.R.	EST GERMANY
1971	First Ge		
1972			
1973	Second		
1974			
1975	Third G		
1976			
1977	16 bit		
1978			
1979			
1980			
1981			
1982	32 bit		

General information – the USSR KR580VM80A	
Frequency	2.5 MHz *(8080: 2-3.125 MHz)*
Package	40-pin plastic DIP *(40-pin DIP)*
Socket	DIP40
Architecture / Microarchitecture	
Manufacturing process	NMOS *(NMOS)*
Data width	8 bit *(8 bit)*
Physical memory	64 kB *(64 kB)*
Electrical / Thermal parameters	
V core	5V *(5 V)*
V I/O or secondary	12V *(5 V TTL I/O, 12 V)*
V tertiary	-5V *(-5 V)*
Minimum/Maximum operating temperature	-10°C - 70°C *(0 – 70°C *)*
Maximum power dissipation	1.325 Watt *(1.4 W *)*

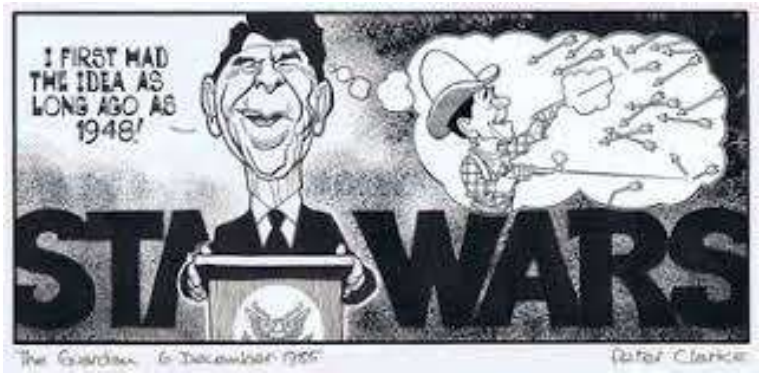


GaAs and the SDI

1983: *the 40th US President, Ronal Reagan (1981-1989), launched the Strategic Defense Initiative, also nicknamed "Star wars program", that spurred also large technological development), in particular on GaAs concerning our interest.*

After some preliminary work, a workable IC fabrication technology became available, taking advantage from the **high electron mobility** inherent to GaAs, which translates into improved speed and power. This advantage of GaAs plus its inherent **radiation hardness** made it a natural for military research. Realizing this, in **the mid-1970's** the Defense Sciences Office (DSO) of **DARPA** had already started a technology-based program to develop GaAs digital circuits.

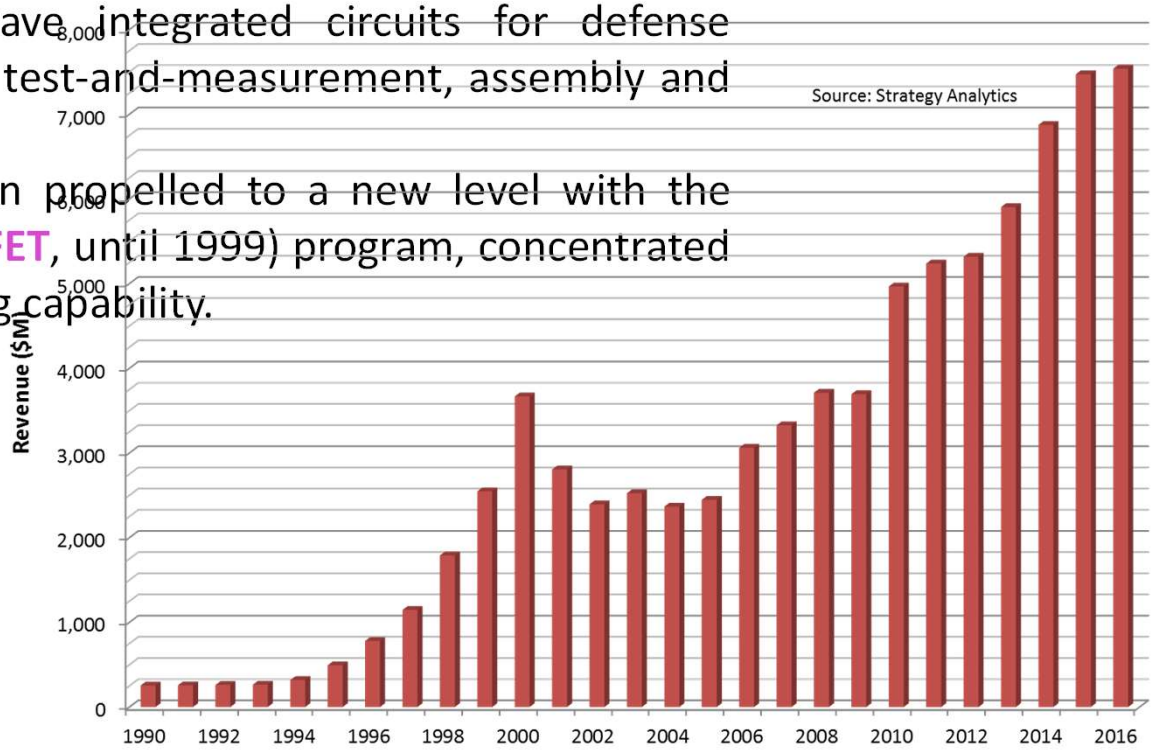
By the **end of the 80s**, the **DoD had funded a successful GaAs Pilot Line program** that sought to develop **GaAs digital ICs to compete with Si**. However, the advantages of Si, including an established infrastructure and lower cost, prevailed and the GaAs digital IC goal was eventually not achieved.



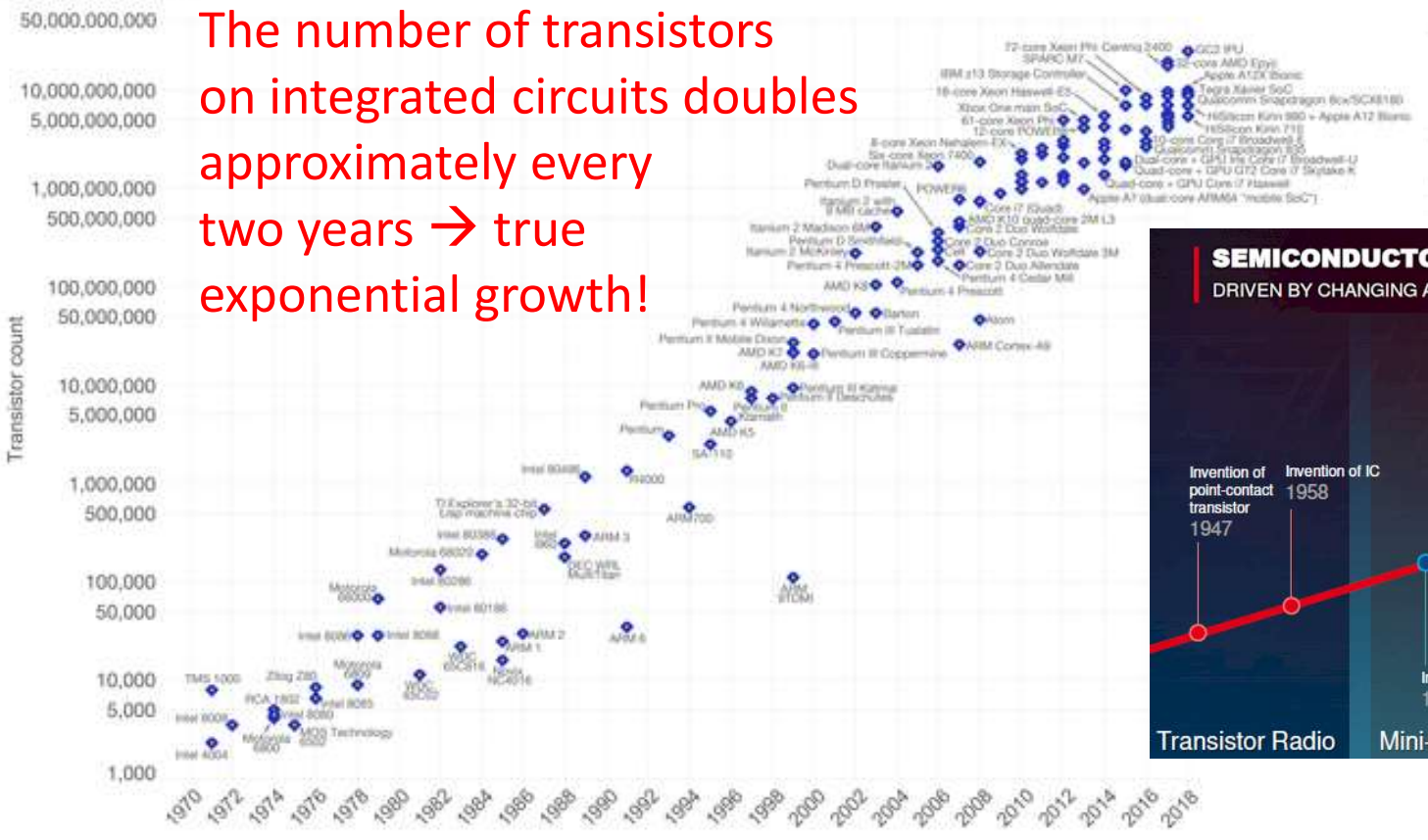
This led the US government to switch its funding to the refinement of GaAs MESFET technology and the development of **high-frequency GaAs amplifiers** within the **Microwave/Millimeter Wave Monolithic Integrated Circuits (MIMIC)** program.

Running until 1995, the MMIC programme had an incredible level of financial support, with **DARPA pumping in an estimated $400 million**. Although the initial focus was on microwave and millimeter-wave integrated circuits for defense applications, it also helped develop and refine test-and-measurement, assembly and manufacturing capabilities.

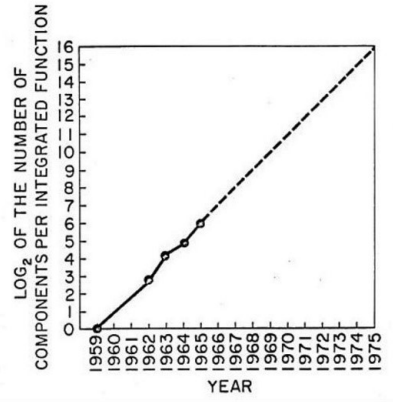
Test and manufacturing capabilities were then propelled to a new level with the **Microwave Analog Front End Technology (MAFET**, until 1999) program, concentrated on developing multi-chip module manufacturing capability.



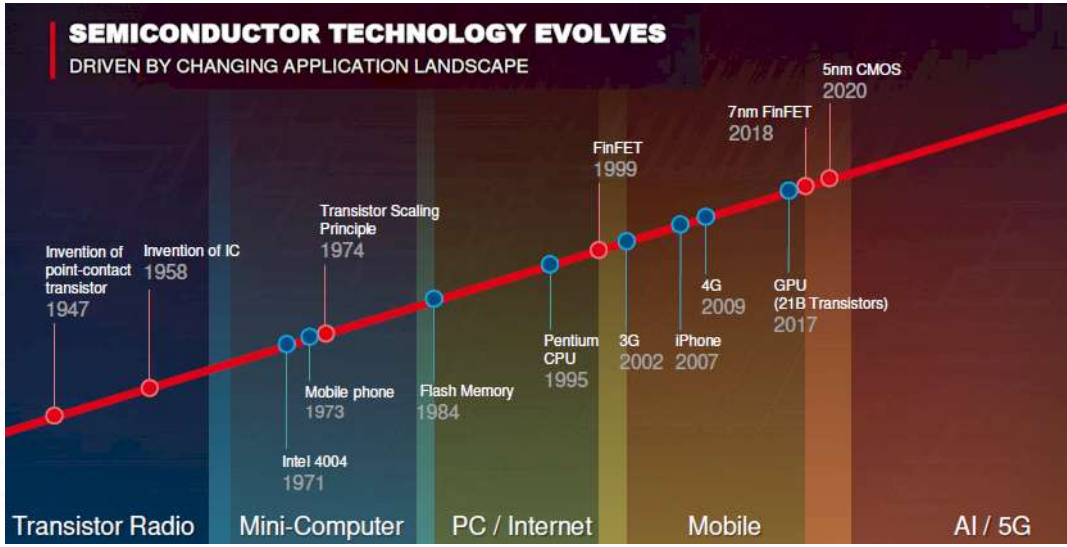
Moore's law



The number of transistors on integrated circuits doubles approximately every two years → true exponential growth!

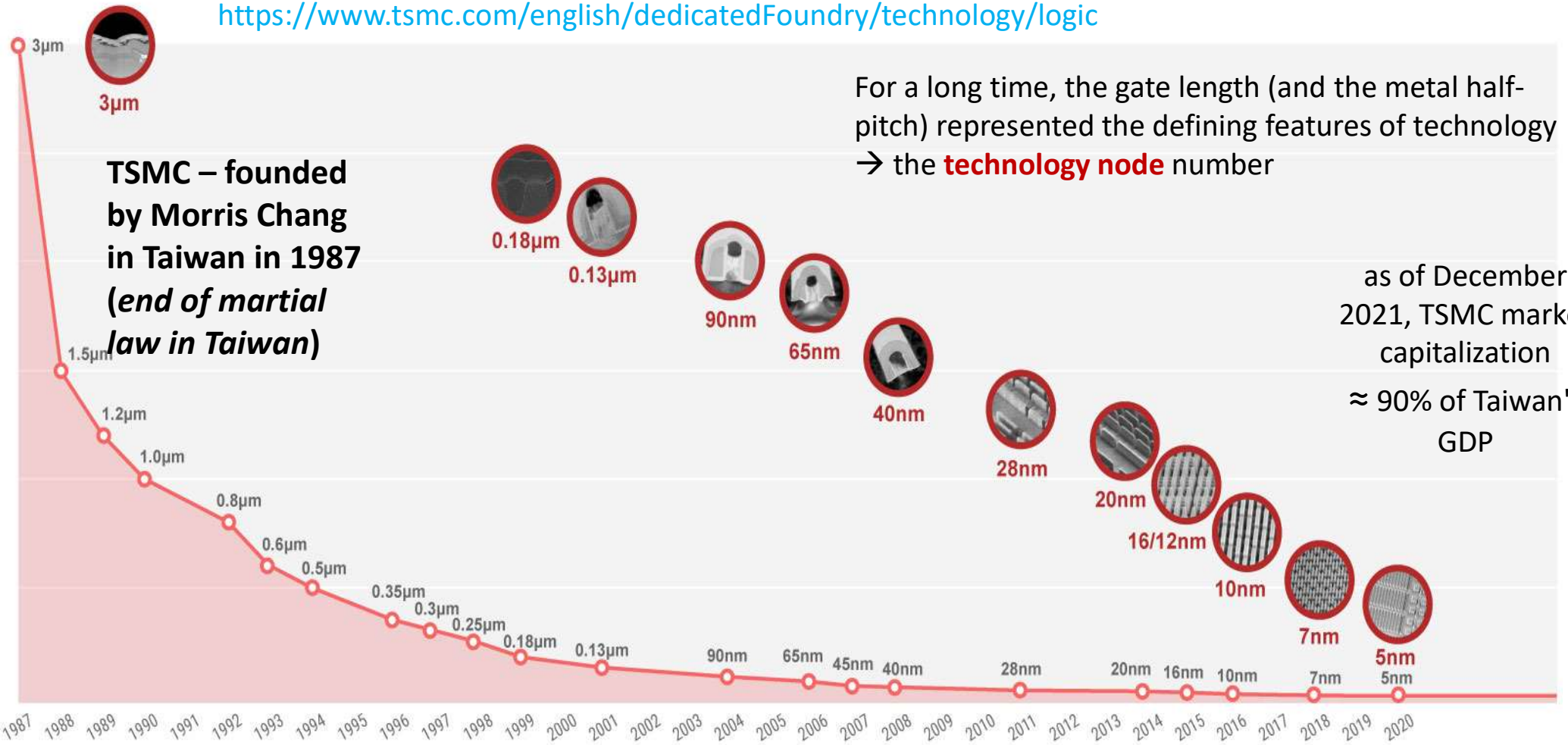


G. Moore, "Cramming more components onto integrated circuits", Electronics, Volume 38, Number 8, April 19, 1965



TSMC

https://www.tsmc.com/english/dedicatedFoundry/technology/logic



TSMC – founded by Morris Chang in Taiwan in 1987 (*end of martial law in Taiwan*)

For a long time, the gate length (and the metal half-pitch) represented the defining features of technology
→ the **technology node** number

as of December 2021, TSMC market capitalization
≈ 90% of Taiwan's GDP

Semiconductor market leaders - 1985-2011

Worldwide Semiconductor Sales Leaders ($B)

Rank	1985		1990		1995		2000		2006		2011F	
1	NEC	2.1	NEC	4.8	Intel	13.6	Intel	29.7	Intel	31.6	Intel	50.6
2	TI	1.8	Toshiba	4.3	NEC	12.2	Toshiba	11.0	Samsung	19.7	Samsung	34.5
3	Motorola	1.8	Hitachi	3.9	Toshiba	10.6	NEC	10.9	TI	13.7	Toshiba	13.5
4	Hitachi	1.7	Intel	3.7	Hitachi	9.8	Samsung	10.6	Toshiba	10.0	TI	12.8
5	Toshiba	1.5	Motorola	3.0	Motorola	8.6	TI	9.6	ST	9.9	Renesas	11.3
6	Fujitsu	1.1	Fujitsu	2.8	Samsung	8.4	Motorola	7.9	Renesas	8.2	ST	9.6
7	Philips	1.0	Mitsubishi	2.6	TI	7.9	ST	7.9	Hynix	7.4	Qualcomm*	9.6
8	Intel	1.0	TI	2.5	IBM	5.7	Hitachi	7.4	Freescale	6.1	Hynix	9.4
9	National	1.0	Philips	1.9	Mitsubishi	5.1	Infineon	6.8	NXP	5.9	Micron	8.7
10	Matsushita	0.9	Matsushita	1.8	Hynudai	4.4	Philips	6.3	NEC	5.7	Broadcom*	7.1
Top 10 Total ($B)		13.9		31.8		86.3		108.1		118.2		167.1
Semi Market ($B)		23.3		54.3		154		218.6		264.6		321.3
Top 10 % of Total Semi Mrkt		60%		59%		56%		49%		45%		52%

Source: IC Insights

*Fabless

1990:

6 JAP, 3 US, 1 EU

2000:

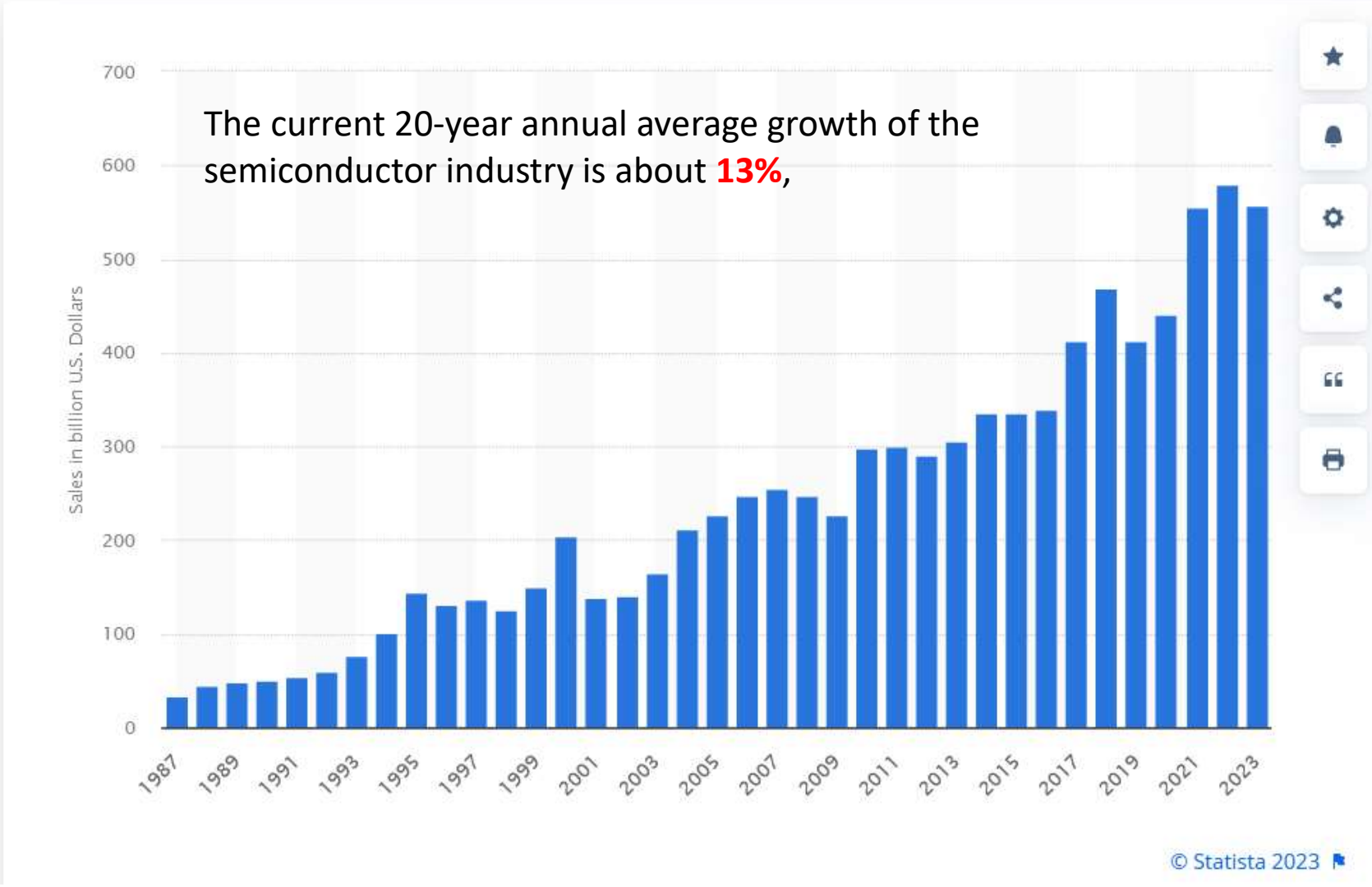
3 JAP, 3 US, 3 EU, 1 KOR

2011:

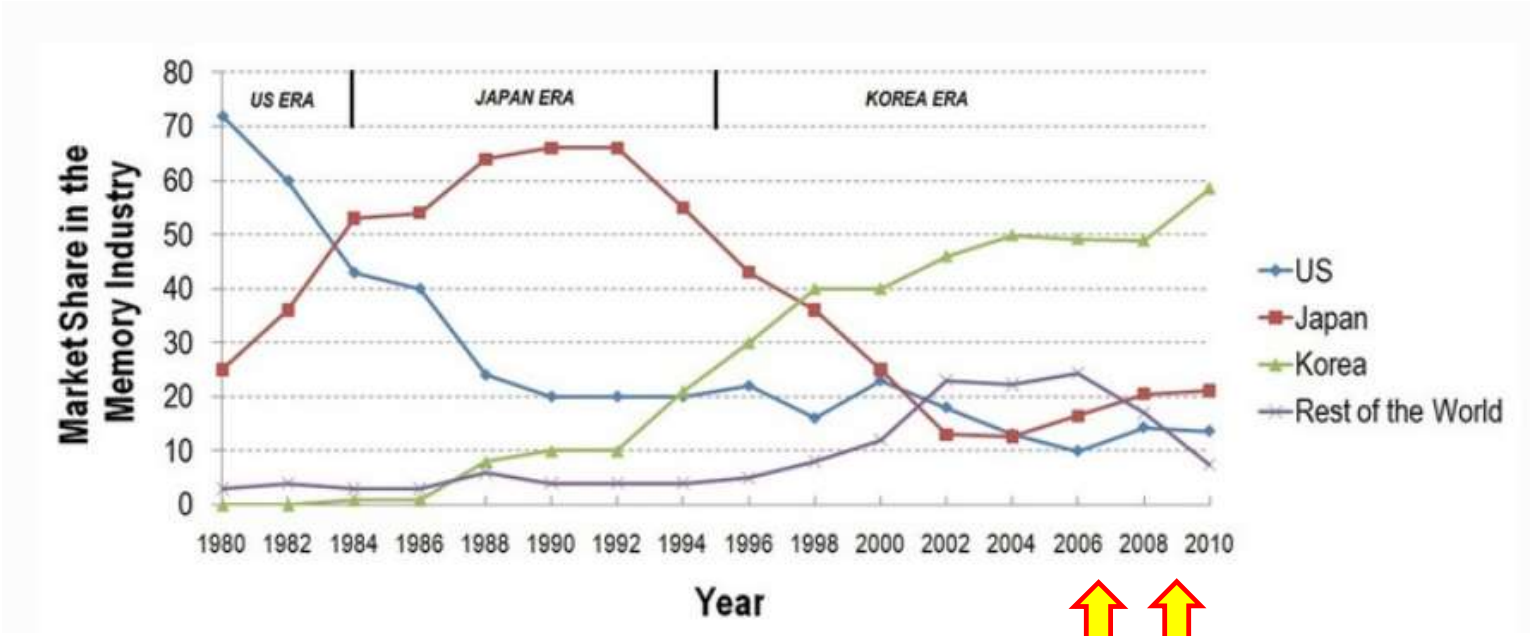
5 US, 2 KOR, 2 JAP, 1 EU

Semiconductor market size worldwide from 1987 to 2023

(in billion U.S. dollars)



The DRAM war



https://m.pulsenews.co.kr/view.php?year=2022&no=612193

Semiconductor market leaders - 1985-2011

Worldwide Semiconductor Sales Leaders ($B)

Rank	
1	NE
2	TI
3	Moto
4	Hitac
5	Tosh
6	Fujit
7	Phili
8	Inte
9	Natio
10	Matsu
Top 10 Total ($B)	
Semi Market ($B)	
Top 10 % of Total Semi I	

Source: IC Insights

1990:

2000:

2011:

2020:

Hyundai electronics(1983): merge with

nix (2001)

8) →

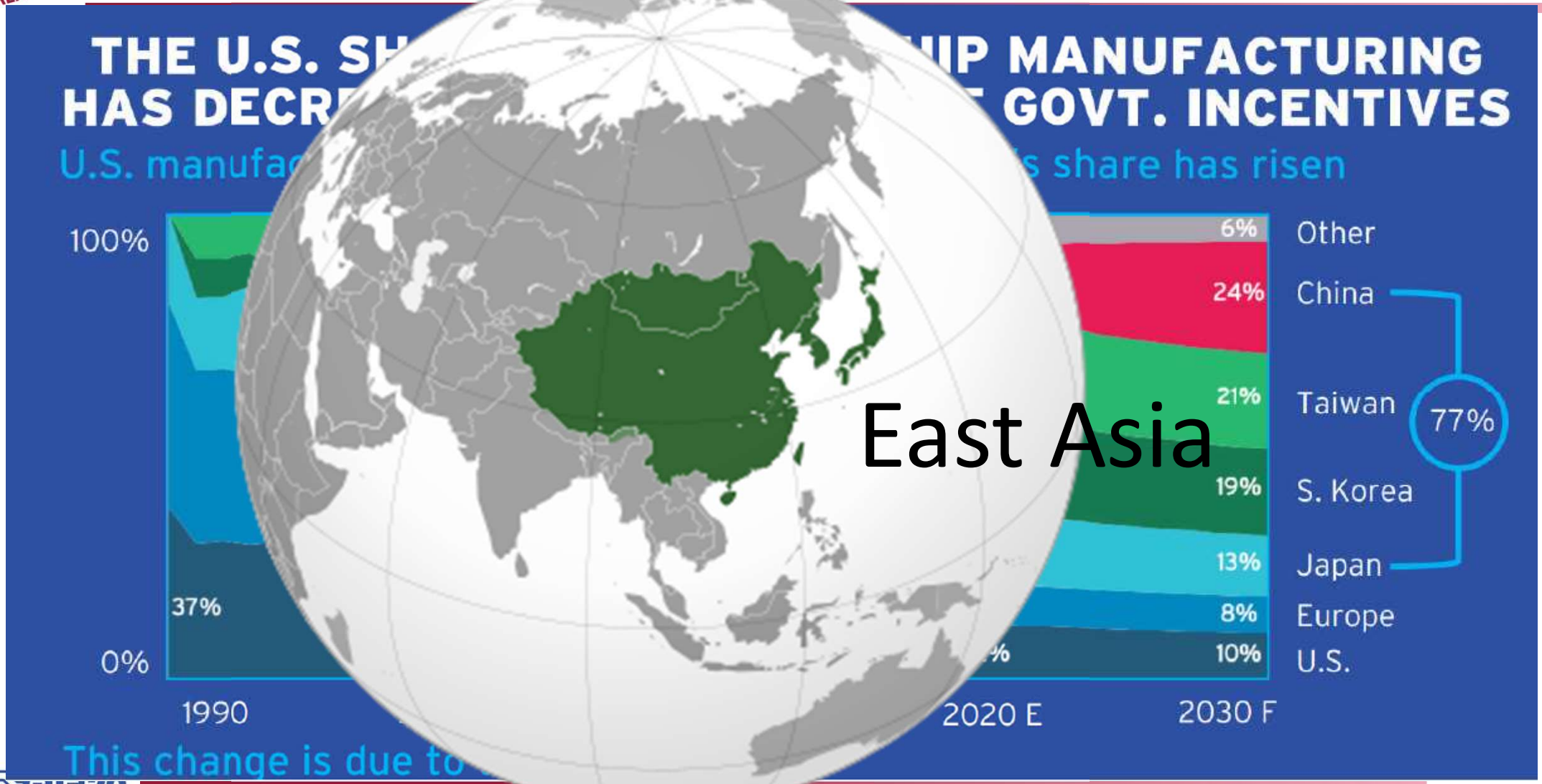
Semiconductor Companies with >$10 Billion in Sales in 2021F

2021F Rank	2020 Rank	Company	Headquarters	2020 Total IC	2020 Total O-S-D	2020 Total Semi	2021F Total IC	2021F Total O-S-D	2021F Total Semi	2021/2020 % Change
1	2	Samsung	South Korea	58,555	3,298	61,853	78,850	4,235	83,085	34%
2	1	Intel	U.S.	76,328	0	76,328	75,550	0	75,550	-1%
3	3	TSMC (1)	Taiwan, China	45,572	0	45,572	56,633	0	56,633	24%
4	4	SK Hynix	South Korea	26,094	981	27,075	35,628	1,639	37,267	38%
5	5	Micron	U.S.	22,542	0	22,542	30,087	0	30,087	33%
6	6	Qualcomm (2)	U.S.	19,357	0	19,357	29,136	0	29,136	51%
7	8	Nvidia (2)	U.S.	14,659	0	14,659	23,026	0	23,026	57%
8	7	Broadcom Inc. (2)	U.S.	15,941	1,803	17,744	18,864	2,099	20,963	18%
9	12	MediaTek (2)	Taiwan, China	10,985	0	10,985	17,551	0	17,551	60%
10	9	TI	U.S.	12,731	843	13,574	15,889	1,015	16,904	25%
11	15	AMD (2)	U.S.	9,763	0	9,763	16,108	0	16,108	65%
12	11	Infineon	Europe	7,542	3,683	11,225	9,113	4,503	13,616	21%
13	10	Apple* (2)	U.S.	11,440	0	11,440	13,430	0	13,430	17%
14	14	ST	Europe	6,804	3,374	10,178	8,400	4,174	12,574	24%
15	13	Kioxia	Japan	10,553	0	10,553	12,132	0	12,132	15%
16	17	NXP	Europe	7,582	809	8,391	9,711	1,004	10,715	28%
17	19	Analog Devices (3)	U.S.	7,722	405	8,127	9,575	504	10,079	24%
—	—	Top-25 Total		364,170	15,196	379,366	459,683	19,173	478,856	26%

(1) Foundry (2) Fabless (3) Includes aquired company's sales in 2020 and 2021 results.

Source: Company reports, IC Insights *Custom devices for internal use.

The international context



War winds in the Far East?

PLANET MONEY

Forging Taiwan's Silicon Shield

October 7, 2022 · 7:56 PM ET


KENNY MALONE


RAMTIN ARABLOUEI

The Chinese Communist Party claims Taiwan is — and has always been — a part of China. Meanwhile, many on the island say Taiwan is independent of China and a self-governed democracy. One thing that may be protecting the island in this global feud: semiconductors.

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Economy | Business and Economy

Taiwan's 'silicon shield': Why island may not be the next Ukraine

The self-ruled island's dominance in semiconductors is seen by some analysts as a deterrent against an invasion by Beijing.

漢 En

Taiwan News
台灣英文新聞
VOICE OF THE PEOPLE · BRIDGE TO THE WORLD ESTABLISHED IN 1949

Home / Opinion

It's a myth that 'silicon shield' protects Taiwan from China invasion

There is no such thing as a 'silicon shield' protecting Taiwan, and propagating this myth is dangerous

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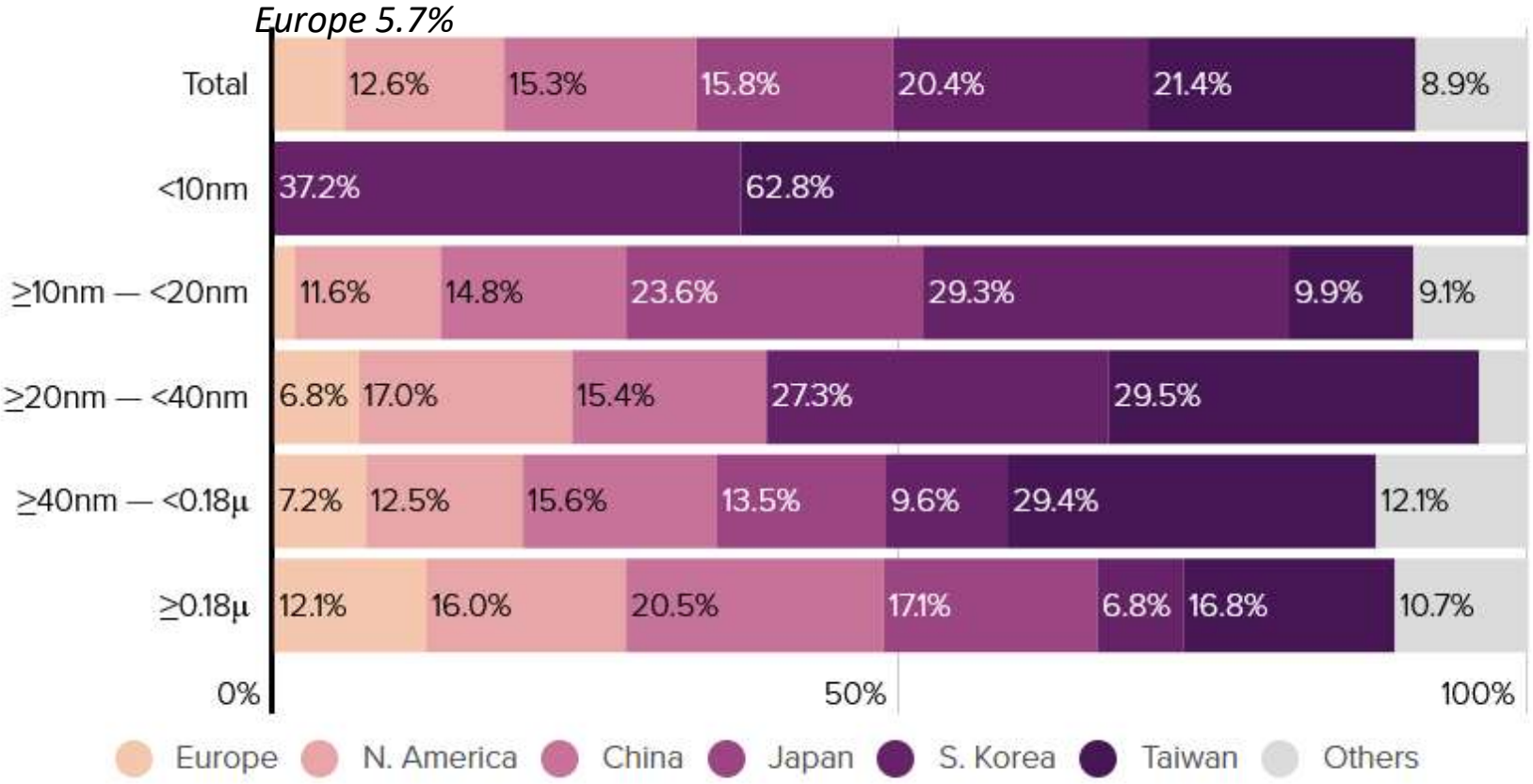
By Courtney Donovan Smith / 石東文, Taiwan News, Contributing Columnist
2022/10/10 23:44

SIE 2023 SOCIETÀ ITALIANA DI ELETTRONICA

EU within the international context



Geographical breakdown of wafer production, by region and by size (end of 2020)

Source: IC insight

https://www.politico.eu/article/europe-microchip-intel-investment-magdeburg-commission-technology/

EU and the others

Thierry Breton:

Chips are a strategic component of any industrial chain. The race for the most advanced chips is a race about **technological and industrial leadership**. Europe cannot and will not lag behind.

While global demand has exploded, Europe's share across the entire value chain, from design to manufacturing capacity has shrunk. We depend on state-of-the-art chips manufactured in Asia. So this is not just a matter of our competitiveness. This is also a matter of **tech sovereignty**. So let's put all of our focus on it.

EU Chips Act: announced 8 February, 2022, 43 B€

USA: Creating Helpful Incentives to Produce Semiconductors (**CHIPS**) for America Act, 2022, **52B US$**

China: estimated **150B US$** 2015 -2022 for semiconductor industry; 14 December, 2022: *Reuters quoting three sources reported that China will soon announce a package with more than CNY1 trillion (**US$143 billion**) to bolster its semiconductor industry towards chip self-sufficiency.*

EU and the others

Thierry Breton:

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Commission welcomes political agreement on the European Chips Act

Brussels, 18 April 2023

The Commission welcomes the political agreement reached today between the European Parliament and the EU Member States on the European Chips Act, proposed by the Commission on 8 February 2022, including on the budget.

Semiconductors are at the centre of strong geostrategic interests, and of the global technological race. For this reason, the Commission proposed the European Chips Act, which strengthens European competitiveness and resilience in this strategic sector.

Chips are the essential building blocks of digital and digitised products. From smartphones and cars, through critical applications and infrastructures for healthcare, energy, defence, communications and industrial automation, chips are central to the modern digital economy.

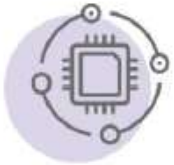
Recent shortages of semiconductors have highlighted Europe's dependency on a limited number of suppliers outside of the EU, in particular Taiwan and South-East Asia for manufacturing of chips, and the United States for their design. **To respond to critical dependencies, the European Chips Act will strengthen manufacturing activities in the Union, stimulate the European design ecosystem, and support scale-up and innovation across the whole value chain. Through the European Chips Act, the European Union aims to reach its target to double its current global market share to 20% in 2030.**

EU Chips Act

EUROPEAN CHIPS ACT

The European Chips Act will ensure that the EU strengthens its semiconductors ecosystem, increases its resilience, as well as ensure supply and reduce external dependencies.

1. Strengthen Europe's research and technology leadership towards smaller and faster chips



2. Build and reinforce capacity to innovate in the design, manufacturing and packaging of advanced chips

3. Put in place a framework to increase production capacity to 20% of the global market by 2030

4. Address the skills shortage, attract new talent and support the emergence of a skilled workforce

5. Develop an in-depth understanding of the global semiconductor supply chains

The Chips Act should result in additional public and private investments of more than **€15 billion**.

These investments will complement:

- **existing programmes** and actions in research & innovation in semiconductors (Horizon Europe, Digital Europe programme)
- **announced support** by Member States.

In total, **more than €43 billion of policy-driven investment will support the Chips Act until 2030**, which will be broadly matched by long-term private investment.

EU Chips Act

intel PRODUCTS SUPPORT SOLUTIONS DEVELOPERS PARTNERS

Intel Newsroom / Intel, Germany Agree on Increased Scope for Site

Intel, German Government Agree on Increased Scope for Wafer Fabrication Site in Magdeburg

Agreement accounts for Intel's expanded investment to build two leading-edge semiconductor facilities in Germany.

News

June 19, 2023

The Chips Act should result in additi

These investments will complement

- **existing programmes** and ac programme)
- **announced support** by Memb

In total, **more than €43 billion of** broadly matched by long-term priva

BERLIN, June 19, 2023 — Intel and the German federal government have signed a revised letter of intent for Intel's planned leading-edge wafer fabrication site in Magdeburg, the capital of Saxony-Anhalt state in Germany. The agreement encompasses Intel's expanded investment in the site, now expected to be more than 30 billion euros for two first-of-a-kind semiconductor facilities (also known as "fabs") in Europe, along with increased government support that includes incentives, reflecting the expanded scope and change in economic conditions since the site was first announced.

EU Chips Act

REUTERS® World Business Markets Sustainability Legal Breakingviews Technolo

as well as

Technology

Germany spends big to win $11 billion TSMC chip plant

By **Ben Blanchard** and **Thomas Escritt**

August 8, 2023 5:30 PM GMT+2 · Updated 24 days ago

TAIPEI/BERLIN, Aug 8 (Reuters) - Taiwanese chipmaker TSMC on Tuesday committed 3.5 billion euros ($3.8 billion) to a factory in Germany, its first in Europe, taking advantage of huge state support for the $11 billion plant as the continent seeks to bring supply chains closer to home.

The plant, which will be TSMC's (2330.TW) third outside of traditional manufacturing bases Taiwan and China, is central to Berlin's ambition to foster the domestic semiconductor industry its car industry will need to remain globally competitive.

EU Chips Act

EUROPEAN CHIPS ACT

Floris Hulshoff Pol

June 6, 2023

1 min

Tags in this article

Globalfoundries, semiconductor industry, STMicroelectronics

The French government is subsidizing a new chip factory by STMicroelectronics and GlobalFoundries to the tune of 2.9 billion euros. The subsidy is part of a larger French plan for the semiconductor industry.

The chip makers' new factory is located in Crolles near the city of Grenoble. The chips that the factory will produce are primarily for the (French) automotive industry, but also industrial IoT (IIoT) applications. The chips in question are mainly 18 nm chips.

The arrival of the factory should create a thousand jobs. The entire construction of the factory, including the €2.9 billion subsidy from the French state, will cost €7.5 billion. Production at the new chip factory should increase French chip production by 6 percent annually. This is about 620,000 wafers per year.

In total, **more than €43 billion of policy-driven investment will support the Chips Act until 2030**, which will be broadly matched by long-term private investment.

EU Chips Act

intel

PRODUCTS SUPPORT SOLUTIONS DEVELOPERS PARTNERS

Intel Newsroom / **Intel Plans Assembly and Test Facility in Poland**

Intel Plans Assembly and Test Facility in Poland

Investment near Wrocław, Poland, will help create a first-of-its-kind end-to-end leading-edge manufacturing semiconductor value chain in Europe.

leadership towards the
smaller and faster chips

News

June 16, 2023

Contact Intel PR

NEWS HIGHLIGHTS

- Investment of up to $4.6 billion will create approximately 2,000 Intel jobs and thousands of indirect supplier and temporary construction jobs.
- The new facility will help meet demand for assembly and test capacity anticipated in coming years.
- Facilities will be constructed according to green building principles and will operate with high environmental standards to minimize carbon footprint and environmental impact.
- Intel's investment will help the European Union work toward its goal of a more resilient semiconductor supply chain.

the state-of-the-art semiconductor assembly/test facility that Intel announced plans
, Poland. Announced on June 16, 2023, the site will help to meet demand for
capacity that Intel anticipates by 2027. (Credit: Intel Corporation)

Italy

Un “momento storico” per i rapporti Italia-Francia: firmato il Trattato del Quirinale

PUBBLICATO IL 26 NOVEMBRE 2021 ALLE 13:00 IN EUROPA ITALIA

Il 26 novembre, il presidente francese, Emmanuel Macron, e il primo ministro italiano, Mario Draghi, alla presenza del presidente della Repubblica, Sergio Mattarella, hanno firmato il “Trattato del Quirinale”, un accordo di cooperazione bilaterale rafforzata.

europea”, ha aggiunto. A tale proposito, il premier italiano è tornato a parlare di Difesa Comune Europea, un tema particolarmente caro anche a Macron, e al rilancio degli investimenti in ambiti strategici e innovativi, citando semiconduttori, transizione digitale ed energetica e, ancora, difesa. “Dobbiamo dotare l’Unione Europea di strumenti che siano compatibili con le nostre ambizioni e con le aspettative dei nostri cittadini, il trattato che abbiamo firmato oggi segna l’inizio di questo percorso, grazie”, ha concluso Draghi.

Microchip, Draghi spinge per l’impianto Intel. Ecco i piani

Di Francesco Bechis | 22/10/2021 - Verde e blu

L’agenzia Reuters conferma che i colloqui del governo italiano c colosso americano Intel per costruire un maxi-impianto di proc chip in Italia sono in fase avanzata. In Germania una megafacto Mirafiori in pole per il packaging. La rete di Draghi e Giorgetti pe Paese un hub europeo

Italia e Germania sono in pole per ospitare due maxi-impianti di produzione di chip dell’americana Intel. Un’indiscrezione di *Reuters* svela il lavoro dietro le quinte del governo Draghi per chiudere un accordo da miliardi di euro che farebbe dell’Italia un hub internazionale per i semiconduttori.

Business 16/03/2022 15:00

Intel investirà 80 miliardi in Europa in dieci anni. In Italia ne arriveranno 4,5

Di **Gabriele Di Matteo**
Staff

U Chips Act

its semiconductors ecosystem, increases its resilience, as well as

MENU Agenda Digitale Cittadinanza digitale Sicurezza Informatica Sanità digitale Indust

MICROELETTRONICA

Semiconduttori, Italia avanti tutta: ecco la strategia

Home > Mercati Digitali

Sulla scia del "Chips Act" verso l'autosufficienza tec nuova era di innovazione nazionale e internazionale

Pubblicato il 11 ago 2023

Luisa Franchina
Presidente Associazione Italiana espert

Tommaso Ruocco
Junior Analyst Hermes Bay

The Chips Act sho

These investment

- **existing pro** programme)
- **announced**

In total, **more tha** broadly matched

Gli investimenti dell'Italia nel settore dei semiconduttori

I recenti provvedimenti del 7 agosto, con stanziamenti di **30 milioni** da parte del Consiglio dei ministri, oltre al credito d'imposta e agli investimenti di **oltre 600 milioni** previsti nel Decreto Omnibus, sono integrati da **ulteriori finanziamenti significativi**. Il Piano nazionale di ripresa e resilienza prevede **50 milioni per la ricerca e lo sviluppo dei semiconduttori** a livello nazionale.

Vittorio Privitera, direttore dell'Istituto per la microelettronica e microsistemi del Consiglio Nazionale delle Ricerche, sottolinea l'importanza di tali finanziamenti, inclusi i 40 milioni del **progetto Beyond Nano a Catania**, provenienti da Regione Sicilia, Cnr e Mur, e i 10 milioni dell'iniziativa europea Ipcei 2.

For a better comprehension

DEI - Dipartimento di Ingegneria dell'Informazione Unipd
17 novembre alle ore 14:42 ·

Per chi si fosse perso il programma di Radio3 Scienza dedicato ai 50 anni del microchip eccovi il podcast pronto da riascoltare!

Ospiti del programma il nostro prof. Alessandro Paccagnella e il professor David Burigana del Scienze Politiche, Giuridiche e Studi Internazionali (SPGI).

Insieme, i due professori, nel secondo semestre, terranno il corso di Microelectronics & Globalization, in cui approfondiranno proprio le importanti sfide geopolitiche che coinvolgono sia le nazioni che li producono, che quelle che forniscono le materie prime.

Link al podcast: https://www.raiplayradio.it/.../RADIO3-SCIENZA-8b520473...

Approfondimento su Microelectronics and Globalization: https://www.dei.unipd.it/.../microelectronics-and...

DEI - Dipartimento di Ingegneria dell'Informazione Unipd
6 settembre ·

If you're starting to plan the courses you want to attend next year, there's something you should know:! The next academic year is bringing something new:
On the #2nd_semester, two apparently distant departments of the University of Padua created a new innovative course, that has no equals in Italy:
#Microelectronics and #Globalization.

Professors Alessandro Paccagnella (#Deiunipd) and David Burigana (#SPGI – Dept. of Political Sciences, Law, and International Studies) will lead you into the understanding of the deep connections between #technology and #geopolitics through the #microelectronics' focus.

Learn more about the course here: https://www.dei.unipd.it/.../microelectronics-and...