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# *Geopolitics and microelectronics: the evolution of the international context*

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SIE Società italiana di Elettronica 2023

Noto, 6 settembre 2023



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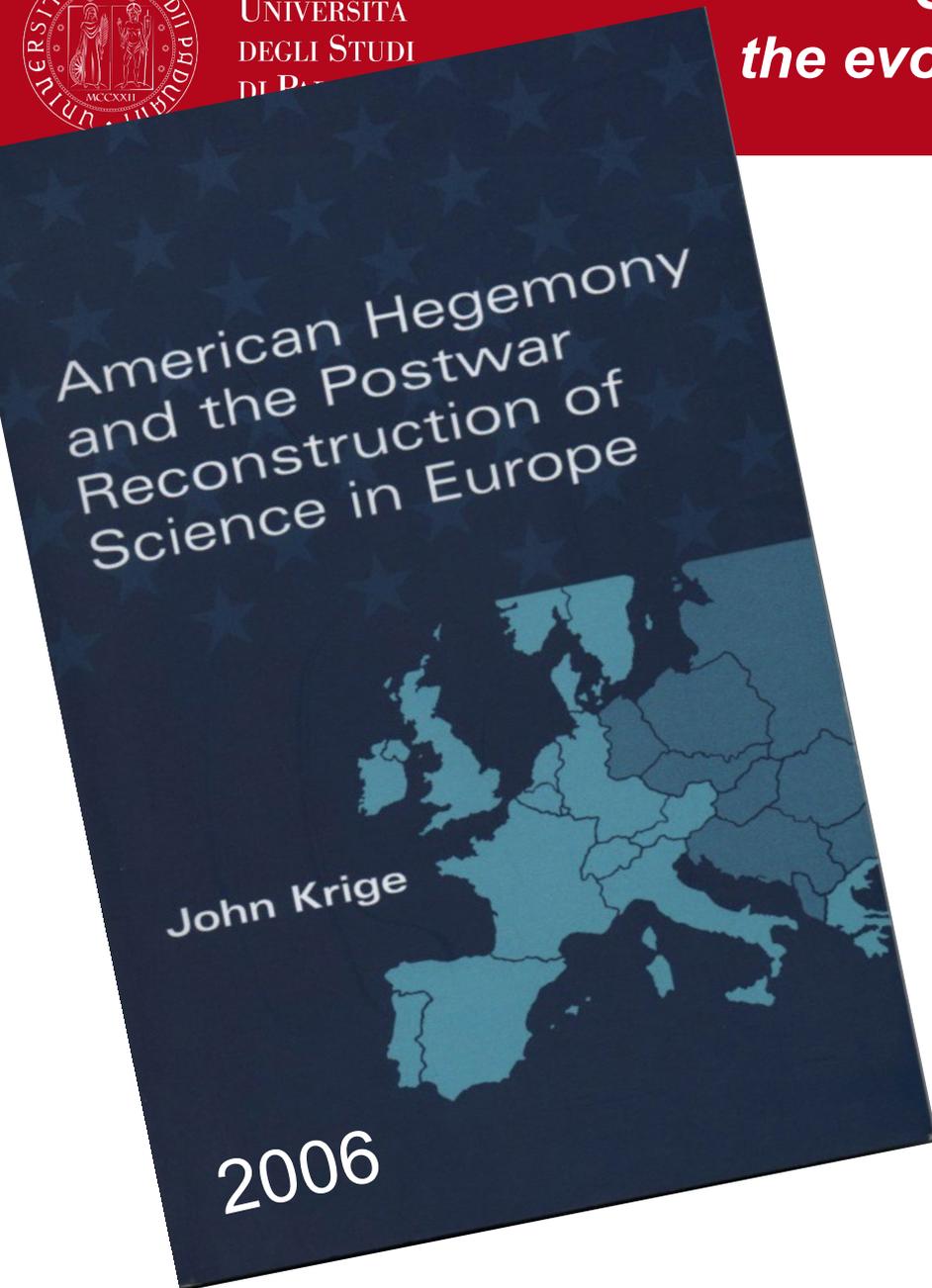
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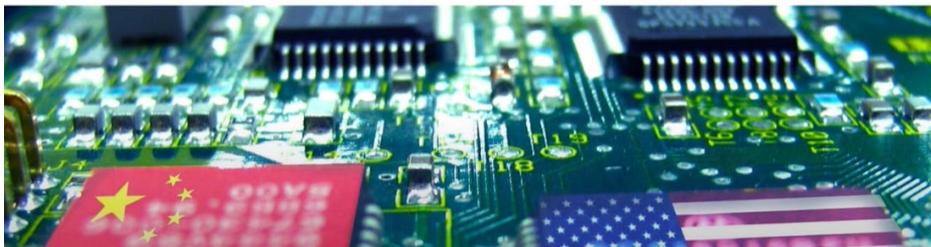


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## *Geopolitics and microelectronics: the evolution of the international context*

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*«How can Cabinet come to a sensible decision, when **none of us know what** these things really are?», Richard Crossman, Cabinet Minister (1964-70), *Diaries of a Cabinet Minister**

*«How indeed can Cabinets come to sensible judgements about the political consequences of technological ideas which they **do not usually have the time even to try to understand?**», Solly Zuckerman, HMG's Chief Scientific Adviser (1960-93), *Monkeys Mend and Missiles**



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## Experts and Expertise in Science and Technology in Europe since the 1960s

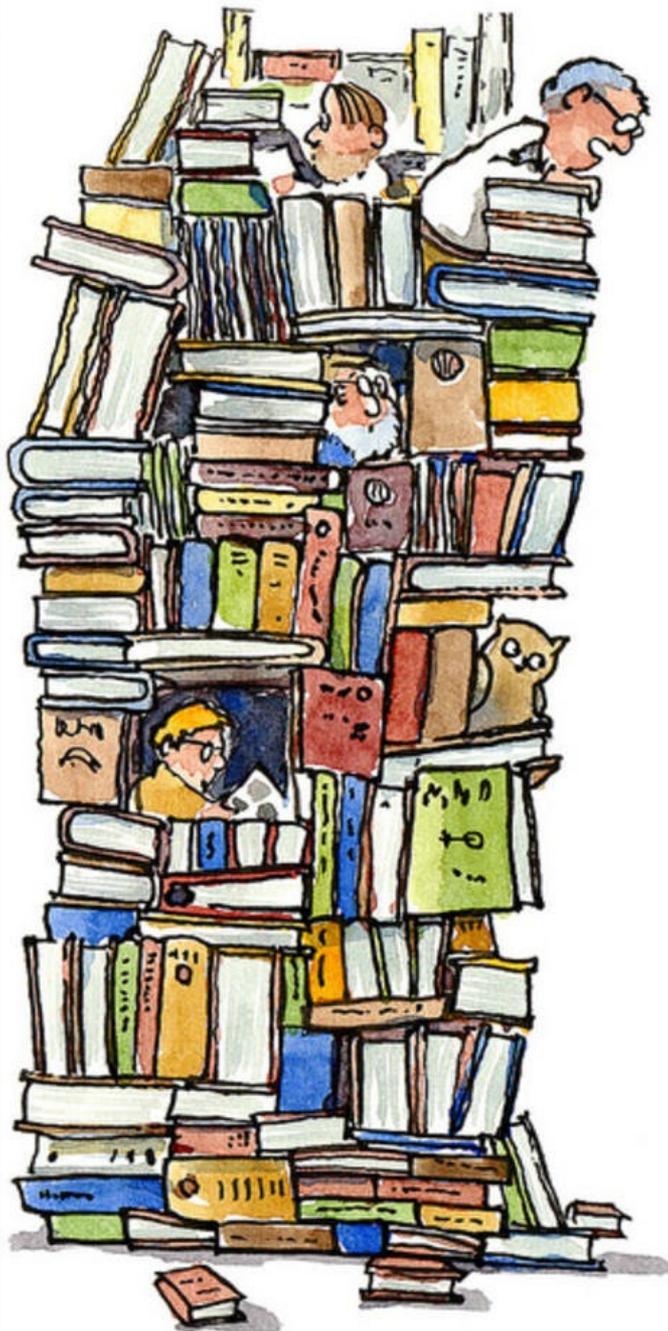
Organized Civil Society, Democracy  
and Political Decision-making

Christine Bouneau & David Burigana (eds.)

### *Ex Post: Experts and Politics on Science and Technology*

  
PETER LANG

★ EUROCLIO  
STUDIES AND DOCUMENTS



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Jean-Jacques Servan-Schreiber. Reçu à l'Ecole Polytechnique en juillet 1943. Evadé de France, cet été là, engagé volontaire dans les Forces Françaises Libres, pilote de chasse au groupe 1/5. Après la guerre, à sa sortie de Polytechnique, éditorialiste de politique étrangère au journal "Le Monde" (1948). Collaborateur de M. Pierre Mendès-France (1952-1955). Mobilisé comme Lieutenant de réserve dans l'armée d'Algérie, avec le Général de Bollardière (1956-1957). Auteur, à son retour à Paris, du livre "Lieutenant en Algérie", et inculpé par le Ministre de la Défense Nationale, M. Bourguès Maunoury d'atteinte au moral de l'Armée. Acquitté par un non-lieu. Fondateur de "L'Express". Collaborateur de M. Gaston Defferre (1963-1965). Aujourd'hui, Directeur Général du groupe de presse qui contrôle les trois sociétés : Presse-Union (L'Express), Technic-Union (magazines et informations techniques) et Liste-Union (gestion de fichiers par ordinateurs).



**LE  
DEFI  
JEAN-JACQUES  
SERVAN-SCHREIBER  
AMERICAIN  
The american  
challenge**

**1967**

**DENOËL**



**Franz Josef Strauss, *Herausforderung und Antwort, ein Programm für Europa*, Stuttgart-Degerloch, Seewald Verlag**

- (trad. fr.), **Défi et réponse. Un programme pour l'Europe**, Paris, Albin Michel, 1969
- (trad. it.), **Sfida e risposta. Un programma per l'Europa**, Milano, Mondadori, 1969



**Michele Albonetti**

***Divario tecnologico, ricerca scientifica e produttività in Europa e negli Stati Uniti***, Milano, Giuffré, 1967

**«The technological gap: proposals and documents»**, in *Lo Spettatore Internazionale*, English Edition, n. 2, Vol. II, March-April 1967

- **1958-59** Chief Cabinet of the Vice-President of **European Commission** (European Economic Community)
- **Since 1960** Director for International relations and Economic studies in Italian **National Committee for Atomic Energy**



- The «European technological community» by Harold **Wilson** which, with Airbus, was one of the pillars to convince to accept British entry in the EEC
- The «Plan Marshall de la technologie» in 1966 by Foreign Affairs Minister **Amintore Fanfani**, more exactly “il ritardo tecnologico dell’Europa e l’opportunità di una collaborazione internazionale” [*of which **Wilson** and **Fanfani** speak during Italian visit in London in June 1967 with Prime Minister Aldo Moro. Paris was opposite to*]
- Vice-President of European Commission, **Robert Marjolin**, and his proposal for an inevitable «communauté technologique» → EEC Council of Research Ministers november ‘66



## IEEE MILESTONE IN ELECTRICAL ENGINEERING AND COMPUTING

Dadda's Multiplier, 1965

Luigi Dadda published the first description of the optimized scheme, subsequently called a Dadda Tree, for a digital circuit to compute the multiplication of unsigned fixed-point numbers in binary arithmetic. This circuit allowed the arithmetic units of microprocessor-based computers to execute complex arithmetic operations with a performance/cost ratio unequaled at that time. His research and teaching pioneered computer engineering in Italy.

September 2016



**For Italy,  
with diplomat Umberto Vattani**

**Organisation for Economic  
Co-operation and  
Development (OECD), Paris**

*in working group electronics and  
computers took part Luigi Dadda*



In **October 1967**, US technology expert Robert Hotz noted, and the French Embassy in Washington reported to Paris, that

*«the most relevant difference between the American firms and the European ones is not their size, but that the first ones know **to organise big technological and economic consortia** that are able to resolve the problems of market and of firms. European incapability in this field is the most important handicap, **more than the growing technological gap** between Europe and USA»*

H. Zimmermann, « Western Europe and American Challenge: Conflict and Cooperation in Technological and Monetary Policy (1965-1973) », in *Journal of European Integration History*, n° 2, 2000



AGARD (1952→→): objectives of techno-scientific cooperation

*(Advisory Group for Aeronautical – poi Aerospace - Research and Development) in 1998 it merged with the Defense Research Group in NATO's Research and Technology Organization*

- The mission: **to bring together the highest personalities** in the aeronautical field of the NATO (1949) nations with a view to a better use of research and a more complete development of personnel and the **opening of opportunities** for the common defense of the Atlantic Community
- recommend **concrete ways** to employ research and development potential, provide advice on aerospace to the Standing Group, stimulate the search for new processes and solutions, improve cooperation and the exchange of information between its members, and guarantee them assistance and advice.



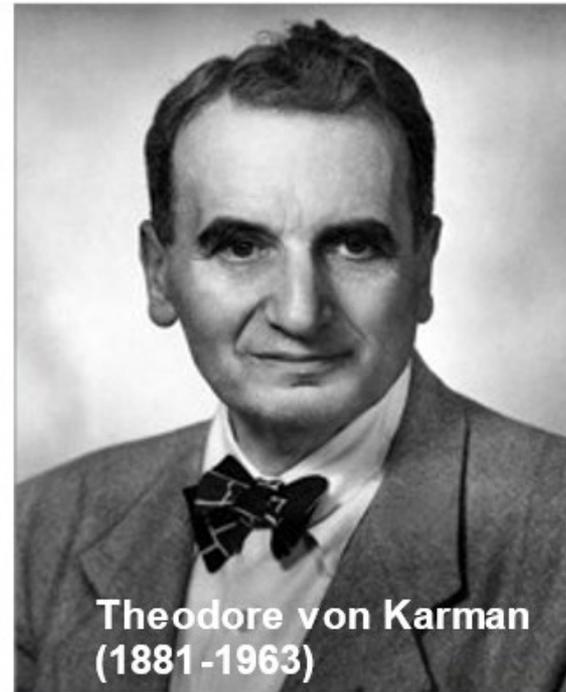
## **3. 1940s-1950s: American Hegemony... Why not?**

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In August 1944, in a car outside Fiorello La Guardia Airport, Theodore Von Karman met with the Commanding General of the Army Air Forces. “Hap” Arnold admits to him to be interested in the evolution of air warfare in five, ten or 65 years! He asks him to bring together a think tank around jet propulsion, atomic energy, rockets, and to go to Germany once liberated



**General Five Stars Hap Arnold (1886 -1950)**  
Air Force of Army



**Theodore von Karman**  
(1881-1963)



**Theodore von Karman, Dryden, Prandtl and Tsien**

This is how the Army Air Corps Scientific Advisory Group was born, later the Air Force Scientific Advisory Board, organized with Hugh L. Dryden, a physicist, head of the National Bureau of Standards Division of Mechanics and Sound, but above all a member of the NACA, and one of the future AGARD delegates. At the end of April 1945, Von Karman left for Europe in search of high technology.



1971, December: the end of Gold Standard

1972, 21-28 February Nixon's visit in China

1973, 6 October, Yom Kippur war

1975, April Paris agreements on Peace in Vietnam

1978-79, Camp David Accords

1979, 16 January-1<sup>st</sup> April Iranian Revolution

1979, 24 December Soviet invasion of Afghanistan

and Khomeini became supreme leader of Iran



**«their will to realize more and more deeply the activities of Community in order to **coordinate** and to push industrial research and development in the principal **high technologies** fields, particularly in **common programs**, and to supply financial tools for this **target**»** The Hague conference (EEC), 1969



- ***Common action to develop high technologies Industries***
- ***To finance research as a tool for development***
- ***To encourage the creation of European firms as big as the US ones***
- ***A European market of capitals for investments***

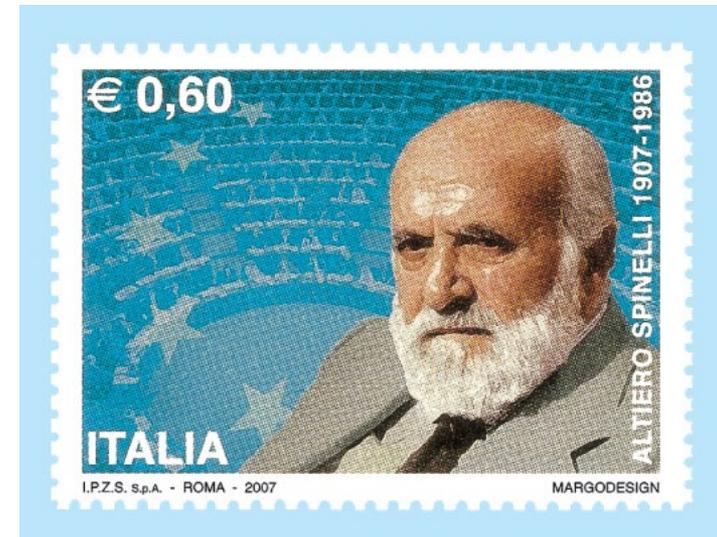
Memorandum *La politique industrielle de la Communauté* to Council (**March 1970**)  
by Commissar for Industry  
**Guido Colonna di Paliano**



In **May 1973**, a working group of the European Council met on aircraft industry and electronics with the European Commission representative **Christopher Layton**, the Chief of Cabinet of European Commissar for Industrial, Scientific and Technological affairs (July 1970-June 1976), **Altiero Spinelli**, the father of European Federalism

“Plan Schuman” for European Techno-industries or... a new “PAC” inspired by the Politique Agricole Commune

→ coordination of techno-industrial production by **existing consortia**



i.e. the Commission Action Plan, sent for examination to European Commission,  
**October 1975**

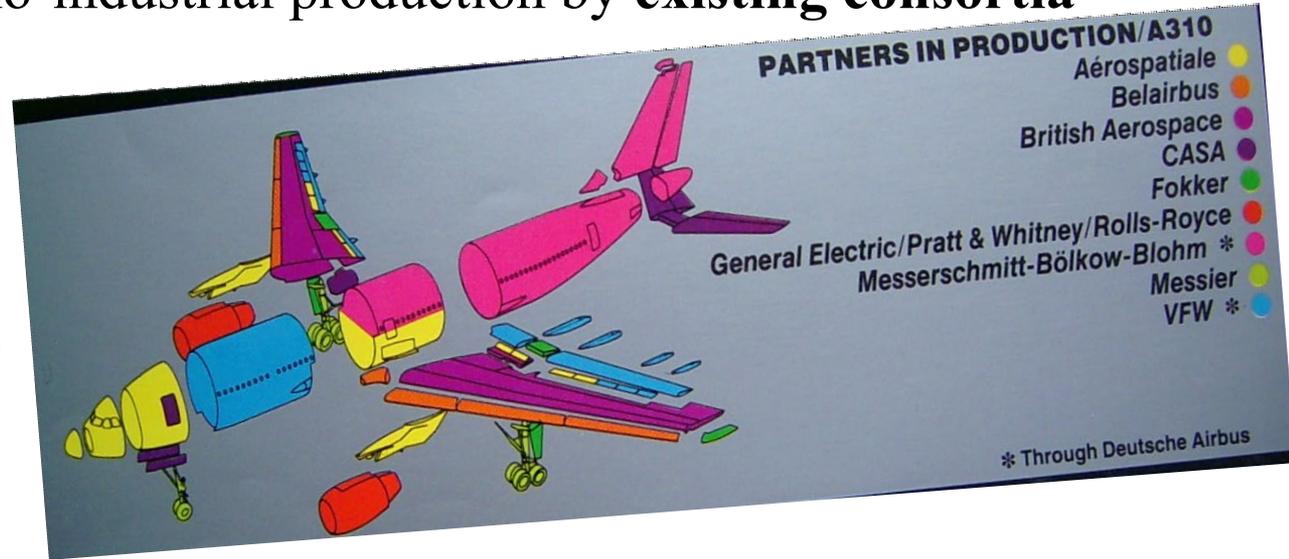


...coordination of techno-industrial production by **existing consortia**

**Politique et  
Recherche  
scientifique et  
technique (PREST)  
1971:**

**Informatics and  
telecommunication,**

transports, oceanography,  
metallurgy and pollution in air,  
water, noise, food traceability



**Scientific and  
Technical Research  
Committee (CREST)  
1974**



W. Treadgold of UK Department of Trade and Industry, in July 1973, about Tripartite group:

«*One thing on which the French and German Governments are agreed is that collaboration on aerospace is **essentially a matter for Governments** and the role of the **European Commission should be limited***», The National Archives, Kew Gardens, DTI

**German** representative in Tripartite Group, Engelmann et Schomerus remarked «the exploitation of the Commission document [the Action Plan for high technologies] would be a tactical ploy. Their general attitude that this was a **matter between Governments** rather than for the Commission had not changed». European Commission could be «a forum for discussion but little else of positive nature», because «they [European Commission] could well have a negative effect by setting up rigid procedures which would limit our freedom of action». *Akten zur Auswärtigen Politik der sBundesrepublik Deutschland*

Bernard Esambert, Adviser of President Pompidou for Industrial and Technical Affairs, speaking on Airbus said that this was not «**européen mais non communautaire**». Esambert in E. Chadeau, *Airbus*, 1996



→ March 23, **1983**: Reagan launches the **Strategic Defense Initiative (SDI)** or Stars War, a challenge to the USSR but also a split between the defense of the USA and the defense of Europe, and in fact the Europeans do not respond positively but together, because GB Italia and RFA negotiate with the USA while France proposes the Eureka project to relaunch European technology



The 863 program State High-Tech Development Plan = rendering China independent of financial obligations for foreign technologies ← SDI (1983)

a letter (3 March 1986) to Deng Xiaoping approved the program within 2 days by...

- **Chen Fangyun** (1916-2000), electrical engineer, founder of radio electronics in China, telemetry, tracking and command (TT&C) → satellites and missiles + GPS BeiDou

- **Wang Ganchang** (1907-1998) nuclear physicist, father of Chinese nuclear physics, cosmic rays and particle physics + detonation physics experiments, anti-electromagnetic pulse technology, nuclear explosion detection, anti-nuclear radiation technology, and laser stimulated nuclear explosion technologies

- **Wang Daheng** (1915-2011) optical physicist, engineer, the "father of optical engineering" in China

- the *Loongson* computer processor family
- the *Tianhe* supercomputers
- the *Shenzhou* spacecraft with 5% of the total government spending that year



- the European Commission proposal = an EEC Research Agency
- for France = a framework for organizing common projects but on an ... intergovernmental basis = outside the EEC

Eureka or the opportunity to see clearly...

On the meaning of European techno-scientific cooperation...

*No constraint, in this very light structure [Eureka], retains those who participate in it. Because they feel free, countries do not dream of returning to their isolation. Contrary to any bureaucratic constraint, this approach would benefit from being reproduced for the whole of European construction. Like Ariane [+USA ELDO ESRO] and Airbus, Eureka had reinforced the idea that Europe can be built within a framework of variable dimensions. Roland Dumas, Minister of Foreign Affairs of President François Mitterrand, Le Fil et la Pelote. Mémoires, Paris, Plon, 1996, p. 333.*



## **1989 JESSI Research Program (1989-96) on Microelectronics:**

- **Green books of Philips, Siemens, ST**
  - **Commission funds (FP) and by Member States (EUREKA)**
  - **JESSI**
    - **Technologie 43%**
    - **Applications 32%**
    - **Materials 19%**
    - **Base Research 6%**
- February 1986, Single Act, art. 130,  
FP Framework Programs:  
EEC has as target «**to reinforce the  
scientific and technological bases  
of European industry and to let  
the development of her  
international competitiveness**»...



**1957 SGS created by Olivetti, then SGS-Fairchild, Agrate Brianza**

**1959 ATES, agency of Marconi Italia, enter in STET, Catania**

**1972 fusion in SGS-ATES**

**1980 Pasquale Pistorio, from Motorola, reorganized**

**1987 fusion with Thomson Semiconducteur = SGS-Thomson,**

**then ST Microelectronics (n. 11 at global level)**

**1994 consolidated debt, entry in the bourse**

**2001-02 STM isat 4-5 ld**

**2022 n. 11 with gains of 16.13 B\$ vs 0.85 in 1987**



1) **Witnesses** → **HAEU (Historical Archives of European Union, Firenze)**  
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...and documents to become **Private Archives at HAEU**

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a) **Spring School**

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CNR, Rome, 25 May 2023, European Space Agency, ESRIN, Frascati (Rome), 26 May 2023  
University of Rome Three, 25-26 May 2023

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