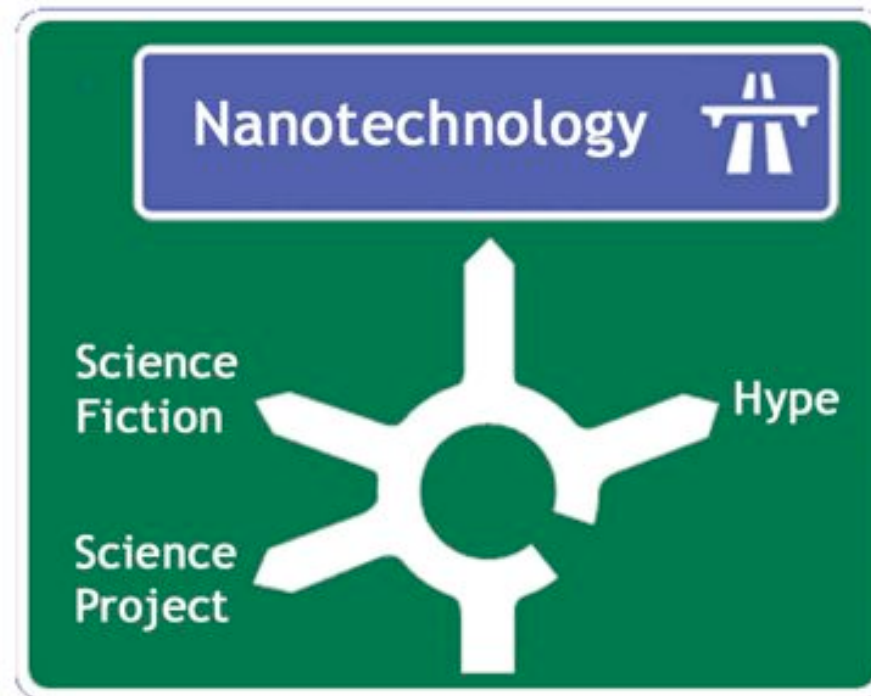


The Nanotech Economy



Tim Harper, Cientifica Ltd, London

- Cientifica is a world leader in providing consulting, as well as technical, scientific and industrial information on emerging technologies, with a specialization in nanotechnology;
- Cientifica combines a profound knowledge of science and business with an advanced data management system;
- Cientifica provides companies, governmental institutions and venture capitalists all over the world with accurate and critical business information.

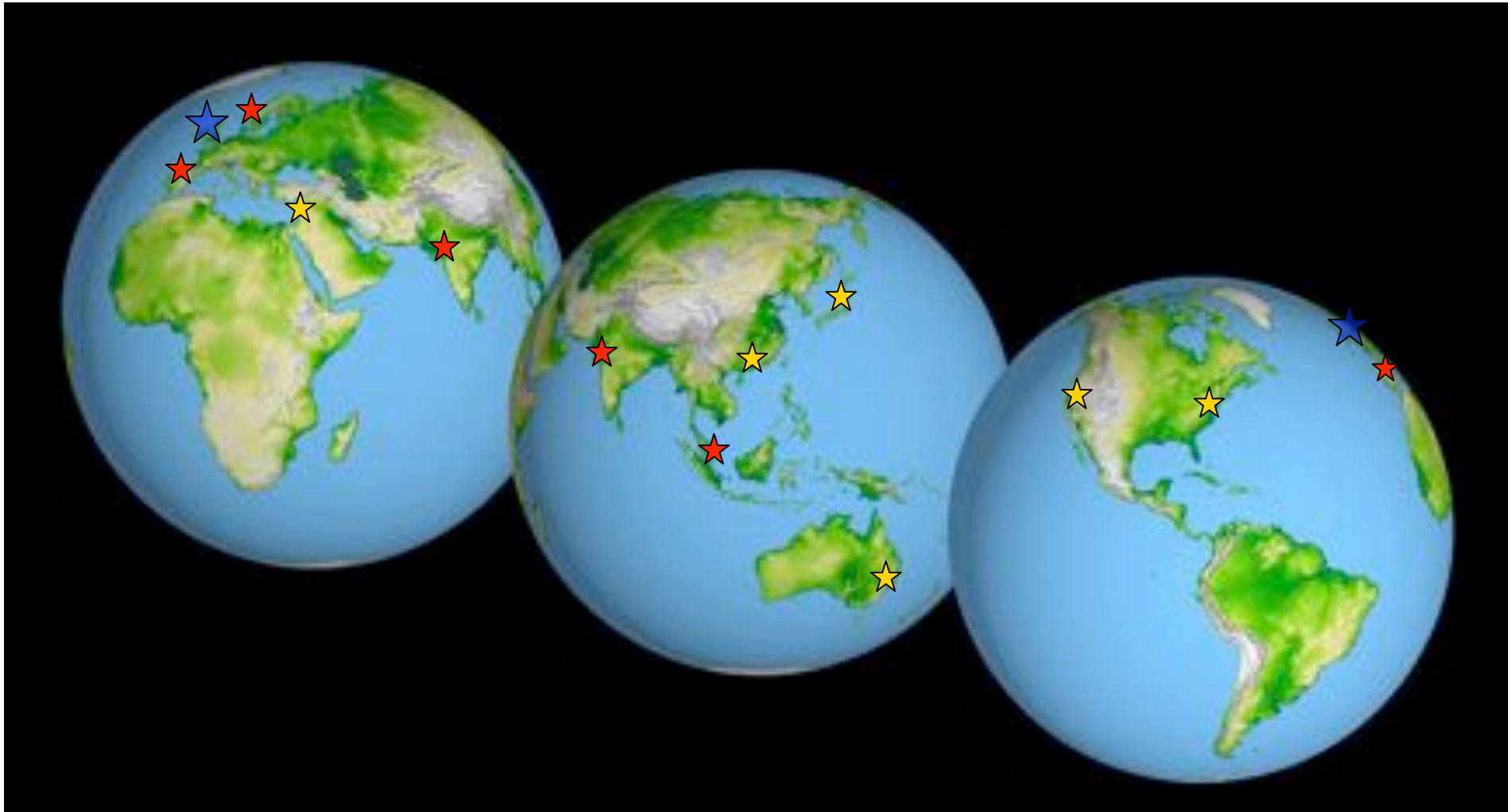
London based Cientifica Ltd

- Provides contract research and development outsourcing via facilities in India and Singapore;
- Provides global nanotechnology business intelligence and consulting services to industry and investors worldwide;
- Organises world class global events such as the World Nano-Economic Congress;
- Coordinates EU research programs from electronics to toxicology, regulation and legislation;
- Provides expert advice to governments and companies worldwide.

The Benefit of Understanding of the Science

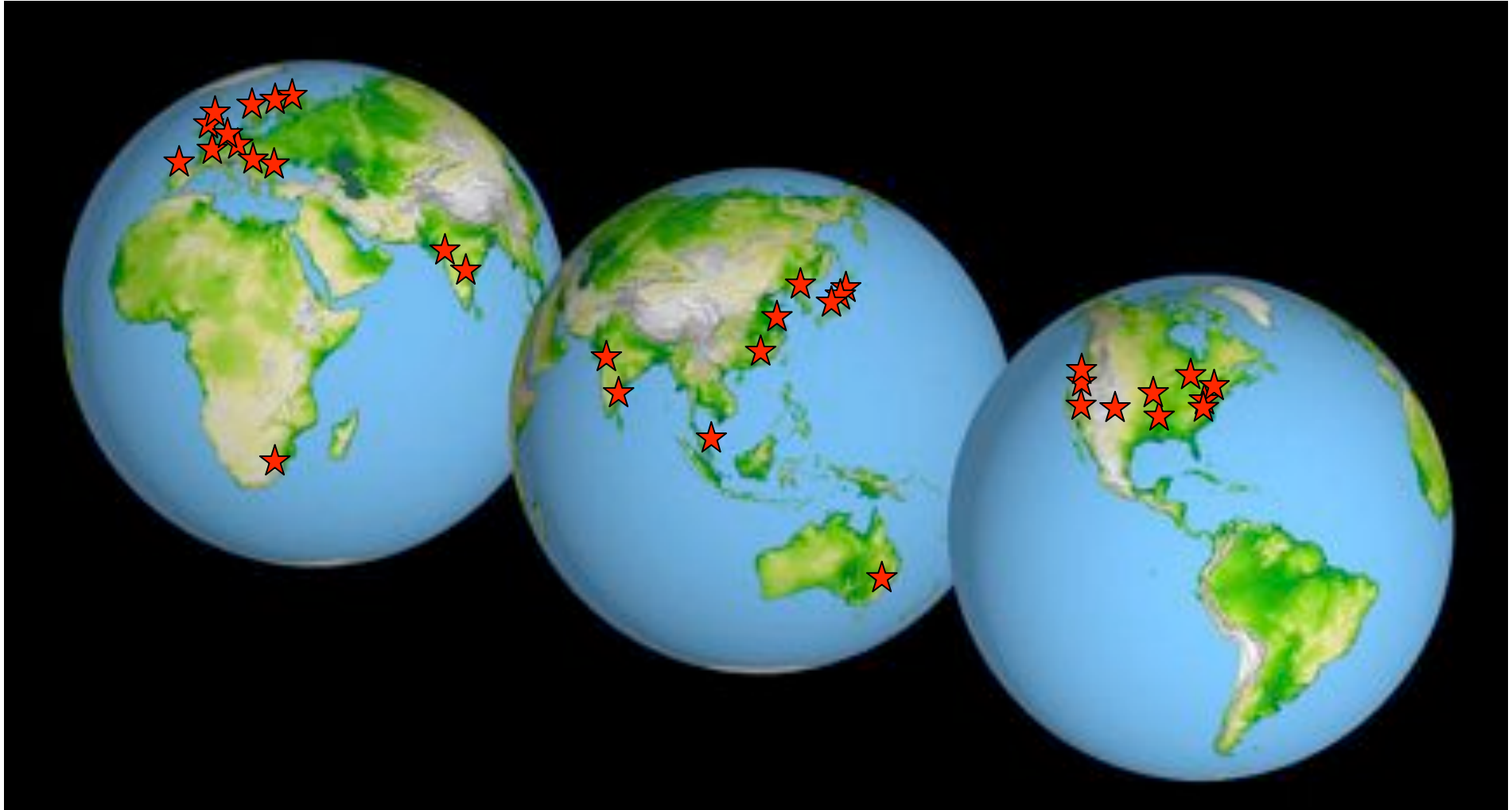


Think Globally...



★ Offices ★ Associates
★ Global Headquarters (London)

...Act Locally

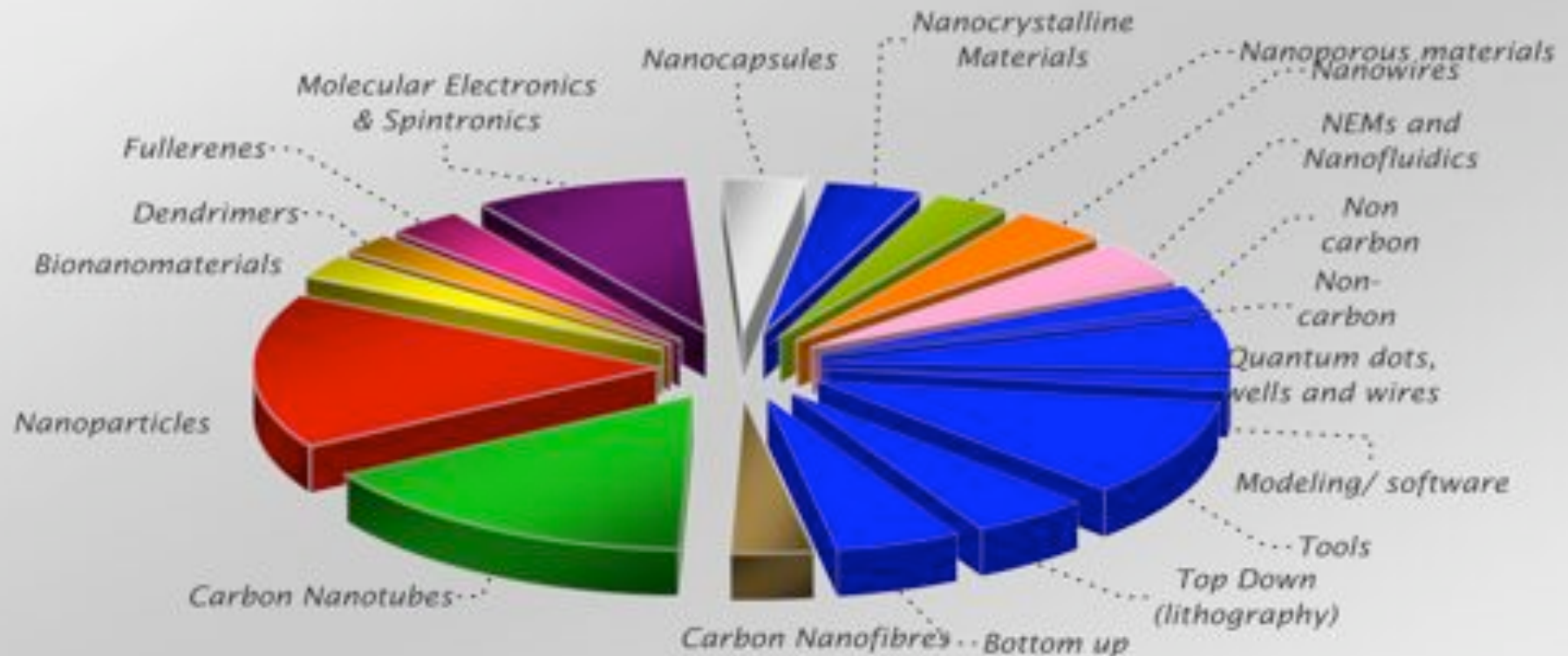


★ Cientifica Consulting Clients

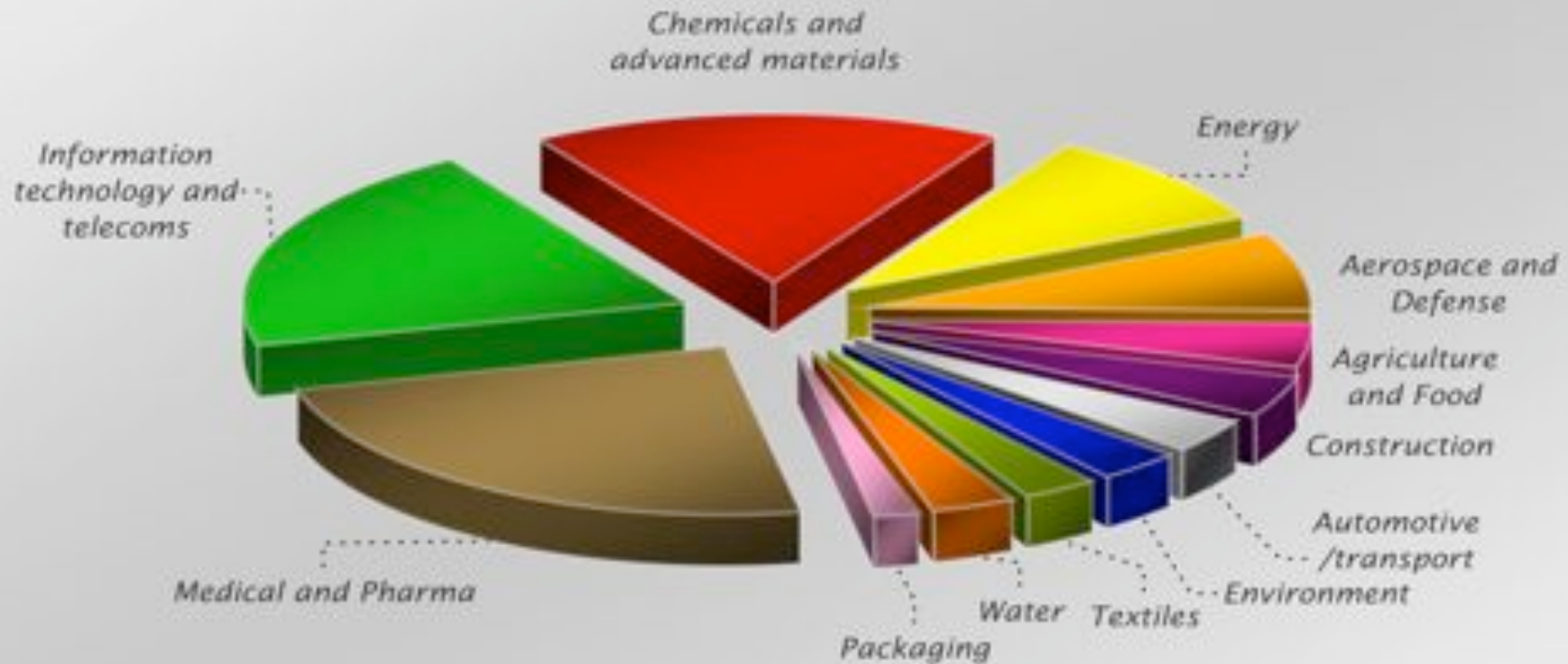
Nano Activity?



Nano Talk (Press Articles 2004-5)



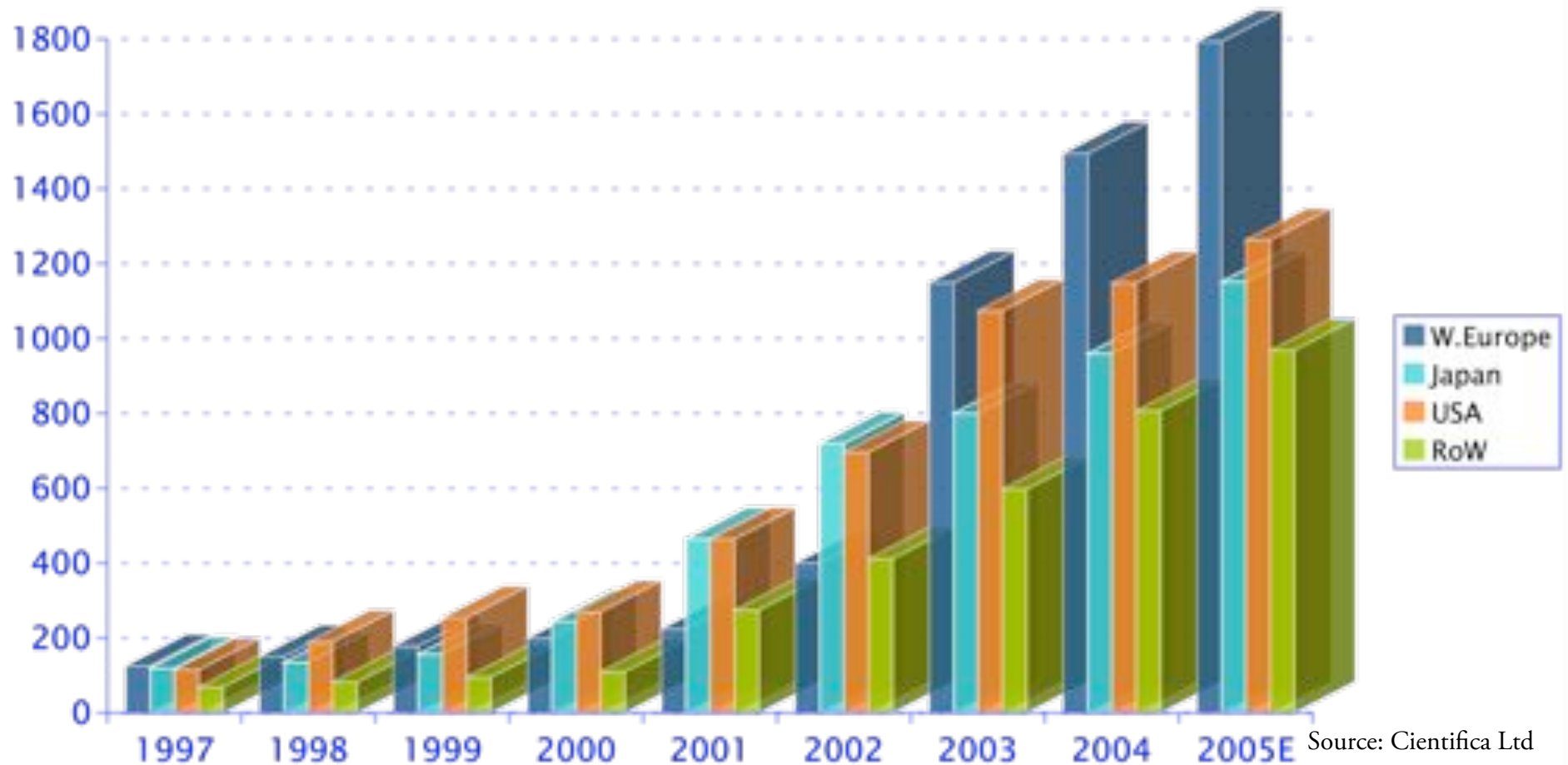
Number of Companies by Activity



Nano Numbers?

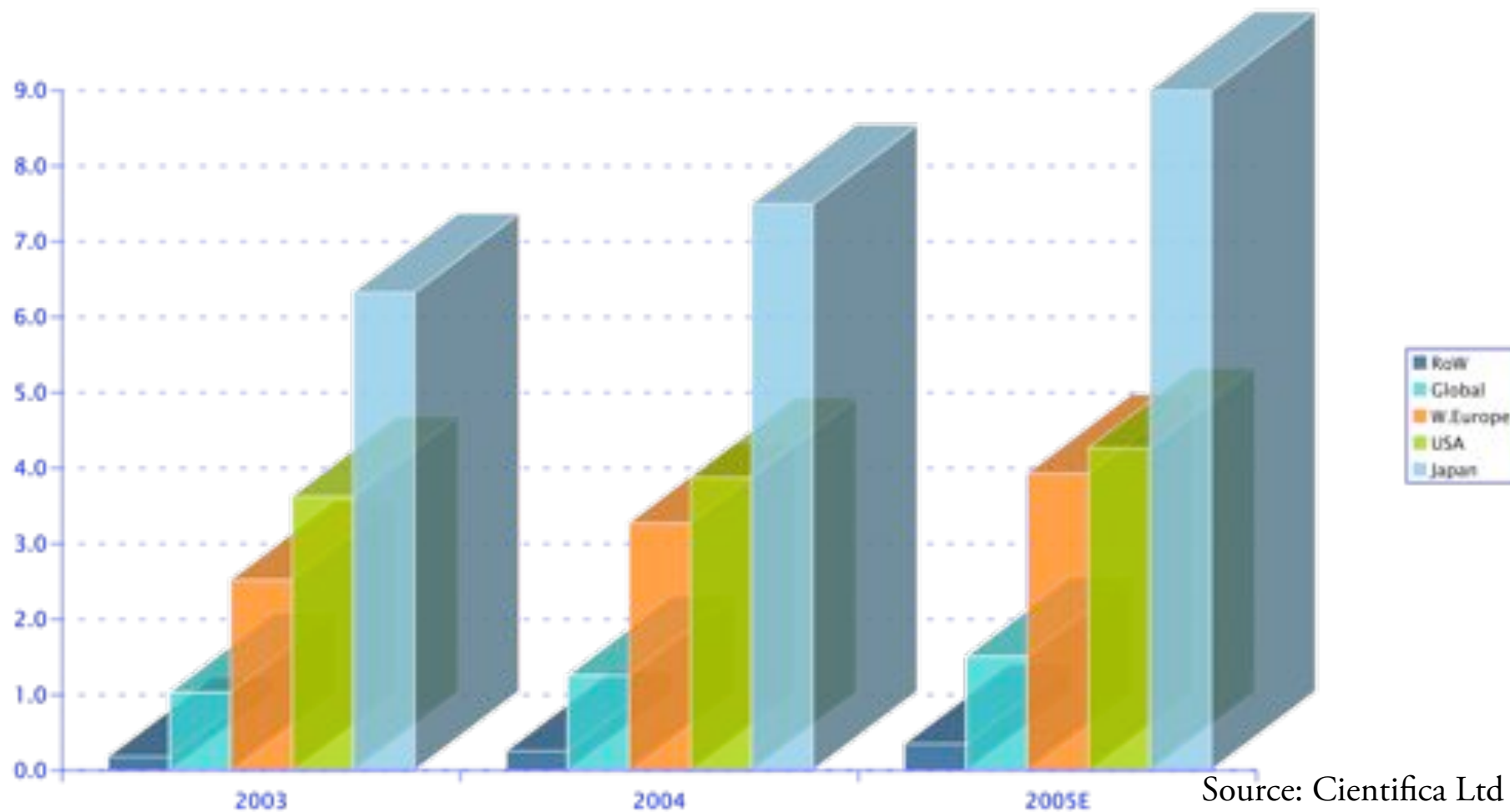


Government Funding of Nanotechnologies



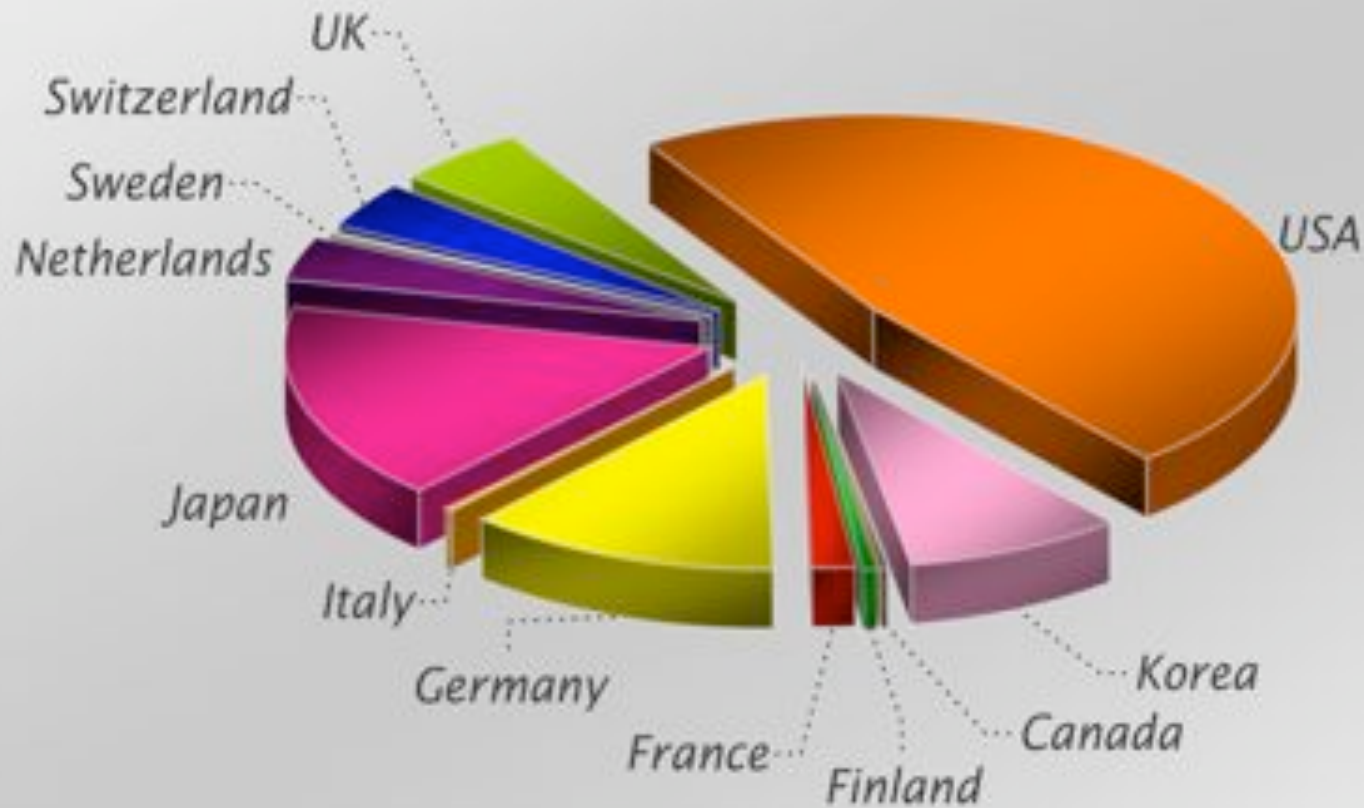
Source: Cientifica Ltd

Government spend per capita (US\$)

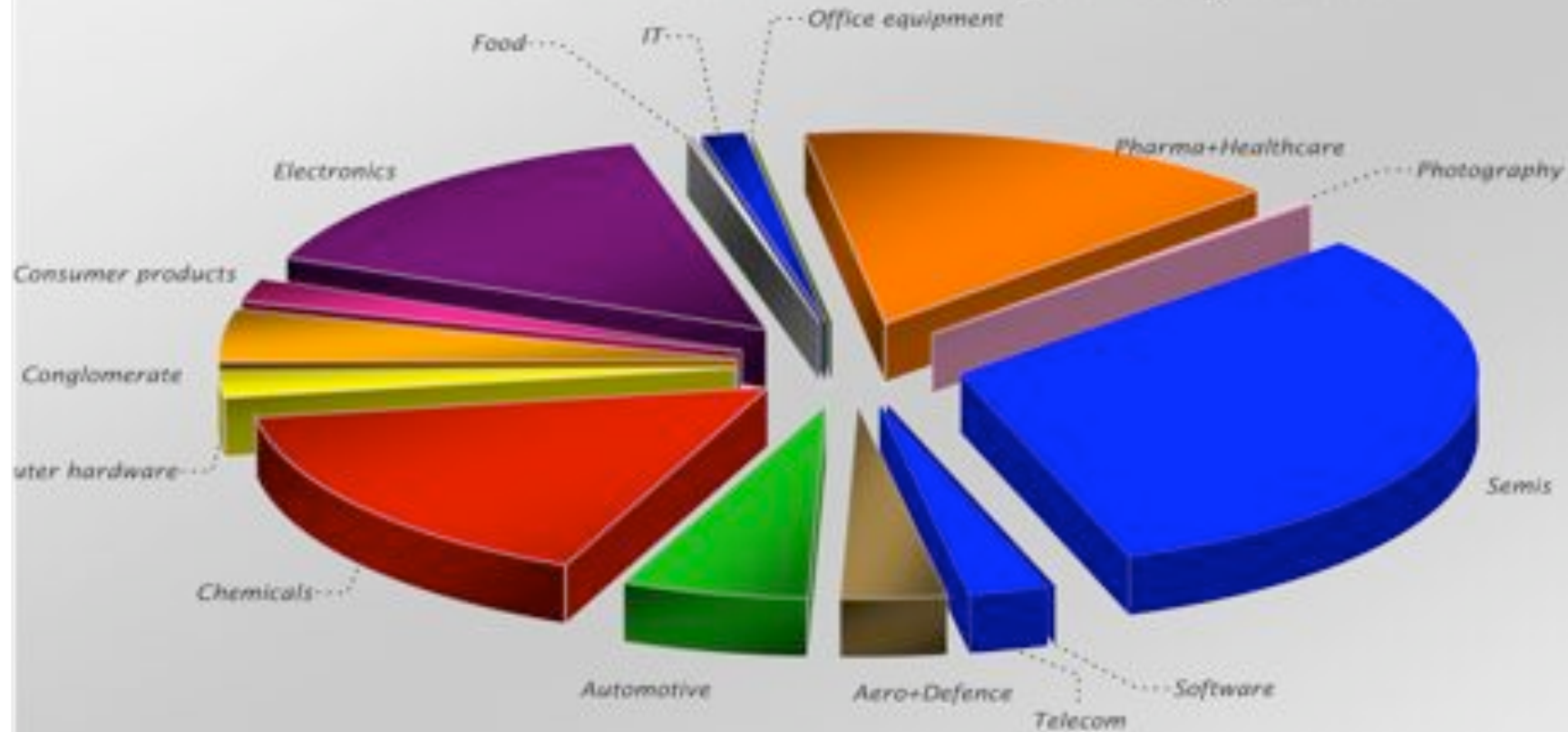


Source: Cientifica Ltd

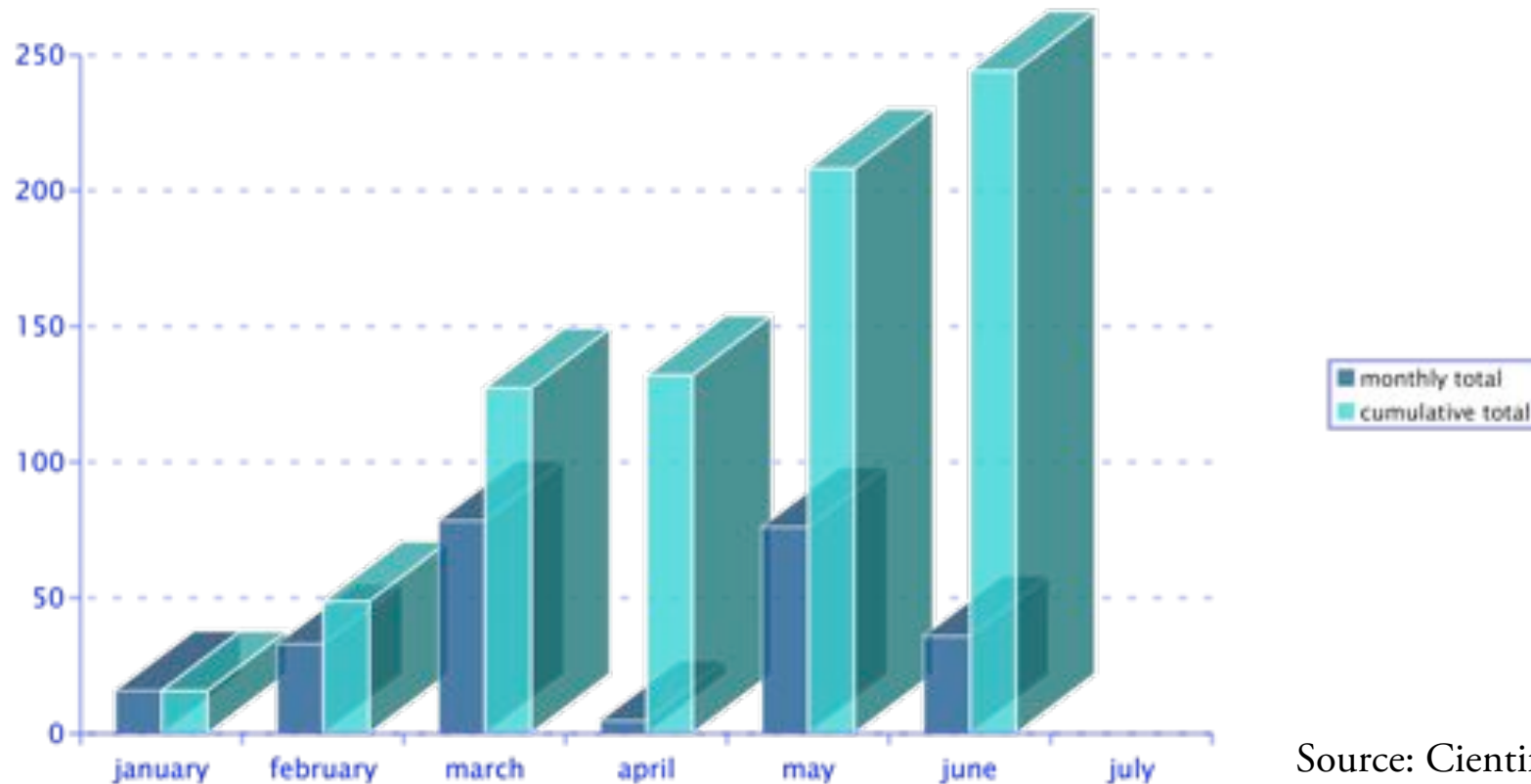
Private Nanotech Spend by Country 2005



Private Nanotech R&D Spend by Sector

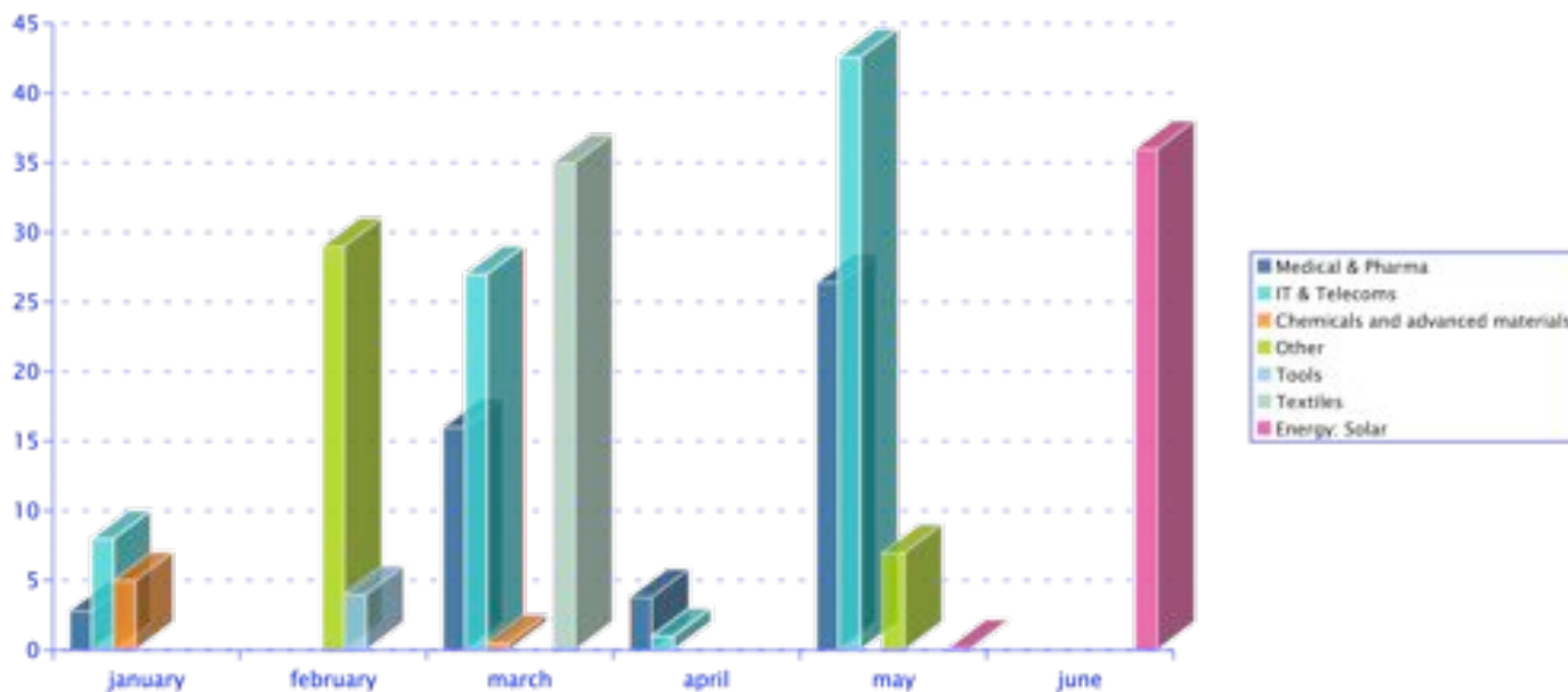


Venture Capital Deals 2005 - Viable Nanotech Companies?



Source: Cientifica Ltd

Venture Capital 2005 By Sector



Nano Products



Nano Products



RESISTS SPILLS

The waiter just spilled an iced latte in your lap, but you don't mind. You're wearing pants made with NANO-TEX™ spill-resistant fabric, so the coffee just beads up and rolls right off.

Now, this beats those conventional fabric treatments we've all seen before. That's because Nano-Tex builds spill resistance into the very fibers of the fabric, and this keeps the pants comfortable, soft, and breathable—just as they should be.

With NANO-TEX Fabric, you're looking good and feeling good. Complications roll away like water off a duck's back, and you're ready for whatever's next.





LIQUIDS ROLL OFF

CHARACTERISTICS

- SPILL RESISTANCE**
allows spills to wipe off easily
- DURABILITY**
maximizes performance over time
- COMFORT**
retains natural softness for maximum comfort
- BREATHABILITY**
allows fabric to breathe naturally

WHERE TO BUY

- Apparel
- Interior Furnishings
- Uniforms

FAQS

- Read FAQs**
Learn more about Nano-Tex™ Resists Spills Fabric

DOWNLOAD

- Product Info**
Learn more about Nano-Tex™ Resists Spills Fabric (.pdf)

OTHER NANO-TEX FABRICS 

 COOLEST COMFORT

 RESISTS STATIC

 REPELS & RELEASES STAINS

Nano Products



Shanghai BEST Industry
& Commerce Co, China

Nano Products



Shantou Tongsheng Co., Ltd,
China

Nano Products



Hantra Corporation, Korea

Nano Products



Tropical Products Ltd
Thailand

Samsung Goes Nano



Samsung Goes Nano

Silver Nano's Sterilizing Mechanism

Silver Nano Ag⁺ sub-microscopic particles (1-100nm) that come into contact with bacteria or fungi can easily penetrate cells and suppress their respiration. This, in turn, adversely affects their cellular metabolism and inhibits cell growth.

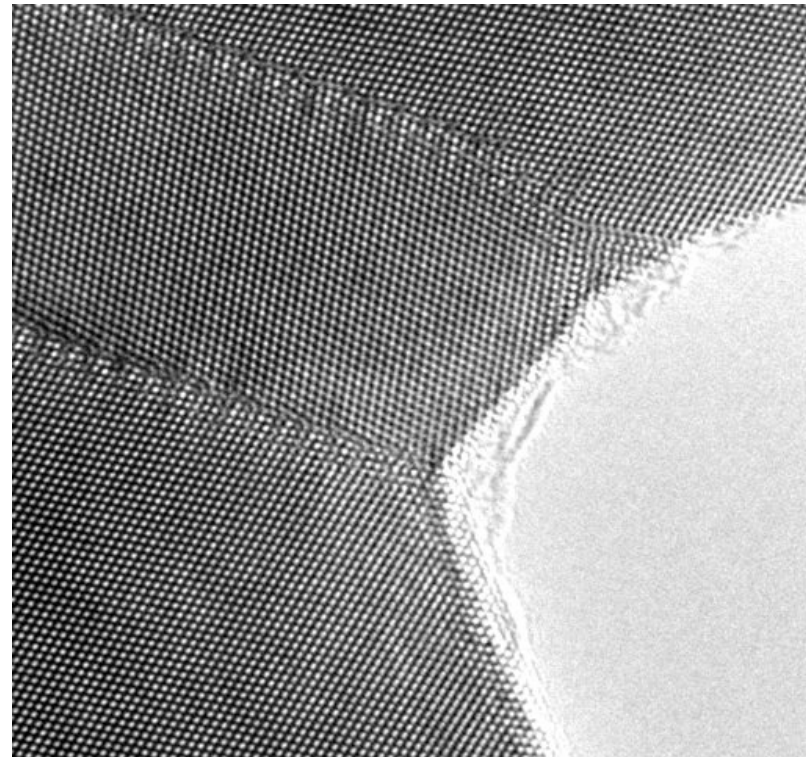


The Most Crucial Product - Tools!

- Without the ability to measure and manipulate nanotech would not exist
- Tools will help nanotech into the market

AND

- Allow product manufacturers to maintain yields and quality



Gold grain boundary sample and image
courtesy FEI

Characteristics of Current Nano Products

- ‘nano’ adds value by adding a nanomaterial to an existing product
- Amount and value of the ‘nano’ is nano
 - No new products visible
 - No new markets created
 - Nobody has been disrupted
 - Despite wild predictions of a ‘nano revolution’
- Why?

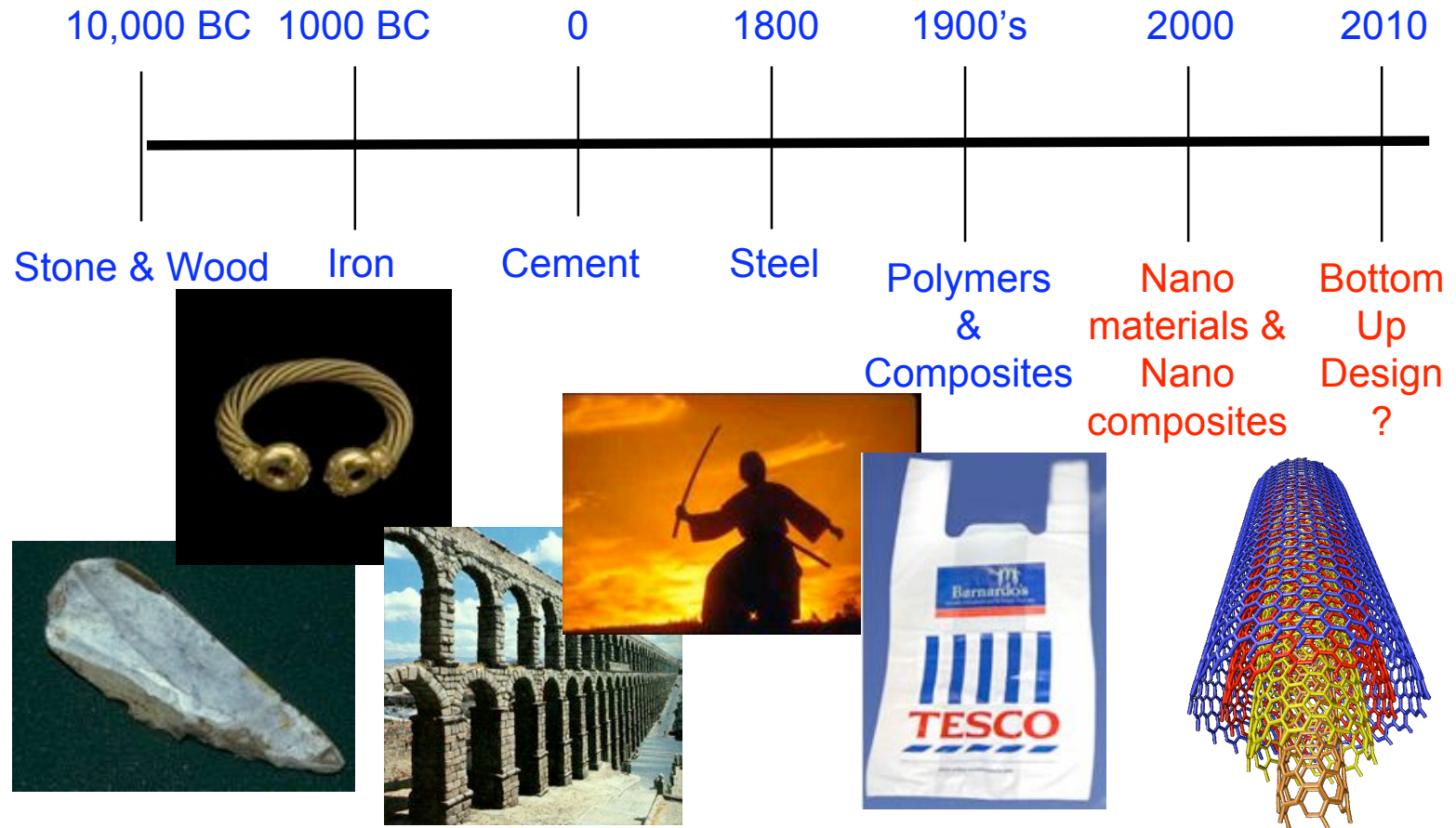
Business Information and Consulting

London . Oslo . Singapore . Mumbai

**cientifica**



The Evolution of Materials



Adapted from Herrmann, W. Chem. Eng. Technol. 21(7), 549 (1998)

Knowledge Based Applications

- What do nanotechnologies allow us to do that is new?
- Can we apply them to existing processes?
- Can we generate new paradigms?
- Look for the FedEx not the Webvan!

Nano Markets?

- Why have we not seen an ‘nanotech revolution?’
- Why will nanotech companies worth over \$100 million close down this year?
- How far is it to the trillion dollar market?

Taking Advantage of Nanotech

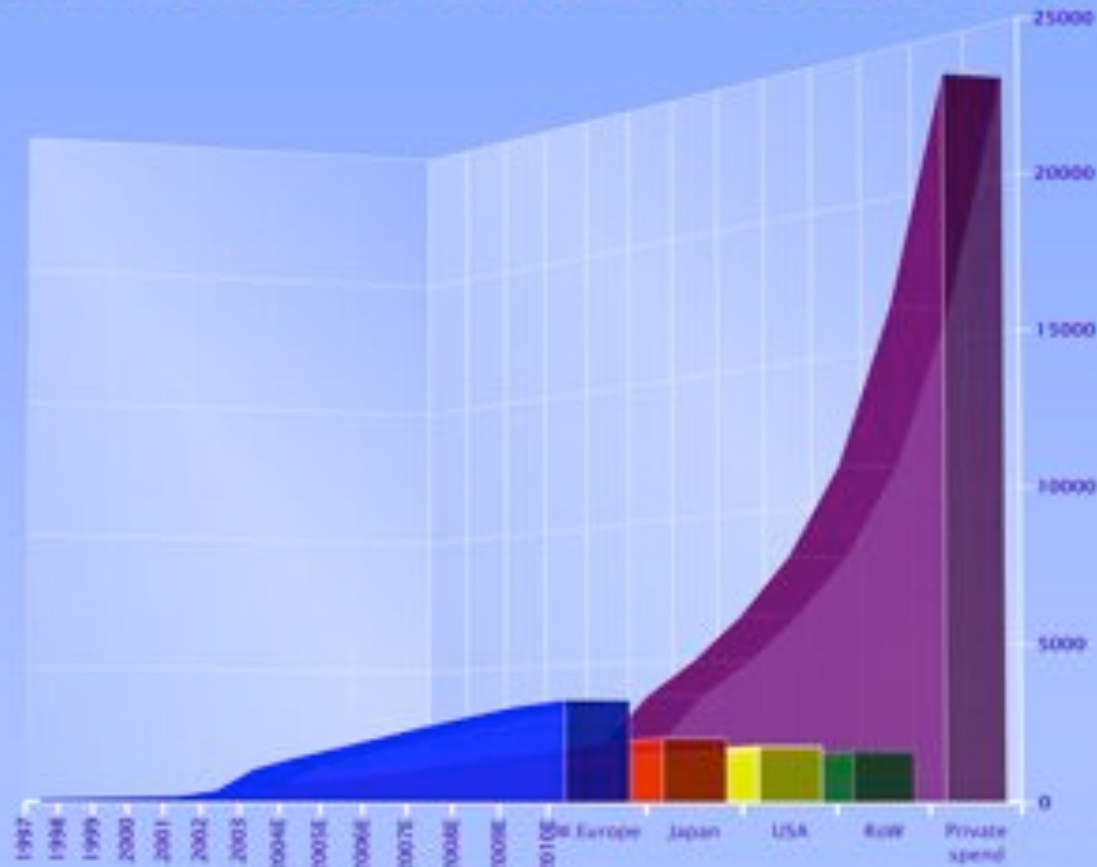
- Any product or process can be nano-enhanced
- Adoption however will depend on :
 - Price competitiveness
 - Performance improvements
 - Stability, consistency and quality of supply
 - Compatibility with existing industrial processes
 - Sufficient regulatory cover-HSE
- Industry is technology agnostic
- Many existing technologies are already highly advanced
- Nanotech has many hurdles to surmount

Is the factored impact on the economy more or less than other technology?

- In many cases, nanotech IS other technology, or is a bolt-on to existing tech
- c3500 BC invention of the wheel in Mesopotamia
- 1844 Goodyear invents vulcanized rubber
- 1887 Dunlop invents pneumatic tyre
- 1904 India Rubber add carbon black for reinforcement
- 1946 Michelin invents steel radial
- >2010 Carbon nanotube incorporation...?

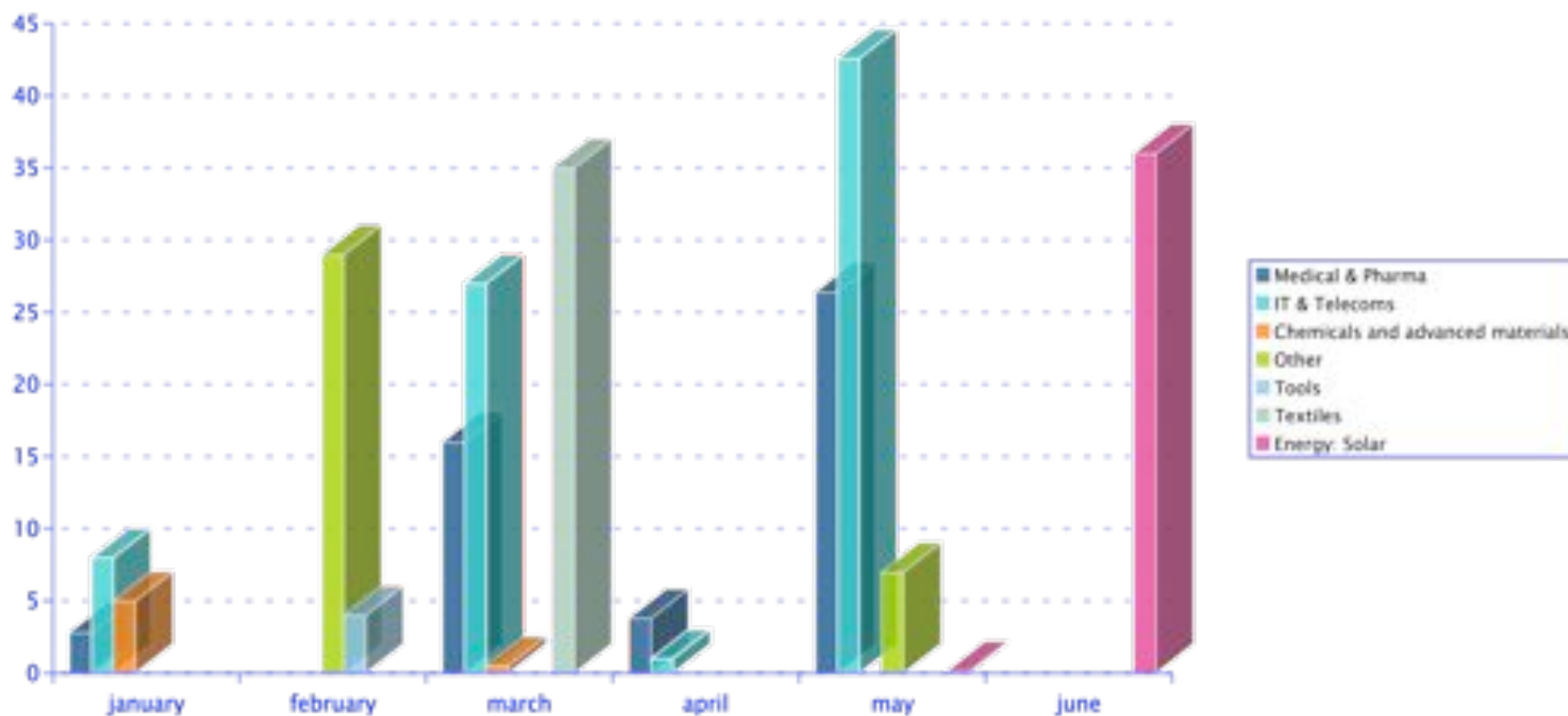


Total Nanotech R&D Spend (US\$ million) - The Private Sector Takes Over From 2005



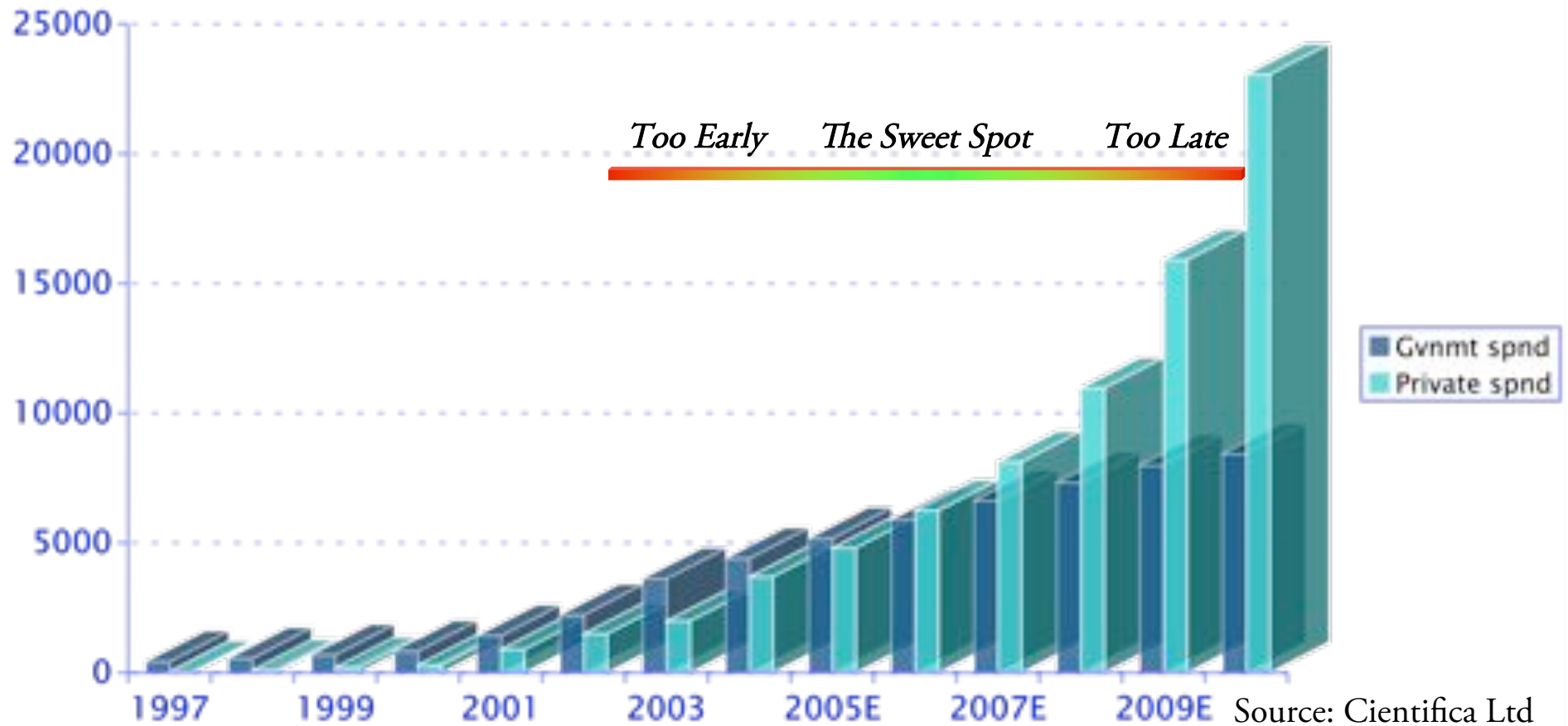
Source: Cientifica Ltd

Venture Capital 2005 By Sector

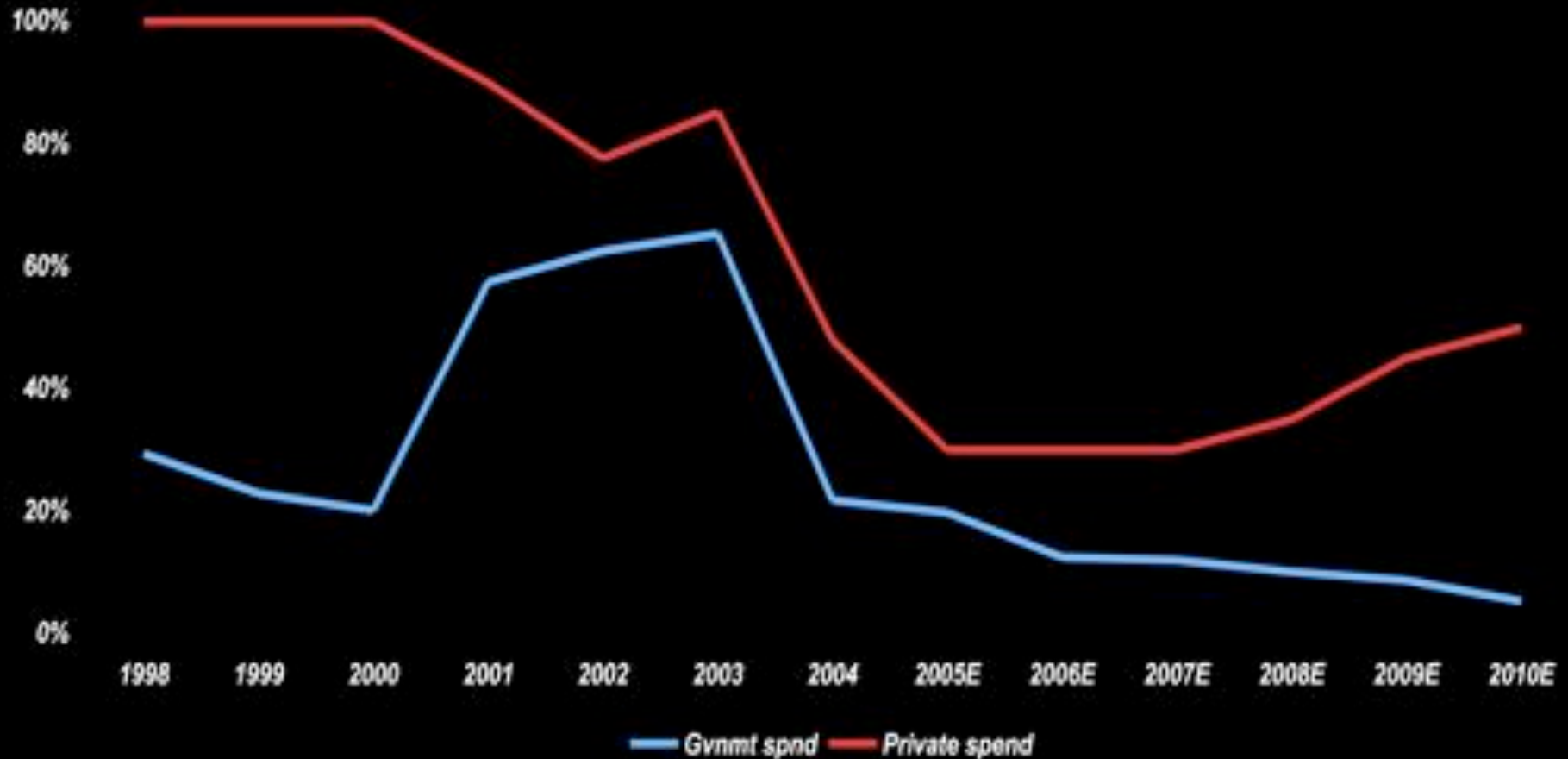


Source: Cientifica Ltd

Getting The Timing Right



Funding Year on Year Change



The Pioneers Get the Arrows...

- Many 'nano' companies funded in 2000-2003 were;
 - Science projects rather than product development
 - Funded by VCs looking for the next wave
 - Unaware of their markets and the barriers to entry
- As a result, some of them are having to raise more money at reduced valuations, holding fire sales or closing down

An Example: Optiva

- Raised \$41.5m in venture capital for flat panel display polarizers
- Attempted to break into a market 85% controlled by two Japanese companies
- Technological problems delayed the initial product
- The market found other solutions and moved on
- Assets sold for \$2m to Nitto Denka



From Scattergun to Strategy

- Many economies have ‘nanotech’ funding programs but...
- There will never be a ‘nanotech industry’ so...
- Most of the funding goes on curiosity driven academic research or has no long term economic effect

Creating an Economic Effect

- Where does Japan want to be in 10 years time?
- Specify objectives and competitive threats
- How can nanotech help us?
- Focus funding where it will help meet the strategic and economic goals

Conclusion

- Nanoscience is becoming nanotechnology
- Talk is about CNTs, but real action is in medical and pharma applications
- Products we are seeing now are just the tip of the iceberg
- Now is the time to start taking a serious look at the *applications* of nanotechnologies
- Japan can take advantage by getting smarter

Tim Harper - Cientifica Ltd.
London - Mumbai - Singapore
www.cientifica.com

Business Information and Consulting
London . Oslo . Singapore . Mumbai


cientifica