



The Space Economy and Space Innovation in 2016

United Nations / United Arab Emirates

High Level Forum: Space as a driver for socio-economic
sustainable development - Dubai, 21 November 2016



The Organisation for Economic Co-operation and Development (OECD)

The OECD is an **international economic organisation**

- **A global forum** in which governments representatives work together to address the economic, social and environmental challenges of interdependence and globalisation
- **A source of economic statistics** - provider of comparative data, analysis and forecasts to underpin multilateral co-operation (www.oecd.org)



OECD Space Forum – Fast facts

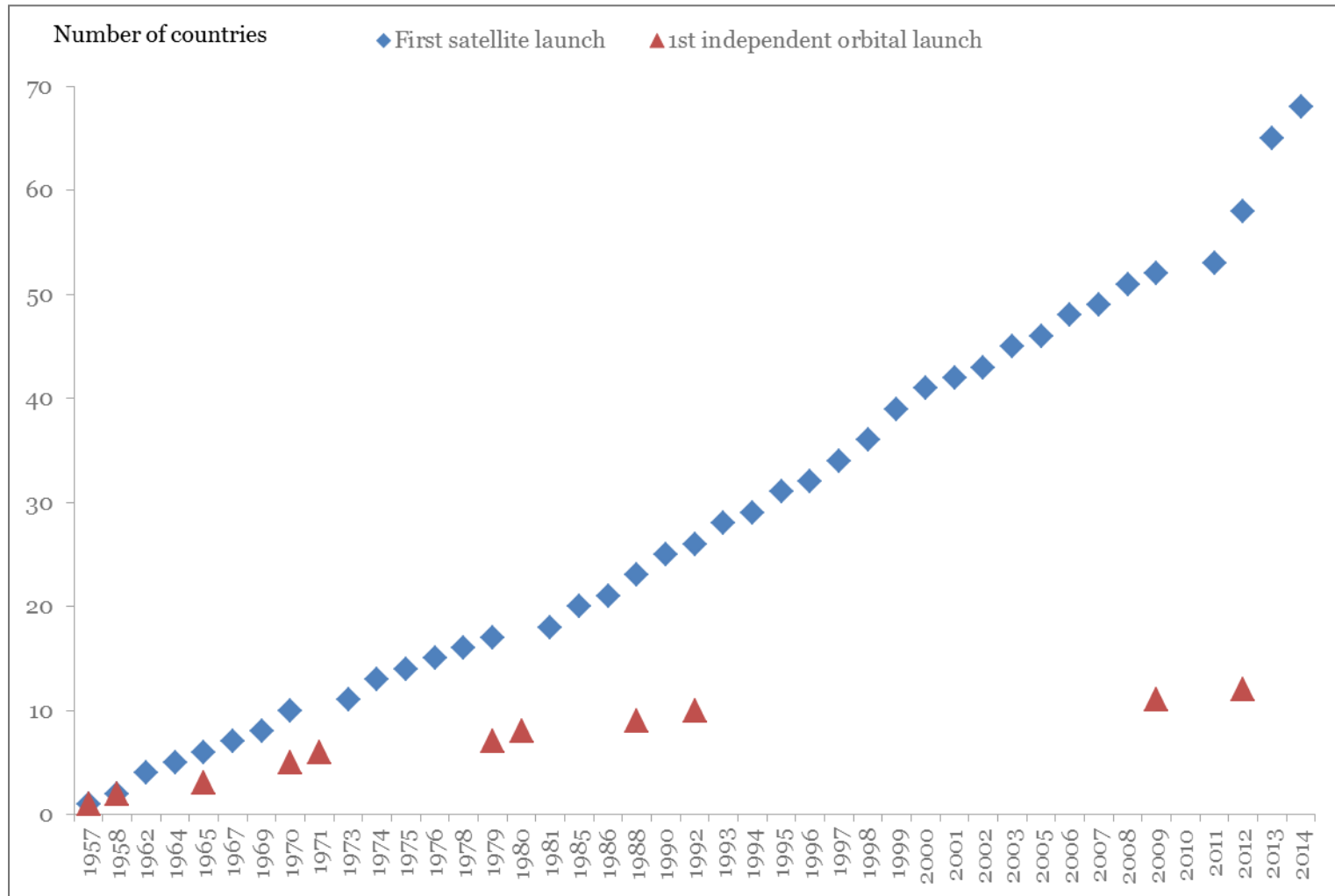
- ❑ **OECD Space Forum mandate** is to better identify statistically the space sector, and investigate its economic dimensions and innovation role for the wider economy
- ❑ **The Forum has become an international hub for experts / economists** : space agencies, ministries, international institutions, academia, private sector and industry associations
- ❑ **Steering Group Members**: 10 organisations in Oct 2016 - agencies from CAN, DEU, FRA, ITA, KOR, MEX, NOR, UK, US + ESA





Almost 70 countries with satellites in orbit...

Number of countries with satellites (launched independently or via a third party)



Source: OECD, 2015.



The Space Economy

GLOBAL

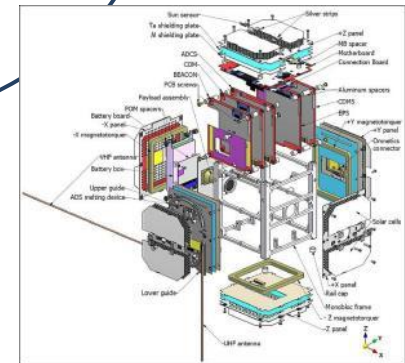
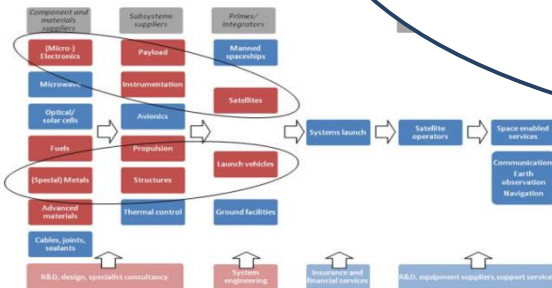
- + 65 countries with sats
- + 70 administrations with ongoing satellite plans
- + 50% of environmental missions are international...

VALUE

- Space economy represented more than USD 270 billion in revenues in 2015 (est.)
- Upstream vs. downstream

CHAINS

- More diverse actors
- More joining instead of building a value chain from scratch
- Learning in a global setting and moving up the value chain... competition





The importance of innovation

New report: (launched 27th October):

1. Analyses innovation dynamics that may be transforming the space sector (with a forward look)
2. Examines what types of innovations are derived from space investments



- Chapter 1. New trends in space innovation
- Chapter 2. Mapping space innovation
- Chapter 3. Institutions and policies conducive to space innovation
- Chapter 4. Making space innovation matter: Applications for societal benefits

Source: OECD (2016), *Space and Innovation*, <http://dx.doi.org/10.1787/9789264264014-en>

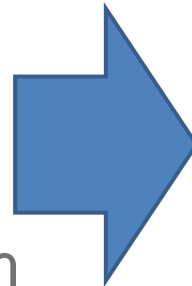


Drivers of innovation in the space sector

Three overarching thrusts

driving innovation in the sector:

- the persistence of national security and science objectives (with ever-more countries investing in space programmes),
- the expansion of downstream space applications (user requirements),
- and the pursuit of human space exploration.



- ✓ Governments remain key performers and customers of innovation in the space sector

(role of public research institutes in fundamental research and R&D)



Drivers of innovation in the space sector

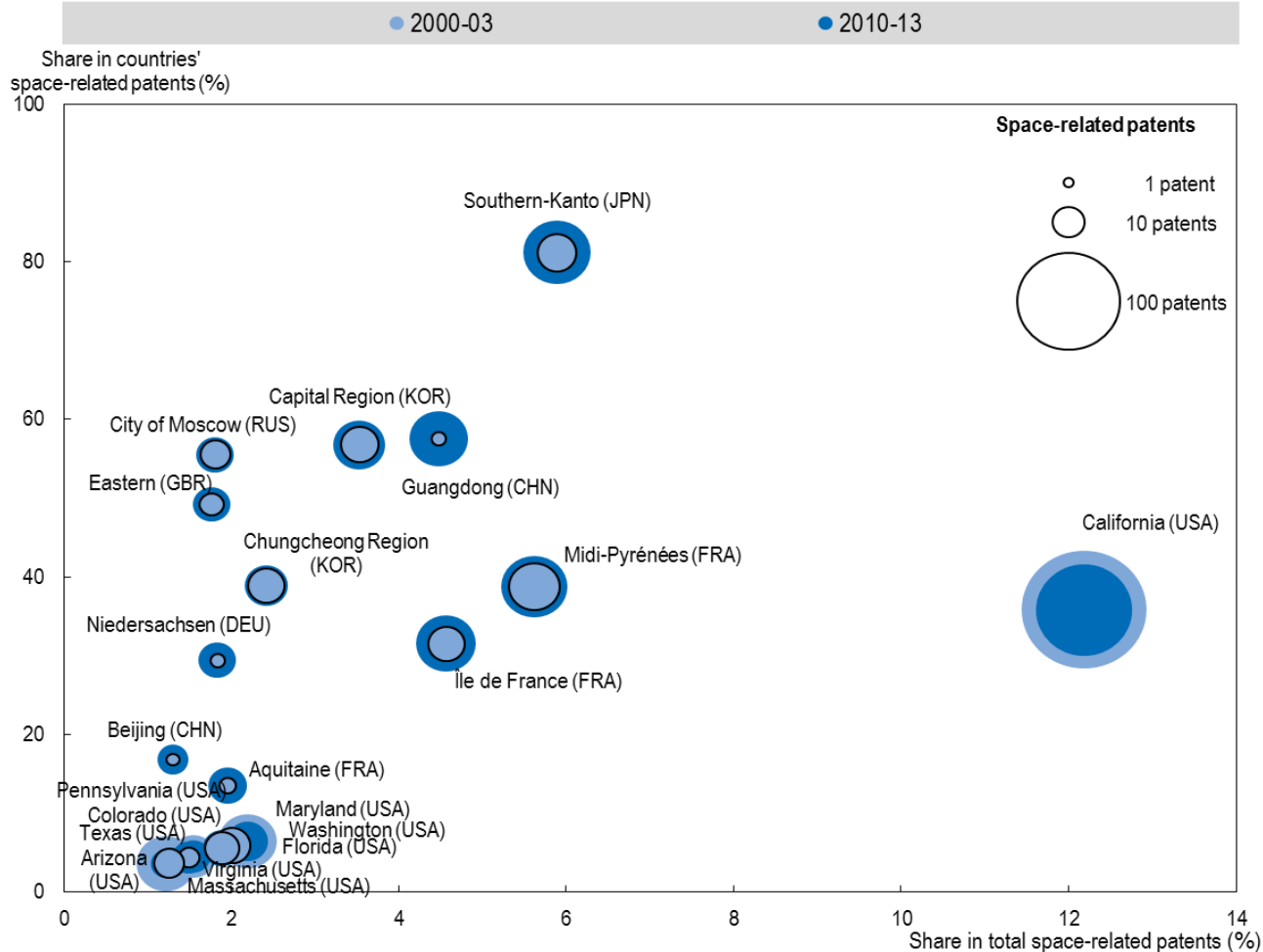
PARADIGM CHANGE...

- ✓ Internationalisation of segments of value chains
- ✓ New commercial actors from the Internet economy disturbing incumbents (« creative destruction »)
- ✓ New technologies and processes (lean management, robotisation, AI, miniaturisation...)
- ✓ Innovative uses of satellite links and data detached from traditional space sector, with needs to adapt to new requirements (real time...)



Mapping space innovation

Top 20 regions in space-related patents



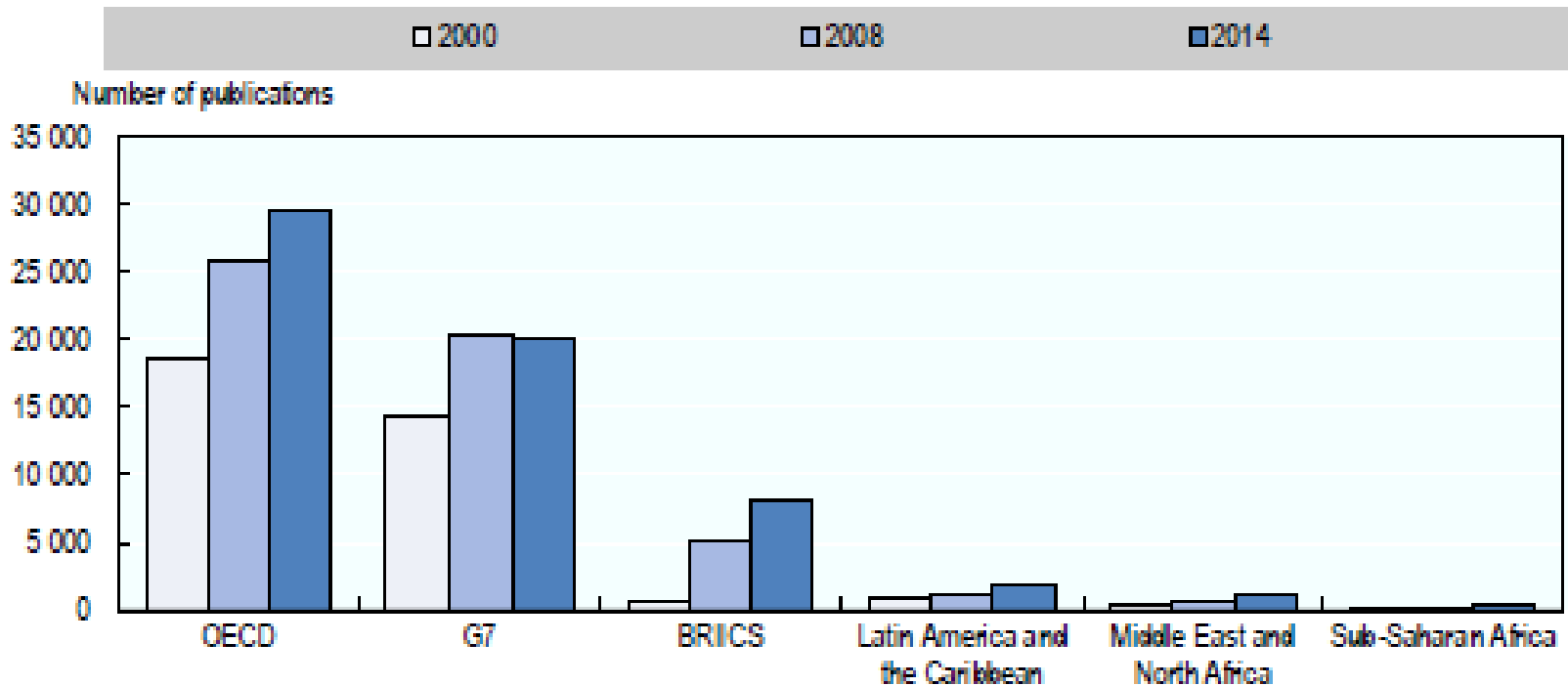
Source: OECD (2016), *Space and Innovation*, <http://dx.doi.org/10.1787/9789264264014-en>



Mapping space innovation

Scientific production in space literature, per region

Number of publications



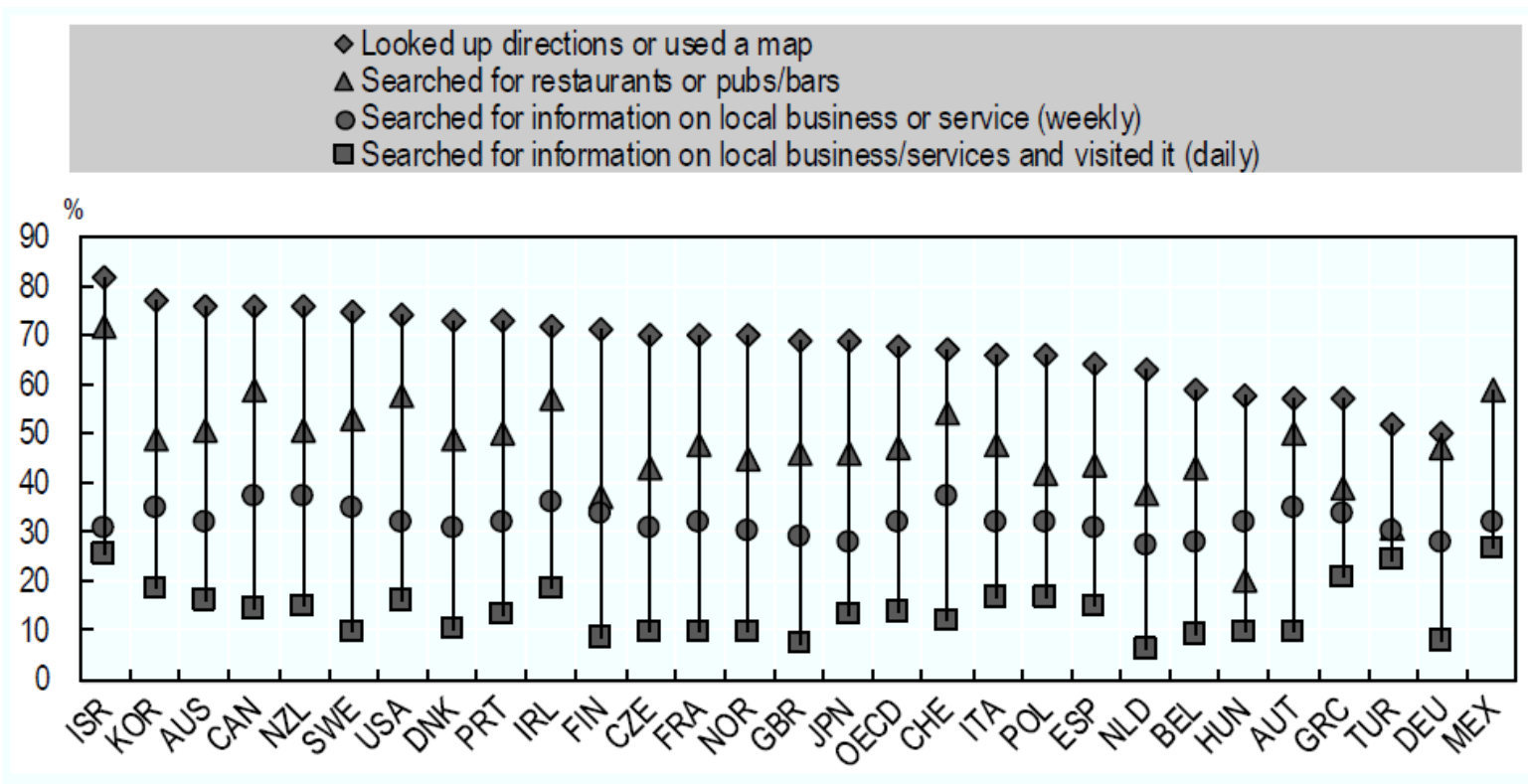
OECD analysis based on Scopus Custom Data, Elsevier, Version 4.2015 and SCImago Journal Rank (SJR) list of journals by subject, April 2016.

Source: OECD (2016), *Space and Innovation*, <http://dx.doi.org/10.1787/9789264264014-en>



Timing, positioning and navigation applications on the rise

Use of location-based services on smartphones



Source: OECD (2016), *Space and Innovation*, <http://dx.doi.org/10.1787/9789264264014-en>



The right conditions for innovation...

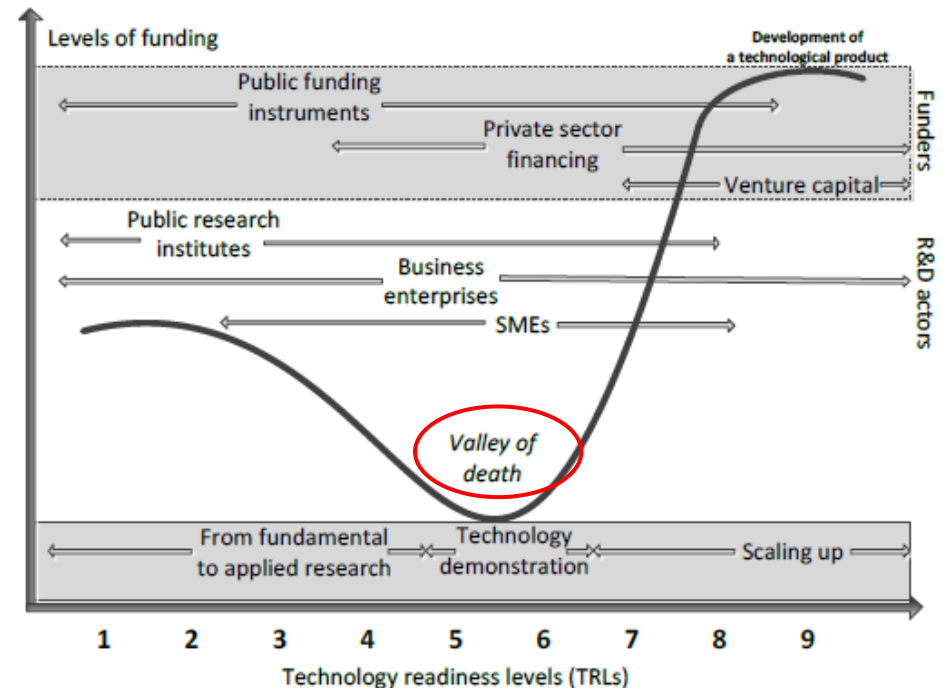
- An efficient **system for knowledge creation and diffusion** (from fundamental knowledge to technology transfer to other sectors);
- A **business environment** that encourages investment in technology and in knowledge-based capital (allowing experiment with new ideas, technologies and business models);
- A skilled **workforce**;
- **Policies** that encourage innovation and entrepreneurial activity (i.e. with clear instruments, grants, procurement mechanisms)



... with specificities of space programmes

- Specific innovation processes and market dynamics along the value chain
- Strong differences between economies in the way they are developing their space activities (from research to downstream) with a role (or not) for industry

Simplified overview of technology readiness levels with funding and R&D actors





Three policy advices for administrations in mapping their space economy

- 1. The national value chains need to be thoroughly mapped and monitored – who does what?**
 - Make better use of the wealth of existing administrative data (tax and registry codes, contracts, trade data...)
 - Conduct regular surveys (industry, higher education, admin.)
- 2. Review and evaluate national policy instruments that support space innovation,** with particular attention to examining the networks of knowledge diffusion, such as clusters and incubators, to ensure complementarity at regional and national levels.
- 3. Sustain value-creating industries**
 - Understand and support the role played by national research institutions in fundamental R&D for space activities
 - Strengthen innovation policies for international competitiveness (e.g. entrepreneurship, IP regime for agencies)



Thank you
for your attention.

<https://www.innovationpolicyplatform.org/oecd-space-forum>