

Innovation in India

AVRIST 01/20/2021

Space Research and Space Industries

Round table

coordinated by Pierre-Bruno Ruffini

India, a unique player of the « Space Club »

Isabelle Sourbès Verger, CNRS

Space as a part of Science, Technology and Innovation Policy (STIP)

- Space has been an integral part of India's S&T policy since the 1960s
- From this point of view, India is a well known member of the so called “space Club”



1983 Aryabata

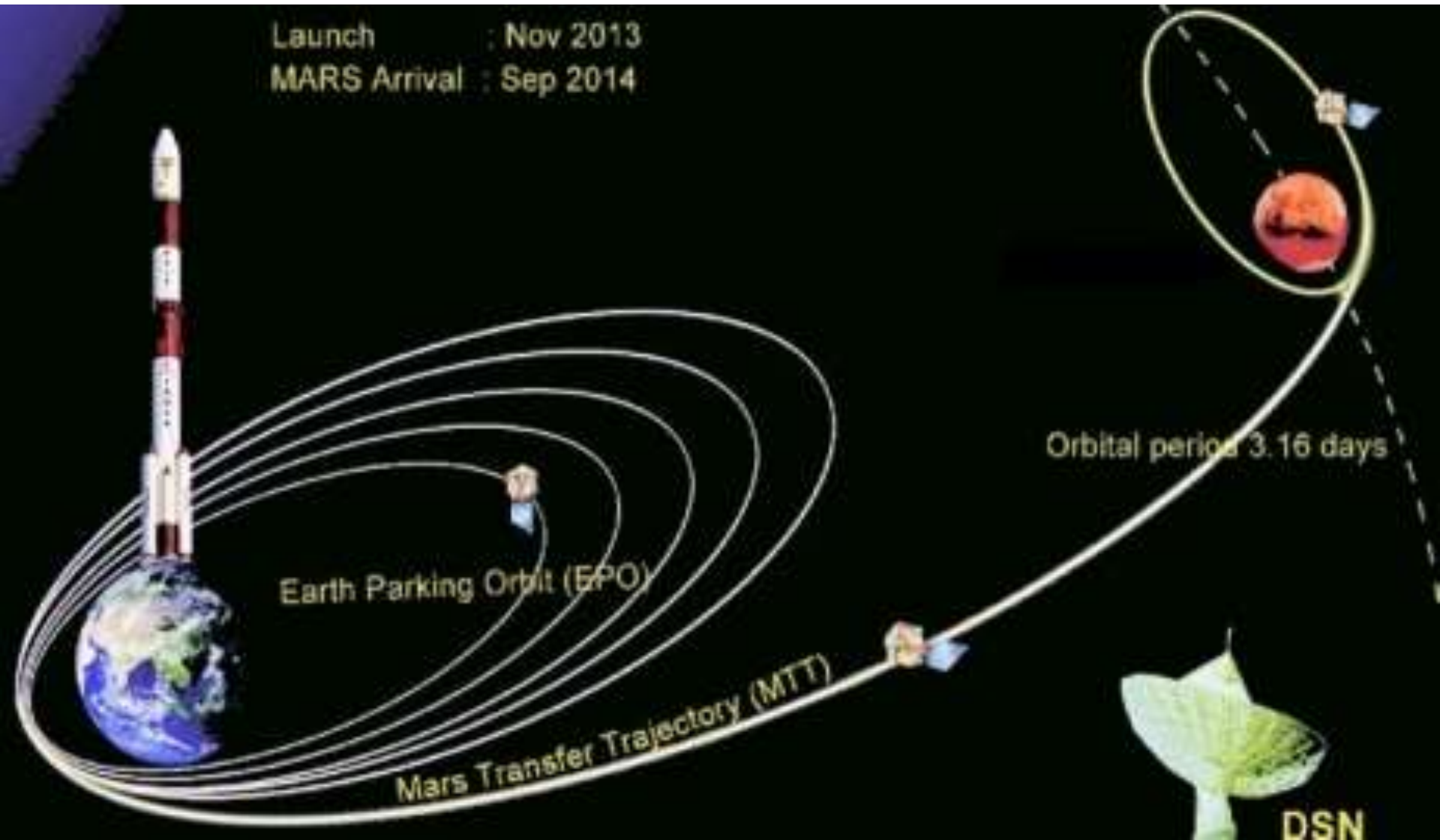
2000



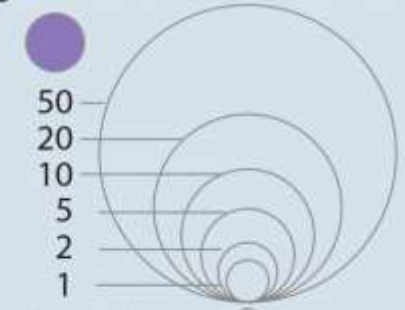
2016 Mangalyaan



Amazing Mars missions



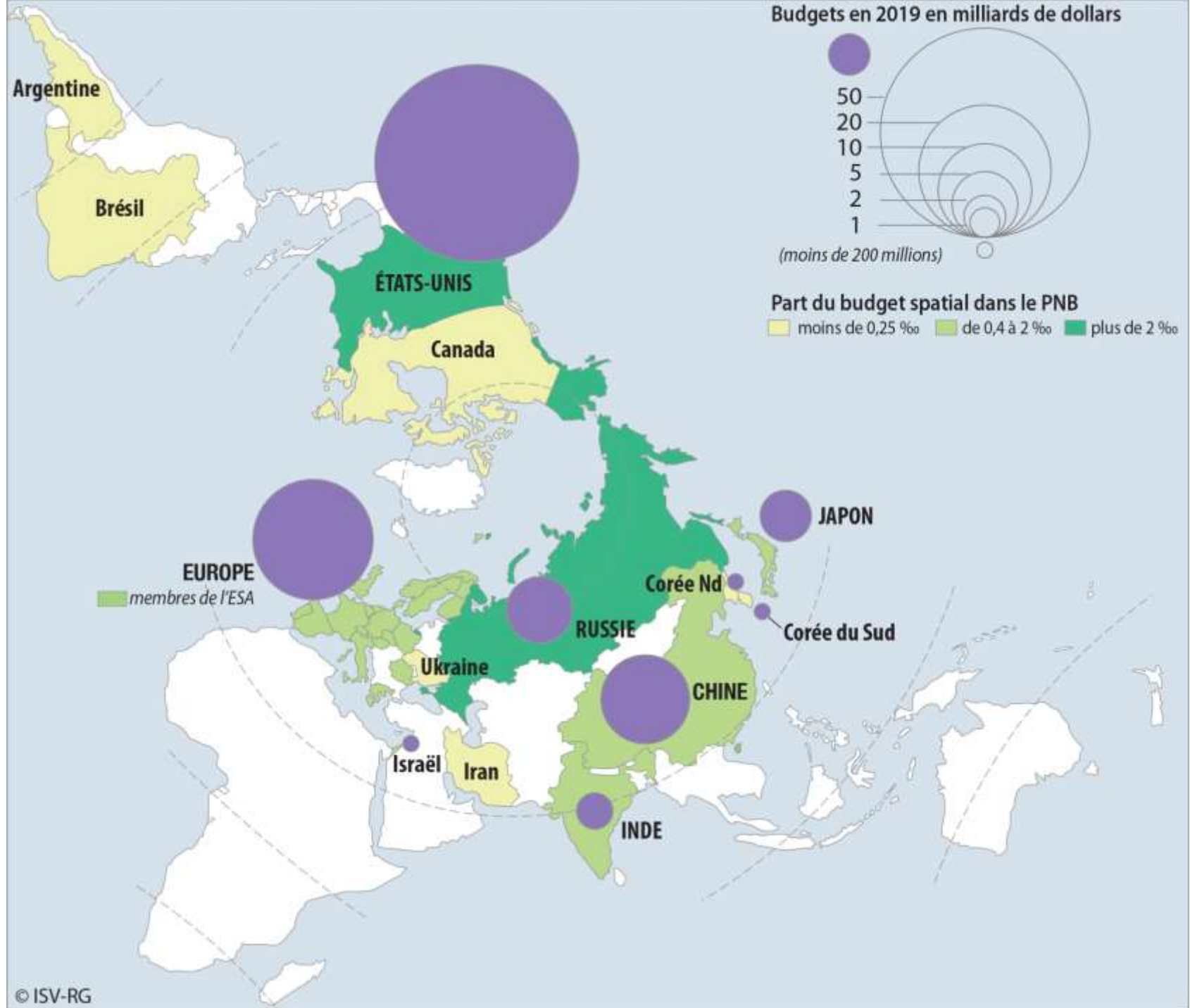
Budgets en 2019 en milliards de dollars



(moins de 200 millions)

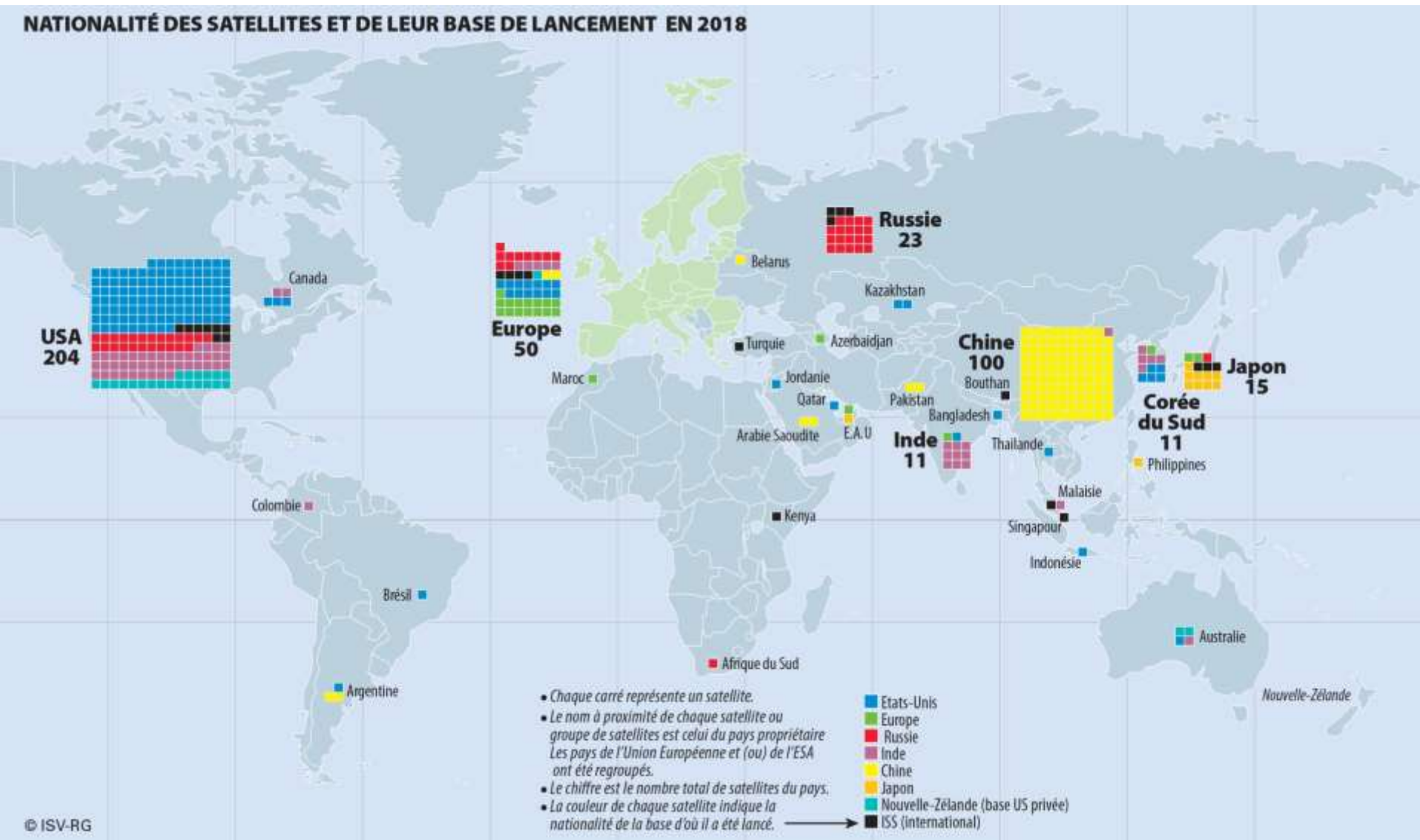
Part du budget spatial dans le PNB

- moins de 0,25 ‰
- de 0,4 à 2 ‰
- plus de 2 ‰



In 2020 almost 3,000 operational satellites : half US, 15% Chinese, 8% Russian, 2% Indian

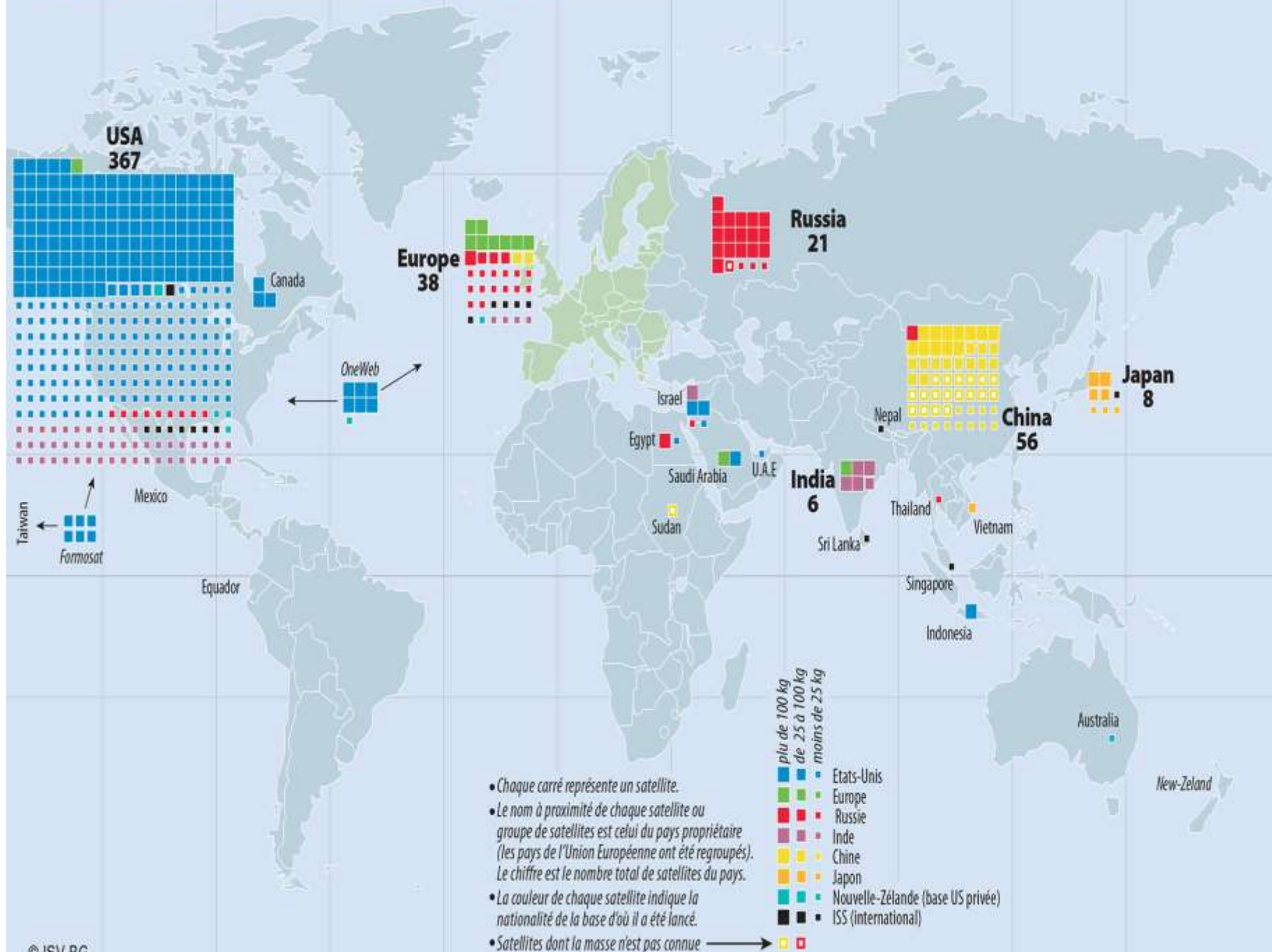
2018 launches



Space and STI policy

- Space has a natural role to play in 10. et 11. of STI policy such as “to strengthen India’s competitiveness in STI and promote science diplomacy internationally / at a global level so that the nation continues to maintain a competitive edge in science, technology, innovation and research, globally”.
- Space duly mentioned in the Chapter 6: Technology Development and Indigenisation

NATIONALITÉ DES SATELLITES ET DE LEUR BASE DE LANCEMENT EN 2019



PSLV advantages to launch small satellites

Petits satellites mis en orbite

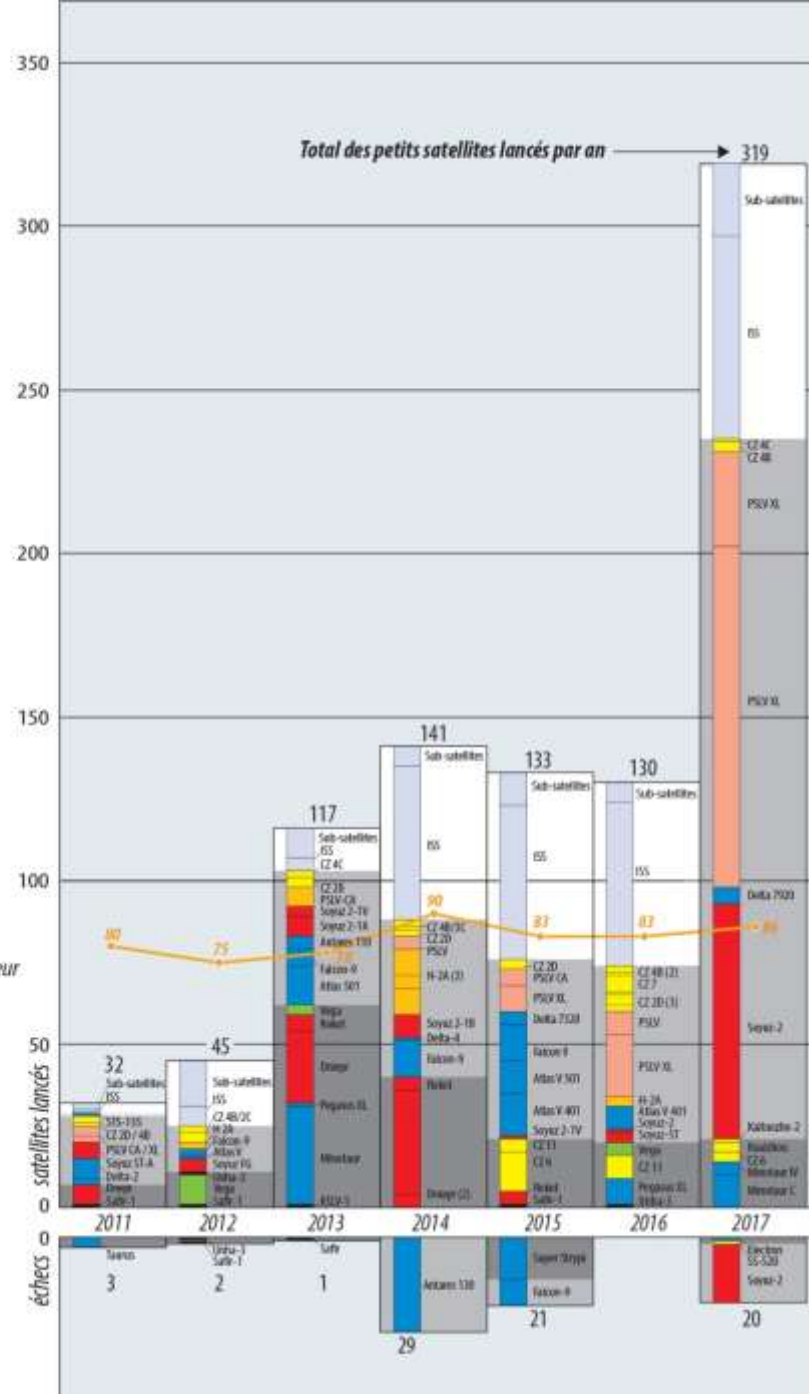
par un lanceur :



Nombre total de lancements par an :



Type de lanceur :



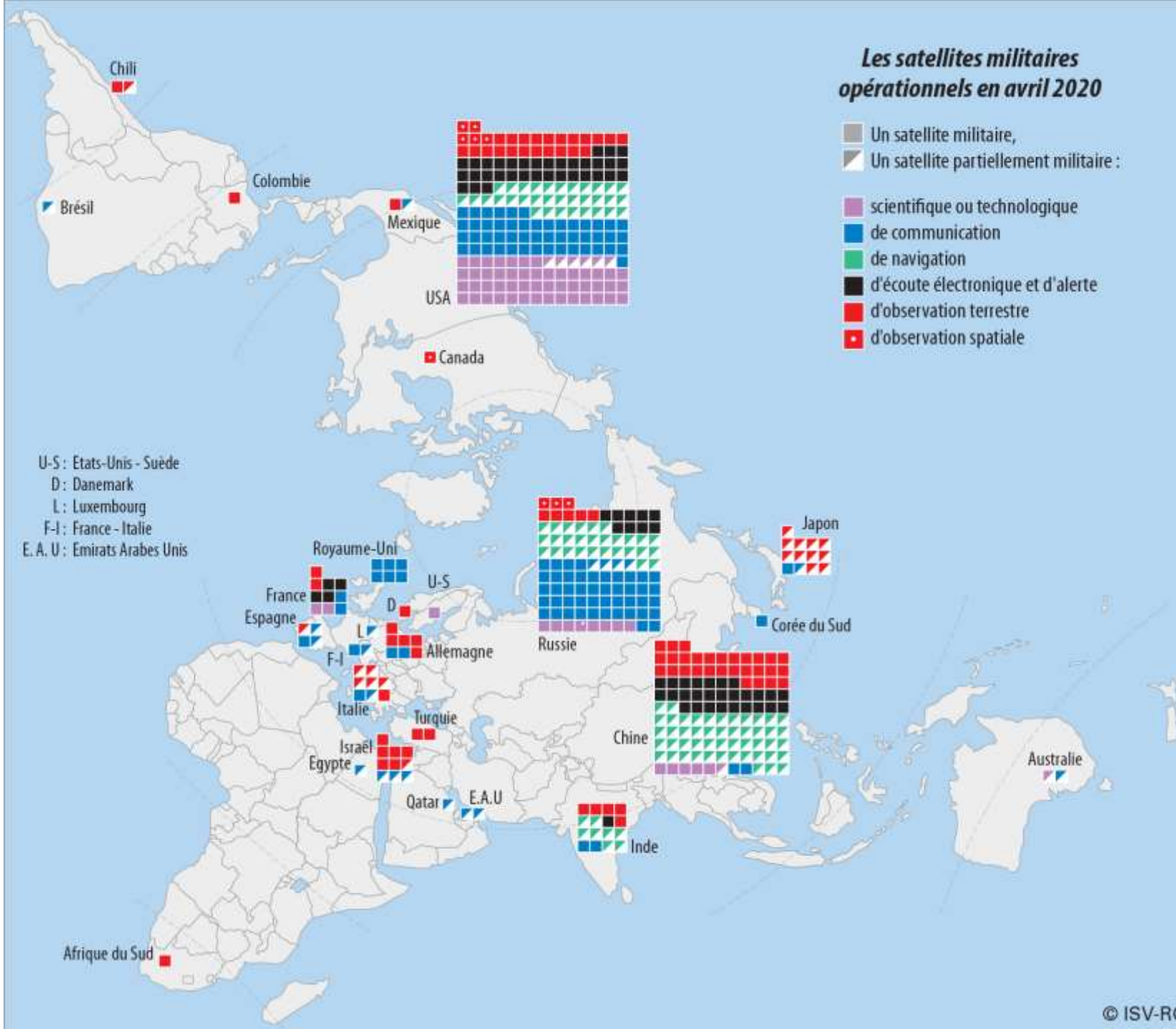
New challenges for space

- Military space ISRO/DRDO
- Manned flights
- R&D focus
- Commercialisation and private industries

Les satellites militaires opérationnels en avril 2020

-  Un satellite militaire,
-  Un satellite partiellement militaire :
-  scientifique ou technologique
-  de communication
-  de navigation
-  d'écoute électronique et d'alerte
-  d'observation terrestre
-  d'observation spatiale

U-S : Etats-Unis - Suède
 D : Danemark
 L : Luxembourg
 F-I : France - Italie
 E. A. U : Emirats Arabes Unis





“Manned space mission for 2022” 75ème anniversaire Indépendance

LES ACTEURS DU SECTEUR SPATIAL EN INDE

ACTEURS : ○ ISRO □ Entreprises industrielles

ACTIVITÉS : Propulsion Structure Avionique

Recherche & développement Tests Assemblage - intégration Production Centre de lancement

