Geodesy and Basic National Infrastructures

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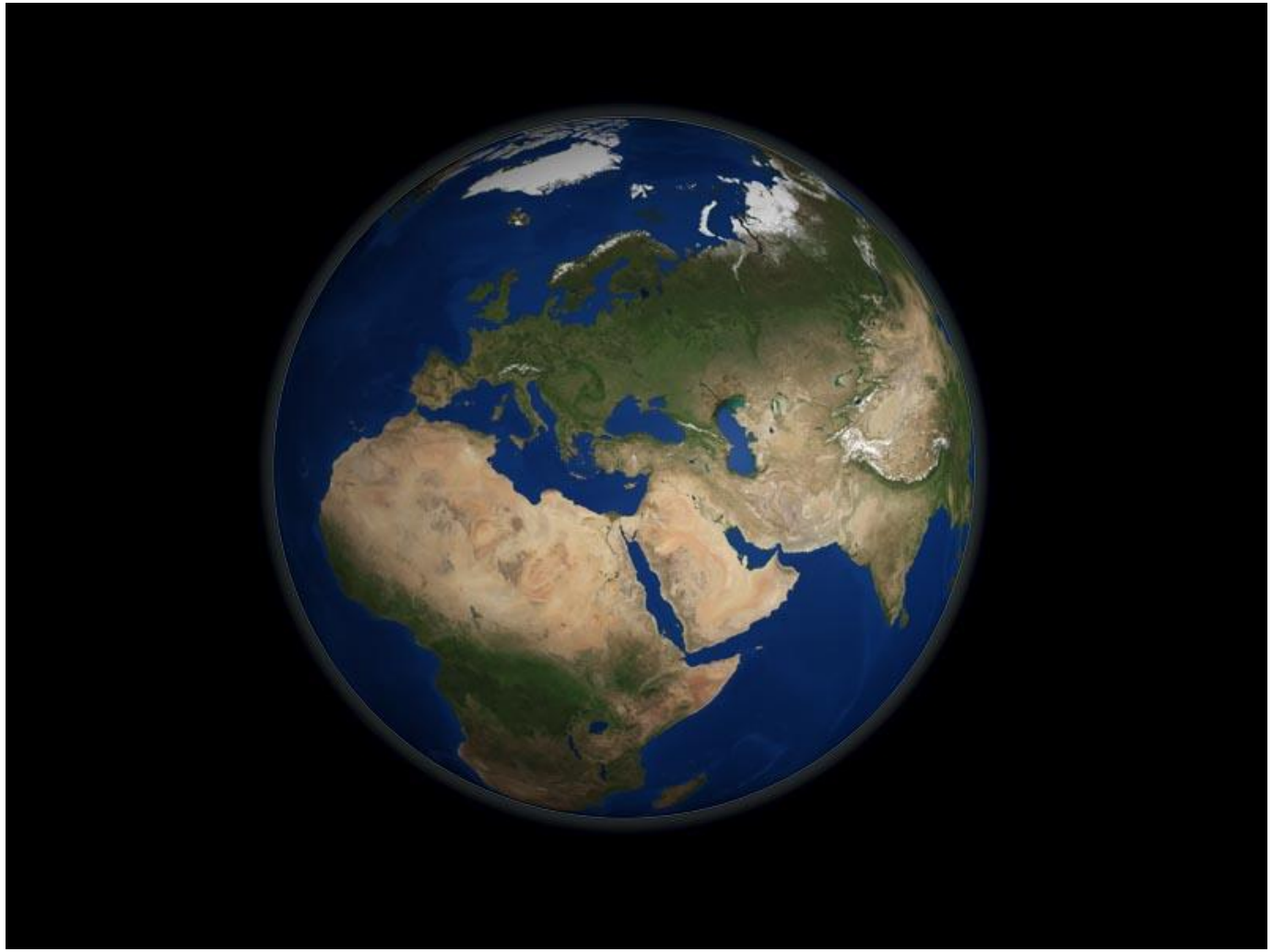
DTU Space Executive Board
Chair of ABLOS

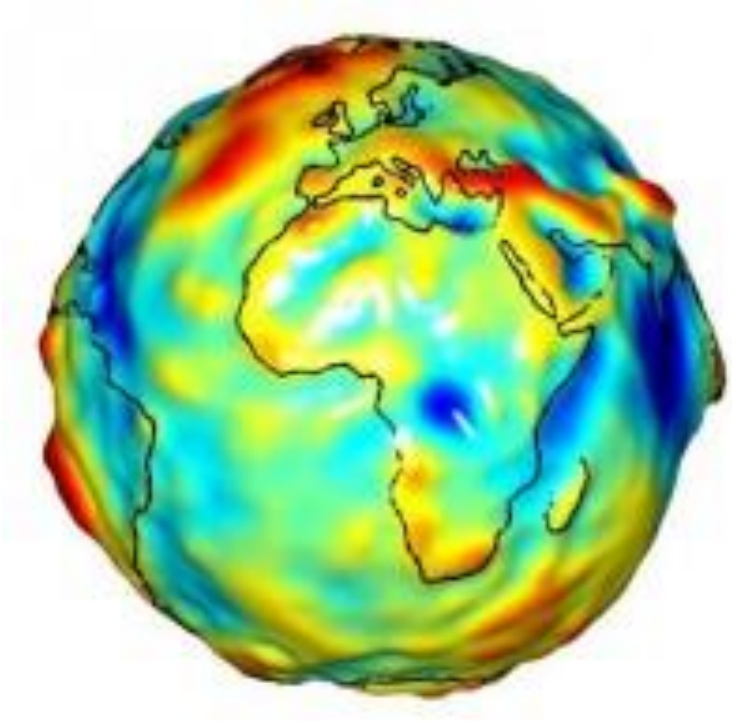
Geodesy and Basic National Infrastructures

- From Terrestrial/Physical/Space Geodesy to ? Geodesy
- Delimitation
- Sovereignty – A Case Study



Planet Earth and it´s Shape

Planet Earth as a Coordinate system



Planet Earth as a Dynamic system

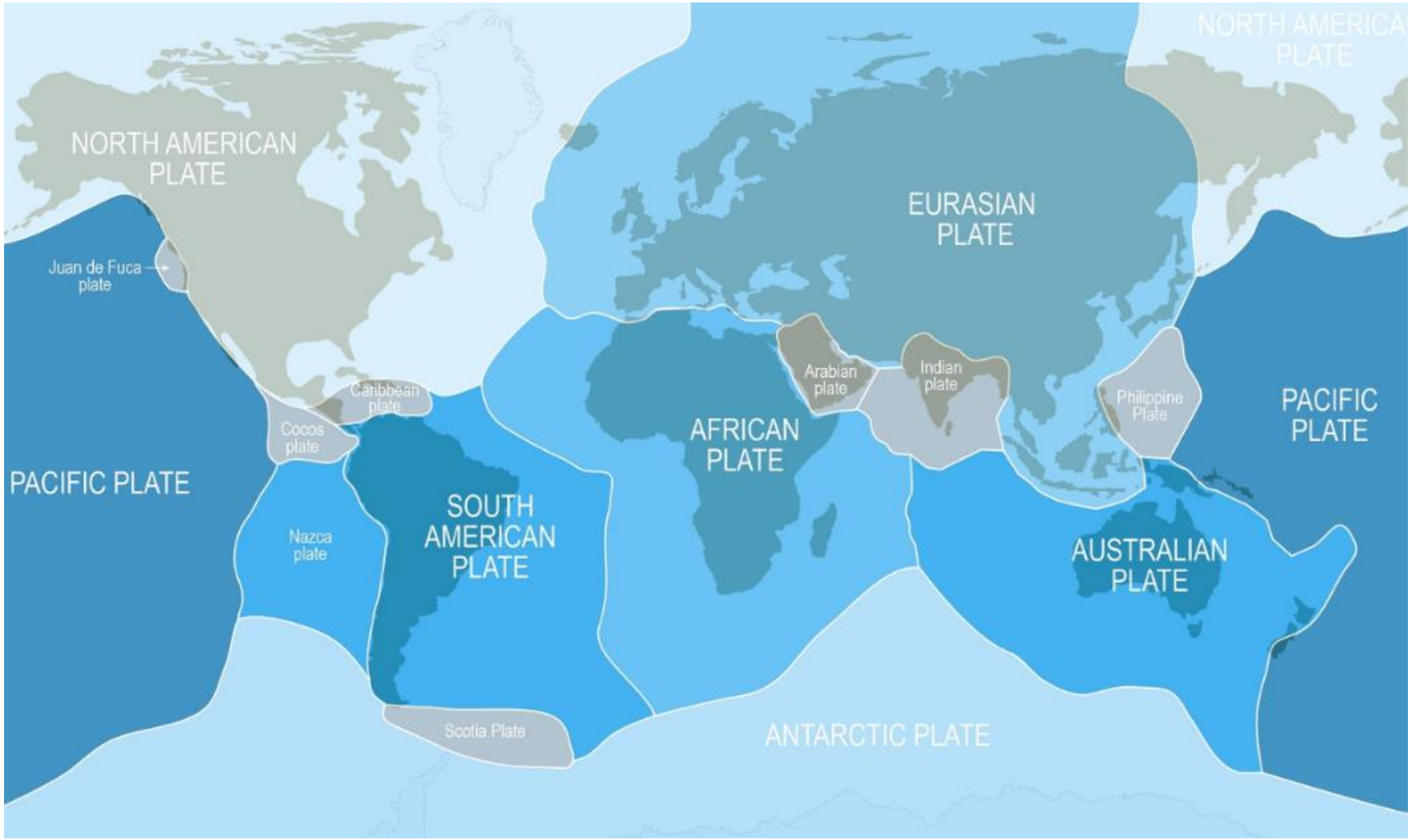
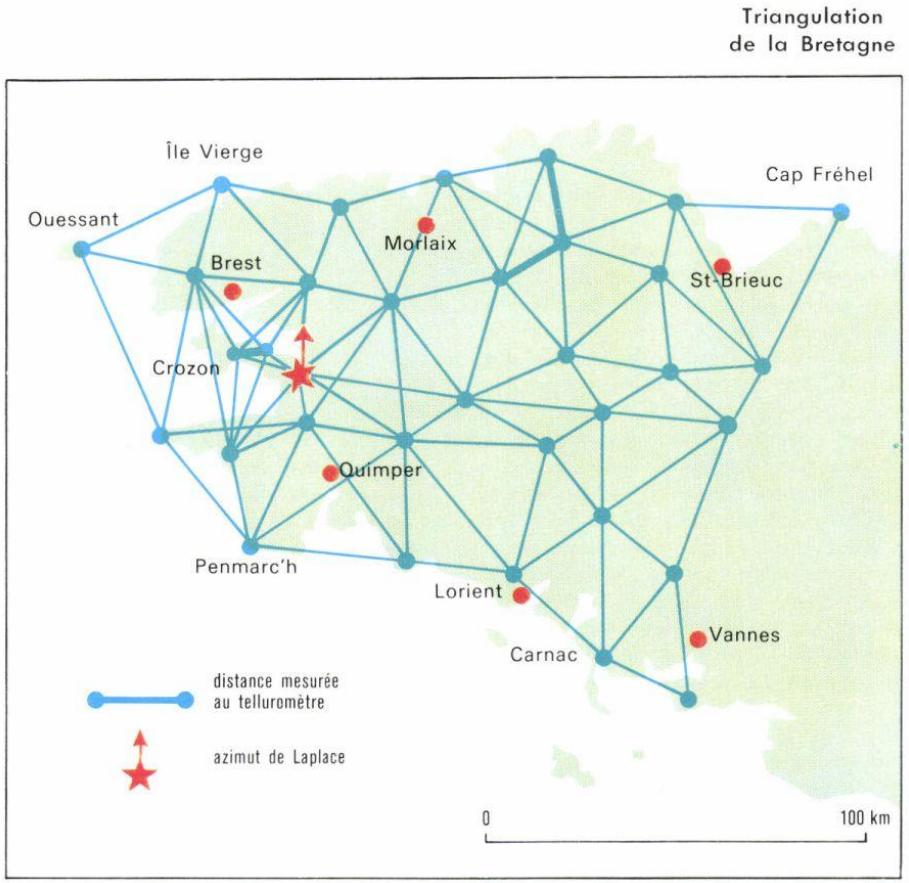
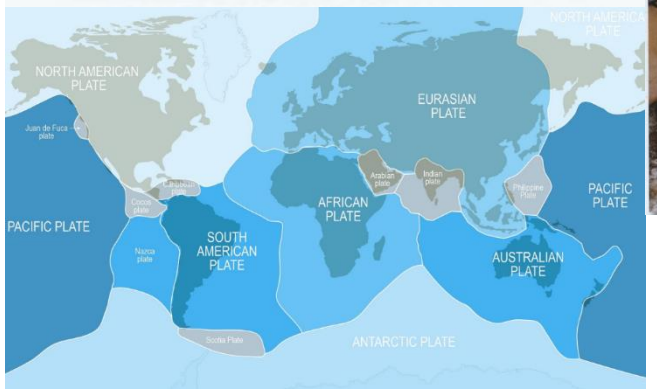


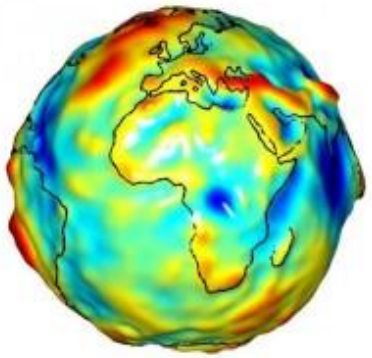
Plate tectonics

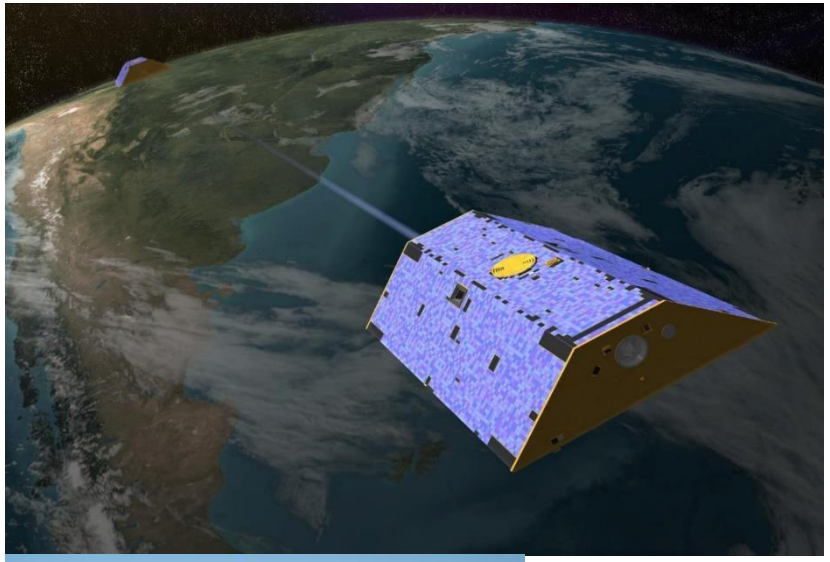


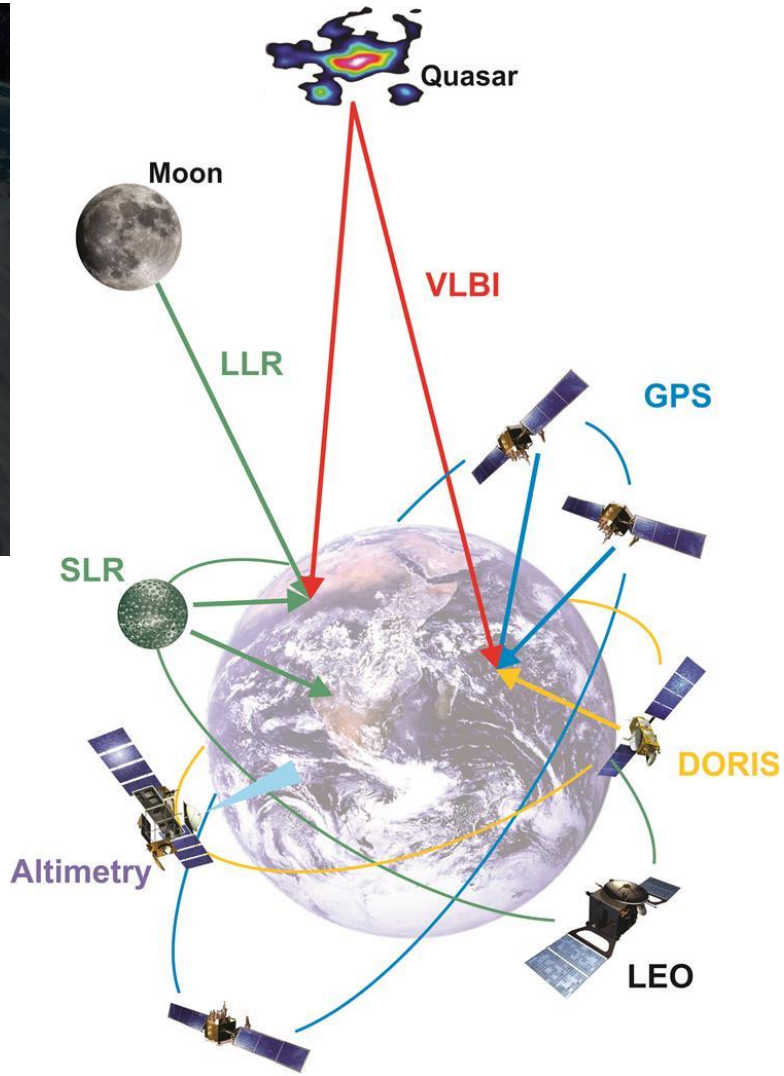
Triangulation network



Time-series of geodetic observations







Space Geodesy - Precise satellite orbits

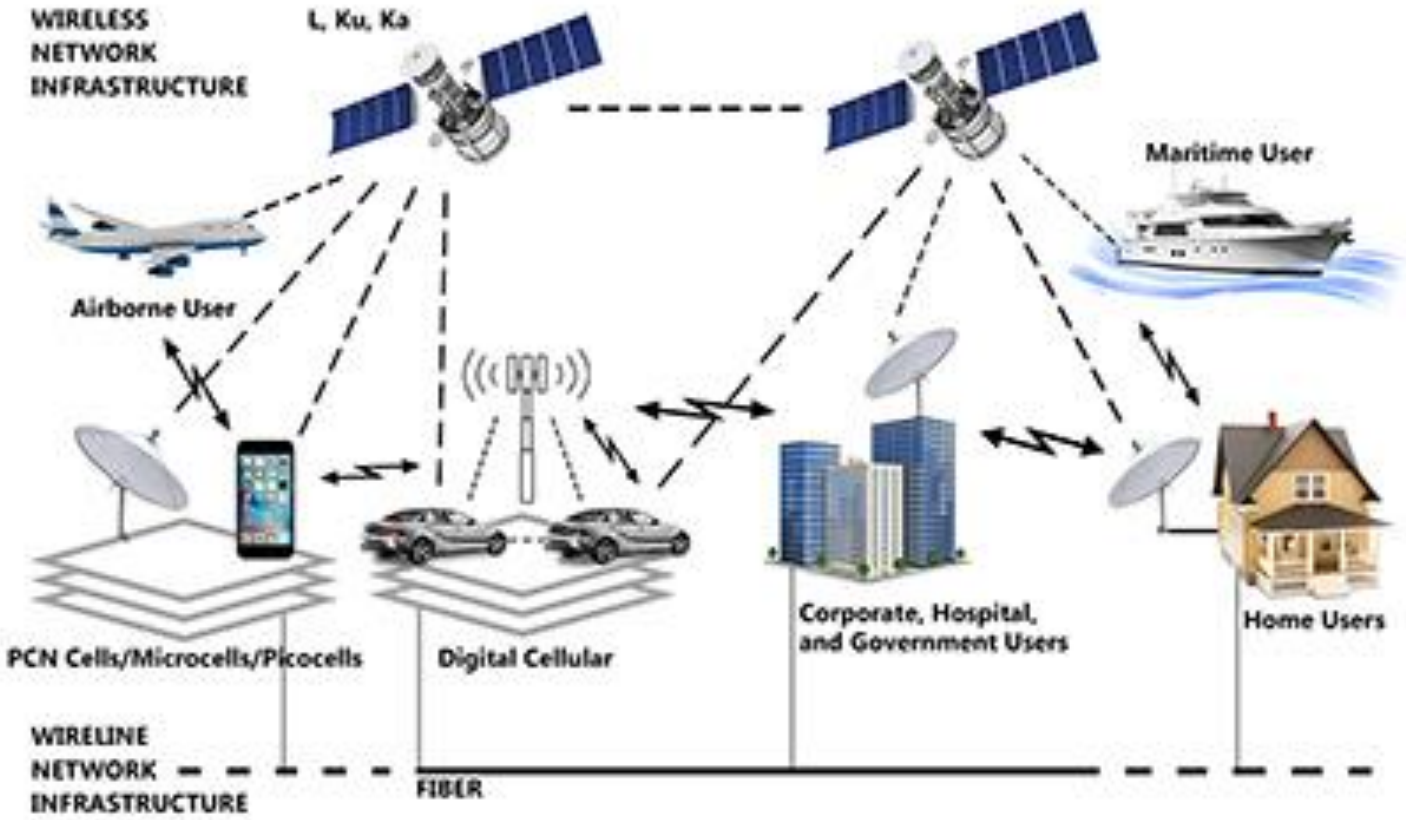


Figure 2: Hybrid networks—integrated and interoperable satellite and terrestrial network

Space Geodesy

ITRS (ITRF)

Dynamic Reference Frames (RTK)

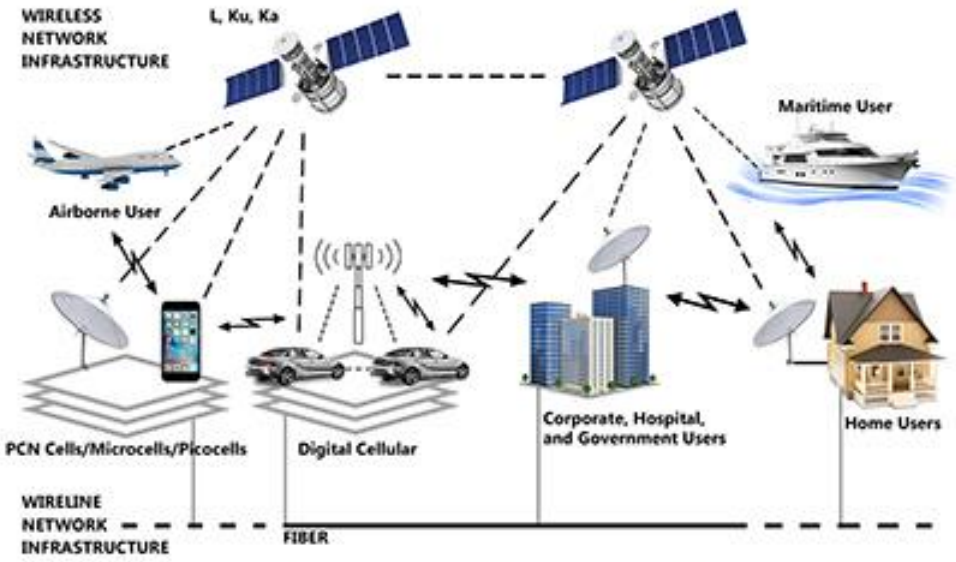


Figure 2: Hybrid networks—integrated and interoperable satellite and terrestrial network

$P_t(x,y,z)$ ⟹ $P_{(x,y,z)}(t)$ - Seamless or Dynamic Reference Frames

Example: Surveying with atomic clocks

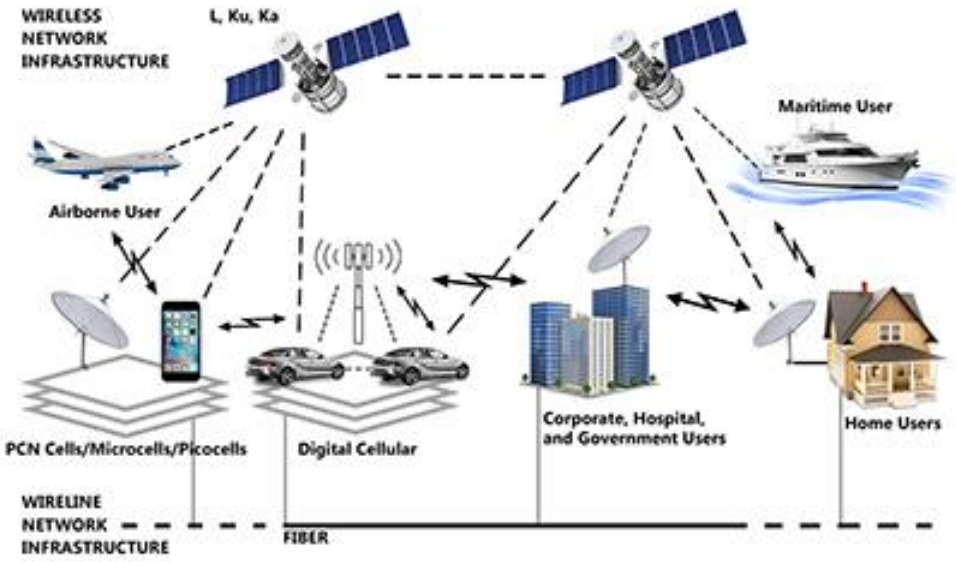
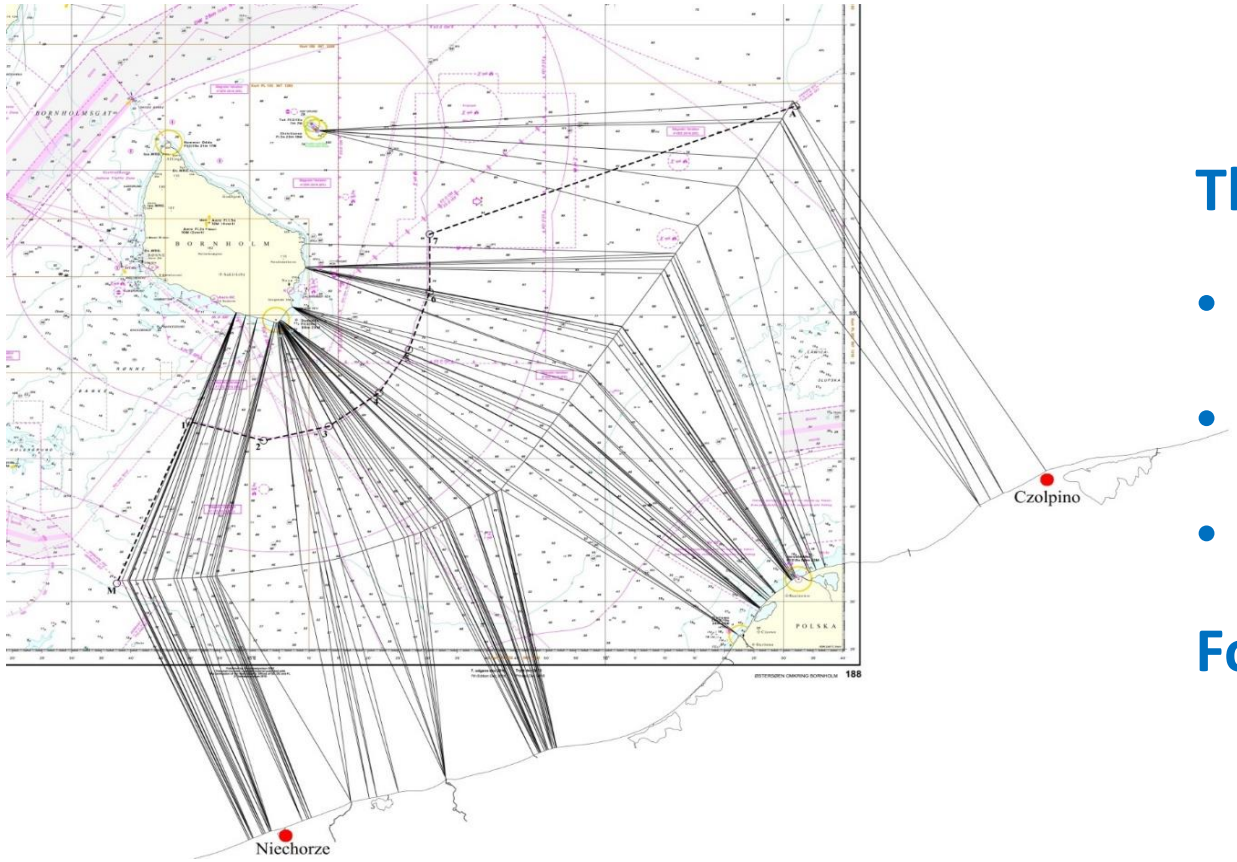


Figure 2: Hybrid networks—integrated and interoperable satellite and terrestrial network

$P_t(x,y,z)$ ⟹ $P_{(x,y,z)}(t)$ - Seamless or Dynamic Reference Frames

Example: Surveying with atomic clocks

”Don not ask where you are, but what time is it …”



Three-Stage Approach

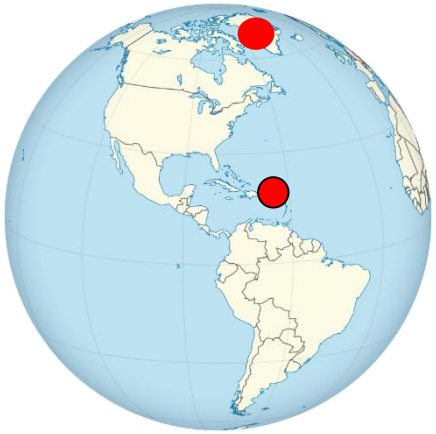
- Provisional Equidistance line
- Adjustment of equidistance line
- Disproportionality

For an Equitable solution

Geodesy and Sovereignty

Danish West Virgin Islands

1917

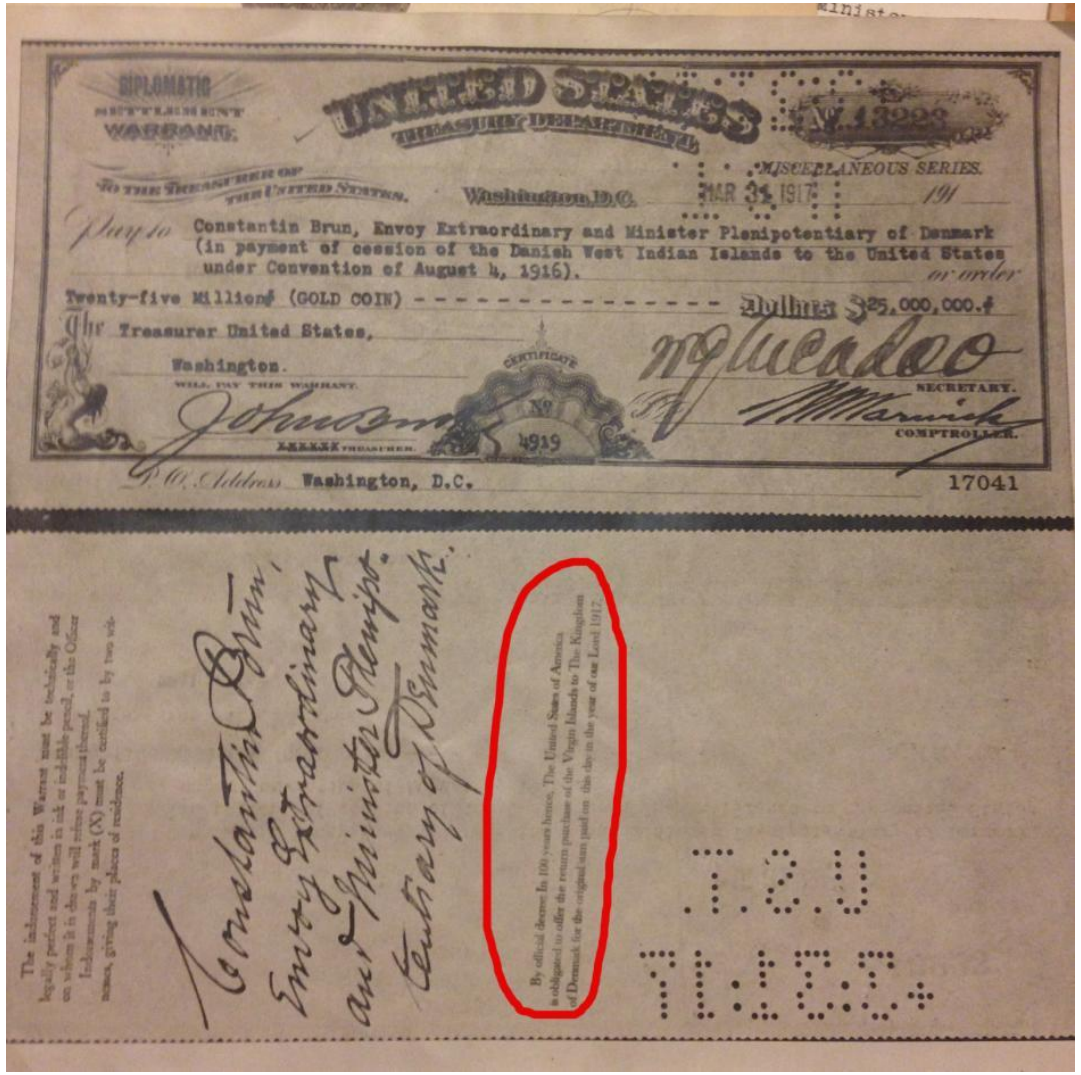


Greenland

1931 ICJ

Geodesy and Sovereignty

SECURE A MODERN AND VISIBLE NATIONAL GEODETIC ORGANISATION



»By official decree: In 100 years hence, The United States of America is obligated under condition of sale to offer the return purchase of The Danish West Indian Islands to The Kingdom of Denmark for the original sum paid in the year 1917 on the day of our lord, April first«