

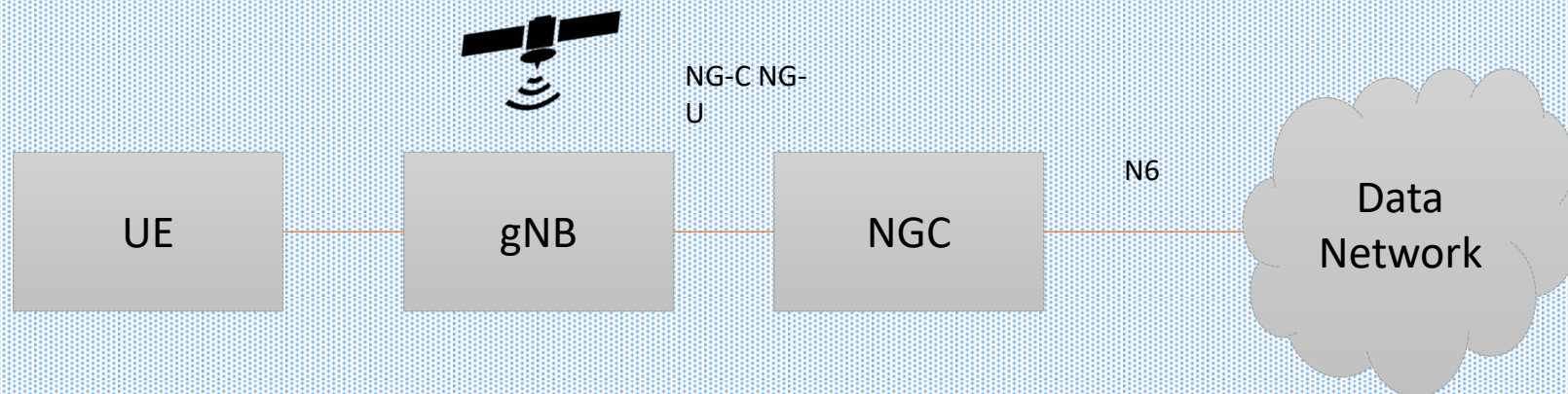
5G NTN

PROF. KIRAN KUCHI
IIT HYDERABAD

NTN: Non Terrestrial Networks



- 3GPP enables the cooperation of satellite with terrestrial networks to provide the 5G services with the promised key performance indicators:
 - Global coverage & mobility
 - Service ubiquity
 - Overall network reliability and security



NTN: Use cases

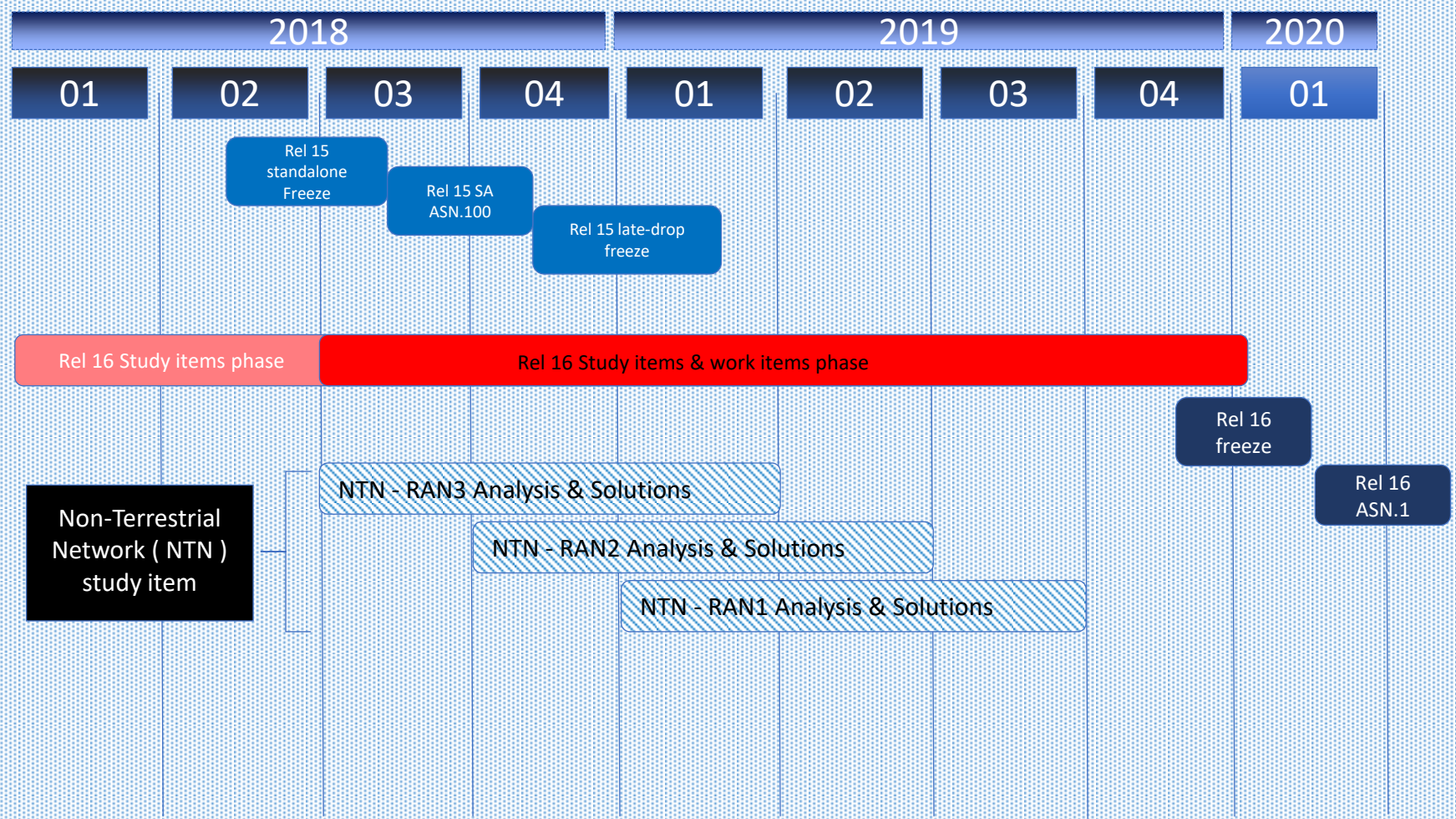


- 5G service roll out in ***un-served or underserved areas*** to upgrade the performance of terrestrial networks.
- Reinforce ***service reliability by providing service continuity*** for user equipment or for ***moving platforms***.
- Increase service availability everywhere; especially for ***critical communications, future railway/maritime/aeronautical communications***
- Enable 5G network scalability through the provision of efficient ***multicast/broadcast resources*** for data delivery towards the network edges or even directly to the user equipment

Satellite Subsystem in 5G

- NTN:
 - *Space-borne vehicles* in
 - **Low Earth Orbits (LEO)**
 - **Medium Earth Orbits (MEO)**
 - **Geostationary Earth Orbit (GEO)** or in **Highly Elliptical Orbits (HEO)**
 - *Airborne vehicles* High Altitude Platforms (HAPs) encompassing Unmanned Aircraft Systems (UAS) (tethered UAS, Lighter than Air UAS and Heavier than Air UAS) - operating at altitude; typically between 8 and 50 km, quasi-stationary
- Roles and benefits of satellites in 5G have been studied in 3GPP Release 14
- Service provisions considering integration of 5G in satellite access

NTN Roadmap with 3GPP Timeline for Rel. 16



Workgroups and Standard Specifications



Workgroups	Specifications	Title
RAN1	38.811	Study on New Radio (NR) to support non-terrestrial networks
RAN2/3	38.821	Solutions for NR to support non-terrestrial networks
SA1	28.822	Study on using satellite access in 5G