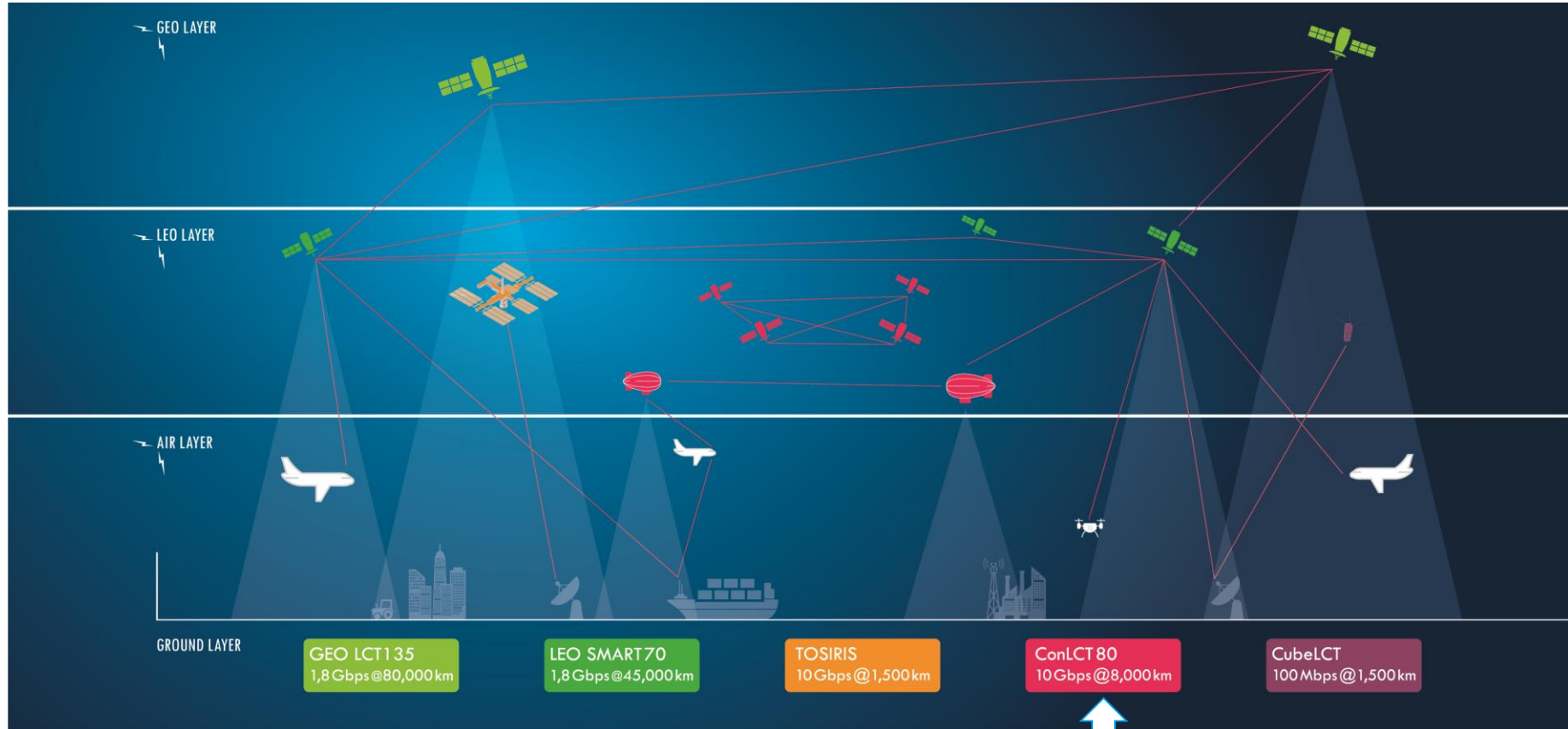




LASER COMMUNICATION IN SPACE

EPIC Forum 2021



320^M

EURO REVENUES IN LASER PRODUCTS
reached

51^K

OPTICAL INTER-
SATELLITE LINKS

1

one SITE WITH
INTEGRATED R&D AND
MANUFACTURING

80

CONLCTs PER MONTH
PRODUCTION CAPABILITY

1ST

LEO CONSTELLATION LCT
LAUNCHED IN 2008

11

LCTs IN ORBIT

+30

YEARS OF IN ORBIT
OPERATION

1064^{NM}

1550^{NM}

WAVELENGTH and variances in
MODULATION (OOK/BPSK/QPSK)
and DATA RATES (1G-100G)

99,9%

SUCCESS RATE IN
PERFORMING ISLs

150

LCT SYSTEM AND
AIT ENGINEERS



- » More than 14 years In-Orbit Heritage (**Design, Production, Software, In-Orbit Operations**)
- » 10 LCTs in Orbit with more than **50.000 successful Laser Links**; growing each month by 1.000 links...
- » Diversification of the LCT product portfolio over the last 15 years;
wavelength agnostic: (1064/1550) nm; modulation agnostic: **OOK/PPM/BPSK/QPSK**
including optical ground stations and after sales service
- » Next launch dates:: SMART70 LEO 2xPléiades, ConLCT US; TOSIRIS UK...



NFIRE/TERRASAR
LEO — LEO



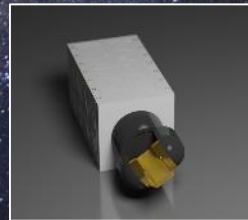
LCT135
GEO / EDRS



SMART70
LEO DATARELAY



ConLCT80
LEO CONSTELLATION



TOSIRIS
SPACE2GROUND (ISS)



CUBEL
CUBESAT DOWNLINK

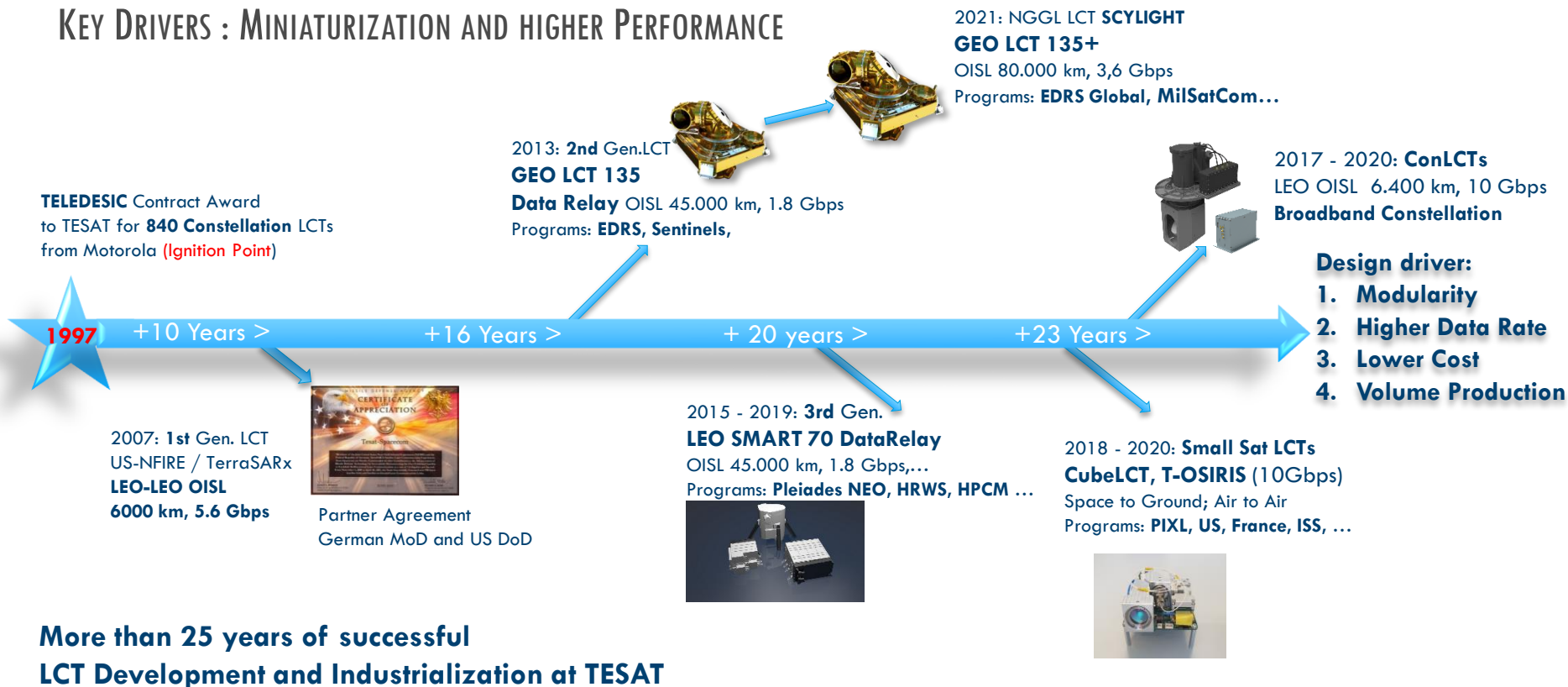
1064 nm

1550 nm

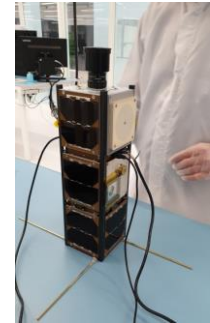
PROVEN TECHNOLOGY - LASERCOMM PROGRAM OVERVIEW



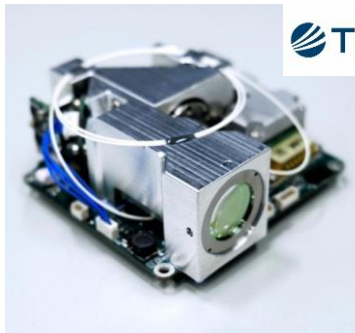
KEY DRIVERS : MINIATURIZATION AND HIGHER PERFORMANCE



- » CubeLCT is an optical Transmitter for optical data downlinks from LEO
 - » Technology Cooperation with German Space Agency DLR-IKN
 - » CubeL: **380g / 100 Mbps**
 - » CubeL+: Evolution to 1Gbps by end 2021
 - » The 10 Gbps Version (TOSIRIS) will perform on ISS by end of 2021
-
- » **In-orbit verification in PIXL-1 Program**
SpaceX Launch 14.01.2021



© GOMSPACE



© DLR IKN



TESAT
takes
Responsibility
for End to End
(Space to
Ground)
System

and joint

OPTICAL
Communication
Alliance



DLR IKN
Institute of
Communications and Navigation

and

GSOC
German Space Operation Center

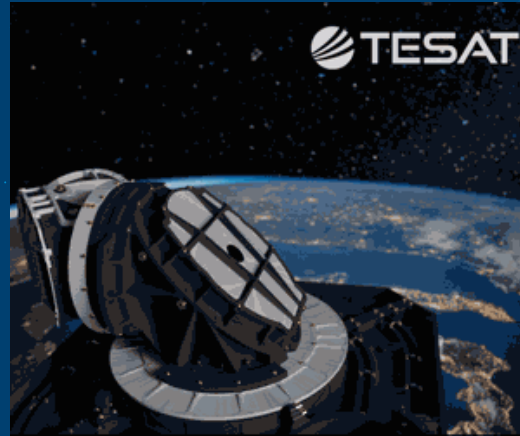


KSAT
Kongsberg Satellite Services

KSAT and Tesat signed laser
communication pact

KSAT partner for first global
commercial optical ground system

stay tuned



Matthias.Motzigemba@TESAT.de