SCHEDA TECNICA DETTAGLIATA DELLA STRUMENTAZIONE NECESSARIA

GRUPPO 1

1. 1 Photodiode detector for laser power measurement up to 36 mW, Noise equivalent power 10 pW, 10 mm Ø Aperture, Spectral range 350 - 1080 nm. Typical rise time 0,2 s. Peak sensitivity 0.5 A/W @ 980 nm, Minimum repetition rate 155 kHz. Maximum average power density 100 W/cm². NIST-traceable calibration in nm steps. Dimensions 38.1Ø x 27.4D mm; Weight 0.13 kg.

2. 2 Stand with 2 x 3in base, 3in cylinder, delrin post, ¼-20 & 8-32. Stand for photodiodi

3. 1 Photodiode detector for laser power measurement up to 30 mW, Noise equivalent power 60 pW, 5 mm Ø aperture, Spectral range 800 - 1650 nm, Typical rise time 0,2 s. Peak sensitivity 0.98 A/W @ 1550 nm, Minimum repetition rate 155 kHz. Maximum average power density 100 W/cm². NIST-traceable calibration in nm steps. Absorber Germanium, Dimensions 38.1Ø x 27.4D mm. Weight 0.13 kg

4. 1 Thermal detector for laser power measurement up to 100 W (CW), Maximum average power (1 minute) 200 W. Noise equivalent power 3 mW, Aperture diameter 25 mm. Spectral range 0.193 - 20 µm, Typical rise time 1.3 s, Typical power sensitivity 0.23 mV/W (Into 100 kΩ load), Power calibration uncertainty ±2.5 % (Including linearity with power), Repeatability ±0.5 %. Maximum average power density 45 kW/cm² (at 1064 nm, 10 W CW). Maximum energy density 1 J/cm² (at 1064 nm, 7 ns, 10 Hz). Dimensions 89H x 89W x 106D mm; Weight 0.99 kg

5. 1 Touchscreen display device for power & energy measurement. Single-channel, multiple outputs (USB, RS-232, PC-USB, Ethernet, analog). Data display: Real time, scope, statistics, digital tuning needle and averaging. REAL-TIME Statistical functions: max, min, average, standard deviation, RMS and PTP stability, pulse # and repetition rate.
   Power meter specifications: Power range 4 pW – 30 kW, Device accuracy 0.25 % ±5 µV best scale.
   Energy meter specifications: Energy range 2 fJ - 30 kJ, Device accuracy ±1 %. External trigger TTL Compatible, 2-25 V @0.4 mA, data storage via USB key. Battery life 6.5 hours, Battery type 4 x Rechargeable 1.2 V Ni MH AA. Digital display size 112.9 x 84.7 mm LCD - 640 x 480 pixels
   FREE software PC.

6. 1 STAND-S-443 Stand, 4 x 4in base, 3in cylinder, steel post, 8-32 & ¼-20 for UP25N-100H-H9-D0.

7. 1 Laminar Flow System
   Filter Area (widthxdepth): 1220 x 610 mm; Working Area (BxT): 1255 x 645 mm

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI “Physical Science and Engineering”, Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell’ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata “Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall’Unione europea – NextGenerationEU.

Clearance Inside: 760 mm; Total height with Module: 1365 mm;
Total height, door opened: 1423 mm
Filter Module / Settlement:

- 8 steps air flow setting, reproducible values by indication of flow speed in display
- Including eco mode (night), purge function and operating hour counter
- Indication for fault and filter charging
- Four pre-filters
- Suspended particle filter class H14: based on the most-penetrating particle size (MPPS), excludes 99.995 % of particles > 0.12 µm and excludes 99.9995 % of particles > 0.3 µm
- Filter change from the top
- The insulation factor is 104 - Underneath the laminar flow module, the air quality is 10000 times better than in the immediate environment. For example: immediate environment 1000000 particle/ft³ equates <100 particle/ft³ underneath Laminar Flow Module
- Clean Room class 100 according US Fed. 209E, or ISO 5 according DIN ISO 14644-1 and better (underneath Laminar Flow Module)

Fans:

- Exceptionally quiet electronically commutated (EC) fan, noise level (0,40 m/sec): 53 db(A) SuSi (SuperSilent) and without the humming noises of the typical AC fan
- centrifugal (radial) fans 150 Pa, 2x 2580 m³/h, 230 V, 50 Hz, with emergency operating functionality
- Air flow at the clean room side approx. 1350 m³/h
- The average power input is 125 W and the operating costs are therefore low
- Maintenance-free fan unit
- Backward curving centrifugal fans
- Special coating of the fan blades to prevent dust contamination
- The special fan suspension reduces vibrations to a minimum
- The fans are dynamically balanced in two planes according to DIN ISO 1940 standards.

General information /Acrylic glass box:

- Hood in white RAL 9003, plastic-coated
- The upward sliding door with balance weight stops in any position (Mechanism covered)
- Access door opening height max. 480 mm
- Worktop: perforated and removable
- Side walls are made of acrylic glass
- Two holes for cable feedtrough at the back wall
- Design consisting of aluminium sections, anodized natural and cleanroom capable
- Qualification and particle count according to DIN ISO 14644-1 confirmed with a corresponding certificate
- Warranty period: 24 months, except wear parts

8.

1 LED Interior Lighting for flow chamnber

- Controlled via the Laminar Flow Box
- 230 V / 50 Hz
- power draw 32 W

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI “Physical Science and Engineering”, Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell’ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata “Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall’Unione europea – NextGenerationEU.

- luminous flux 2740 lm
- luminous color neutralweiß
- color temperature: 4000 K
- including Safety Screen

9.

1 Flow Control with automated flow adjustment
Continuous Set-Actual Comparison, Automatically Keeps the Flow Rate at the Set Level.

10.

1 CW laser diode 980 nm, Max power 200 mW, Linewidth FWHM ≤ 1.2 nm, Adjustable power. Plug&Play, Includes ControlBoxx and 100-240 VAC external power supply - does not include heatsink. Power stability over 8 hour, temperature within +/-3°C: ± 1%.
Power adjustment range: 0 to 100%. Transverse singlemode free-space beam, Beam diameter (typ) at $1/e^2$, 5 cm from the beam aperture: 0.9 mm. Beam divergence at $1/e^2$ full beam, in far field: 2.3 mrad. Beam quality factor $M^2 \leq 1.25$. Polarization state Linear, vertical at ±5°. Polarization ≥ 50:1.

11.

2 695 ULTRA Longpass Dichroic Beamsplitter

Cut-On Wavelength	695 nm ± 4.0 nm
Reflection Band(s)	400 to 684.5 nm > 98% R Average
Transmission Band(s)	705.5 to 850 nm > 95% T Average
Transmitted Wavefront Error	< 0.25 Wave RMS @ 632.8nm
Parallelism	< 3.0 Arcseconds
Dimensions	25.2×35.6 mm
Filter Thickness	1.05 mm
Substrate Type	Fused Silica
Assembly Type	Unmounted

12.

4 589-10 OD4 bandpass filter

Center Wavelength	589 nm ± 2.0 nm
FWHM	10 nm ± 2.0 nm
Transmission Band(s)	Peak> 90% T Absolute
Blocking Level	OD4
Blocking Range(s)	OD4: 200 to 574 nm, 604 to 1200 nm
Dimensions	25.0 mm Diameter
Filter Thickness	3.3 mm
Substrate Type	Borofloat®
Assembly Type	Anodized Aluminum Ring
Assembly Thickness	5.0 mm

13.

4 1064-10 OD4 bandpass filter

Center Wavelength	1064 nm ± 2.0 nm
FWHM	10 nm ± 2.0 nm

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI "Physical Science and Engineering", Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell'ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata "Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall'Unione europea – NextGenerationEU.

Transmission Band(s)	Peak> 90% T Absolute
Blocking Level	OD4
Blocking Range(s)	OD4: 1079 to 1200 nm, 200 to 1049 nm
Dimensions	25.0 mm Diameter
Filter Thickness	3.3 mm
Substrate Type	Borofloat®
Assembly Type	Anodized Aluminum Ring
Assembly Thickness	5.0 mm

14.

1 CMOS Compact Scientific Camera, USB 3.0 Interface.
Max Frame Rate: 21.7 fps (Full Sensor); Read Noise: <2.5 e- RMS;
Fanless Passive Thermal Management; Large Field of View.
Peak Quantum Efficiency: 72% Over 525 to 580 nm.
Removable Optic: AR-Coated Window, Ravg < 0.5% per Surface (400 - 700 nm)
SM1-Threaded (1.035"-40) Aperture with Adapter for Standard C-Mount (1.000"-32).

15.

4 White frame for Dye lasers, Full protection
Colour Purple, Polycarbonate, VLT 12%, 577-596 nm OD 7, D LB6 IR LB7
560-600 nm OD 3 DIR LB3, 570-598 nm OD 4 DIR LB4, 574-597 nm OD 5 DIR LB5
Goggles compatible with all corrective glasses

16.

4 White frame for UV-Diode-Nd:YAG-CO2 lasers, Full and alignement protection, Green, Polycarbonare, VLT 42%, 920-1075 OD 6 DIR LB6 M LB6Y,
190-315 nm OD 5 D LB5 IR LB3, 315-430 nm OD 5 DIR LB5, 750-1100 nm OD 3 DIR LB3,
775-1100 nm OD 4 DIR LB4, 790-1090 nm OD 5 DIR LB5, 1000-1070 nm OD 7 D LB6 IR LB7 M LB7Y,
1030-1065 nm OD 8 D LB6 IR LB8 M LB7Y, 10600 OD 6 DI LB4.
Goggles compatible with all corrective glasses

17.

1 Polarimeter, Free Space and Fiber Coupled, 400 - 700 nm

18.

1 Polarimeter, Free Space and Fiber Coupled, 900 - 1700 nm

Dynamic Range		-60 dBm to +10 dBm (10^{-6} mW to 10 mW)
Sampling Rate	**Default**[b]	30 Samples/s
	Maximum[c]	400 Samples/s
Measurable SOP[d]		Entire Poincaré Sphere
Azimuth Accuracy[e]		±0.25°
Ellipticity Accuracy		±0.25°
DOP[f] **Accuracy**		±1.0%
Free Space Aperture		Ø3 mm
Input Fiber Connector		FC/PC Accepted by Included Ø12 mm Collimator[g]

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI “Physical Science and Engineering”, Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell’ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata “Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall’Unione europea – NextGenerationEU.

Included Ø12 mm Collimator[g]	F240FC-A	F240FC-B	F240FC-C
Maximum Input Beam Divergence	2°		
Warm-Up Time for Rated Accuracy	15 min		
Additional Specifications			
Command and Control Interface	USB 2.0 Mini-B		
Input Power Supply	Via USB 2.0 Mini-B Interface or DS15 External Power Supply[h]		
DS15 Power Supply Ratings	15.0 V; 1.2 A		
Operating Temperature Range	5 °C to 40 °C		
Storage Temperature Range	-40 °C to 70 °C		
Dimensions	51.0 mm x 55.0 mm x 56.3 mm (2.01" x 2.17" 2.22")		
Bottom Mounting Features	One 1/4"-20 (M6) and Two 8-32 (M4) Threaded Holes		
Weight	0.28 kg (0.62 lbs)		

19.

1 Single Frequency | CW Diode pumped lasers, Wavelength 593.6 ± 0.3 nm, Output power 100 mW, Noise, 20 Hz - 20 MHz (pk-pk) < 3%. Noise, 20 Hz - 20 MHz (rms) < 0.3%. Long-term power stability (8 hrs ± 3°C) < 3%. Beam divergence (full angle, mrad) < 1.3. Spatial mode (TEM00) M^2 < 1.1. Beam diameter at aperture 700 ± 50 µm, Spectral linewidth (FWHM) < 1 MHz. Beam symmetry at aperture >0.95:1. Polarization ratio (linear, vertical) > 100:1. Warranty 24 months, unlimited hours.

20.

1 Shack-Hartmann Wavefront Sensor (WFS) Kit with 11.25 mm x 7.03 mm Aperture; Two AR-Coated MLAs, 150 µm Pitch and 300 µm Pitch; Metric Taps. MLAs Factory Calibrated for Use with the Included Hardware. Can Be Configured as: 150 µm Pitch and AR Coating oppure 300 µm Pitch and AR Coating

21.

5 Lt Steel optical rail: length - 55 mm (metric), 42.5 mm wide, M6 mounting holes Lengthwise mounting slots for M6 screws. Suitable for mini steel optical rails system

22.

5 Lt Steel optical rail: length - 55 mm (metric), 42.5 mm wide, M6 mounting holes transverse mounting slots for M6 screws. Suitable for mini steel optical rails system

23.

10 Aluminium Post Holders for mounting posts 12 mm, length 25 mm. A slot allows clamping post holders to mounting surface using clamps like 3UTC.

24.

10 Aluminium Post Holders for mounting posts 12 mm, length 33 mm. A slot allows clamping post holders to mounting surface using clamps like 3UTC.

25.

10 Aluminium Post Holders for mounting posts 12 mm, length 50 mm. A slot allows clamping post holders to mounting surface using clamps like 3UTC.

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI "Physical Science and Engineering", Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell'ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata "Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall'Unione europea – NextGenerationEU.

26. 10 Aluminium Post Holders for mounting posts 12 mm, length 75 mm. A slot allows clamping post holders to mounting surface using clamps like 3UTC.

27. 3 Five-axis kinematic optical mount:
Fine screw thread: M6x0.25; Optics diameter Ø25.4mm; Tilt/tip range: ±2° screw thread pitch 250µm (100TPI); Sensitivity 3arcsec; XY translation range: ±2 mm screw thread pitch 250 µm (100TPI); Sensitivity for XY translation: 1µm; Sensitivity for Z translation: 1µm; Z translation range: 10mm. Material: black anodized aluminium

28. 10 Aluminium Post Holders for mounting posts 12 mm, length 100 mm. A slot allows clamping post holders to mounting surface using clamps like 3UTC.

29. 10 Aluminium Post Holders for mounting posts 12 mm, length 150 mm. A slot allows clamping post holders to mounting surface using clamps like 3UTC.

30. 2 XYZ Linear Translation Stage, 15mm travel range in X, Y and Z axis, micrometer drive. Sensitivity: 1 µm; Tracking accuracy: 2 µm; Scale graduation: 10 µm; Load capacity: 5 kg. Weight 1.35 kg.

31. 2 Steel optical rail: length - 470 mm (metric), 42.5 mm wide, M6 mounting holes Lengthwise mounting slots for M6 screws. Suitable for mini steel optical rails system.

32. 2 Steel optical rail: length - 670 mm (metric), 42.5 mm wide, M6 mounting holes Lengthwise mounting slots for M6 screws. Suitable for mini steel optical rails system.

33. 20 Steel Optical Mounting PostsMounting Posts, height 1", dia- 0.5". Imperial holes on the ends: 8-32 and 1/4-20.

34. 20 Steel Optical Mounting Posts Mounting posts, height 2", dia- 0.5". Imperial holes on the ends: 8-32 and 1/4-20.

35. 20 Steel Optical Mounting Posts Mounting posts, height 3", dia- 0.5". Imperial holes on the ends: 8-32 and 1/4-20.

36. 20 Steel Optical Mounting posts, height 4", dia- 0.5". Imperial holes on the ends: 8-32 and 1/4-20.

37.

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI “Physical Science and Engineering”, Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell’ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata “Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall’Unione europea – NextGenerationEU.

20 Steel Optical Mounting posts, height 6", dia- 0.5". Imperial holes on the ends: 8-32 and 1/4-20.

38. 20 Stainless Steel Optical Mounting posts designed for small optical mounts, height 1.5", dia- 0.5".

39. 3 Mirror Mount, Optics diameter 1", 2 screws. Mounting on either of 2 sides, round shaped mounting opening. Fine screw thread: M6x0.25; Tilt range: 9°; Travel range 4 mm; Sensitivity 3 arcsec or 1 µm.

40. 3 Mirror Mount, Optics diameter 1", 3 screws. Mounting on either of 2 sides, round shaped mounting opening. Fine screw thread: M6x0.25; Tilt range: 9°; Travel range 4 mm; Sensitivity 3 arcsec or 1 µm.

41. 3 Mirror Mount, Optics diameter 1", 2 screws. Mirror version, Mounting on either of 2 sides. Fine screw thread: M6x0.25; Tilt range: 9°; Travel range 4 mm; Sensitivity 3 arcsec or 1 µm.

42. 3 Mirror Mount, Optics diameter 1", 3 screws. Mirror version, Mounting on either of 2 sides. Fine screw thread: M6x0.25; Tilt range: 9°; Travel range 4 mm; Sensitivity 3 arcsec or 1 µm.

43. 2 Manual Linear Translation Stage, Travel range 15 mm, Sensitivity 1 µm, Tracking accuracy 2 µm, Scale graduation 10 µm; Load capacity: Horizontal 10 kg, Vertical 5 kg. Weight 0.41 kg

44. 2 Mini Rail System Ball Slide Positioners, Travel range 5 mm, Sensitivity 1µm, Rough XY travel range ±20 mm, Tracking accuracy 2 µm, Reading accuracy 5 µm (half division).
Load capacity: Horizontal 3 kg.

45. 2 Mini Rail System Ball Slide Positioners, Vertical;Travel range 5 mm, Sensitivity 1µm, Rough XY travel range ±20 mm, Tracking accuracy 2 µm, Reading accuracy 5 µm (half division).
Load capacity: Vertical 1 kg.

46. 1 Vertical Translation Stage, Travel range 100 mm, Top and bottom plates parallel 1 mm,
Load capacity 7 kg, Weight 2.72 kg.

47. 5 Metallic Coated Optics Protected Silver R>96% @ 550 nm - IR, Ø25.4, FLAT/FLAT

48. 2 Metallic Coated Optics Protected Silver R>96% @ 550 nm - IR, Ø50.8 x 8, FLAT/FLAT

49. 2 Metallic Coated Optics Protected Silver R>96% @ 550 nm - IR, Ø76.2 x 8, FLAT/FLAT

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI “Physical Science and Engineering”, Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell’ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata “Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall’Unione europea – NextGenerationEU.

50. 1 UVFS Lens kit, 40 lenses, Coating BBAR@350-900 nm: Plano-Convex Lenses (16 pcs.), Biconvex Lenses (12 pcs), Plano-Concave Lenses (6 pcs.), Biconcave Lenses (6 pcs.)

51. 1 Laser Safety System inlcuding shutter

ICS-9-9WAY	*CS-9 9 Way Safety Interlock Control System (NRTL)*
LEDS-ULT-470-L-2W	*LED Ultra sign, Laser Radiation (2W), 470 mm*
IS-MDC-12	*Dual channel Interlock Switch PLe, 2 n/c, 1 n/o*
MAGLOCK	*Maglock, 12 or 24 VDC, 250 Kg, 25 x 250 x 42 mm*
MAGLOCK-IN	*L and Z bracket kit for maglock for inward opening doors*
ICS-KP-23	*Access keypad with override*
PUSH-BUT	*Push button switch, spring return, 1 n/o*
ESTOP-BG-2CO	*Green Emergency Break Glass DPCO contact (no glass)*
ICS-DBS-IC	*Switched Monitored Distribution Box – Interlock*
LEAD-ICS-DBS-IC-OE-3M	*Interlock connector lead 3 m*
LS-20-24	*Laser shutter with monitoring, 24 VDC, max laser power 20W*
LS-20-DM-400-700	*LS-20-24 Mirror, 400-700nm*
BD20-AC	*Beam dump for LS-20, air cooled, 200W*
LS-RS30	*Remote Switch for LS-30 Shutter Range, fixed*
ESTOP-PB-DC	*Emergency Stop Push Button 2NC contact, for ICS-9*
PS-24V-2.5A	*Switch mode power supply, 24 VDC, 60W, 2.5A*
CABLE-2C-LSZH-100	*2 Core Cable LSZH DEFSTAN 100M, 16x0.2, 2.5A*
CABLE-4C-LSZH-100	*4 Core cable LSZH DEFSTAN 100M, 7x0.2mm, 1A*
CABLE-6C-LSZH-100	*6 Core Cable LSZH DEFSTAN 100M, 7X0.mm, 1°*

70. 2 Ø1" Kit, AR 35 pc N-BK7 Plano-/Bi-Convex/Concave Lens Coating: 1050-1620 nm,

Lens Type	Focal Lengths (mm)	Diopters[a]	Included Lens Item Numbers[b]
Plano Convex	25.4, 35, 50, 75, 100, 125, 150, 200, 250, 300, 400, 500, 750, 1000	+39.4, +28.6, +20.0, +13.3, +10.0, +8.0, +6.7, +5.0, +4.0, +3.3, +2.5, +2.0, +1.3, +1.0	LA1951, LA1027, LA1131, LA1608, LA1509, LA1986, LA1433, LA1708, LA1461, LA1172, LA1908, LA1978, LA1464, LA1484
Bi Convex	25.4, 35, 50, 75, 100, 125, 150, 200, 250, 300, 400, 500, 750, 1000	+39.4, +28.6, +20.0, +13.3, +10.0, +8.0, +6.7, +5.0, +4.0,	LB1761, LB1811, LB1471, LB1901, LB1676, LB1904, LB1437, LB1945,

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI "Physical Science and Engineering", Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell'ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata "Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall'Unione europea – NextGenerationEU.

Lens Type	Focal Lengths (mm)	Diopters[a]	Included Lens Item Numbers[b]
		+3.3, +2.5, +2.0, +1.3, +1.0	LB1056, LB1779, LB1391, LB1869, LB1475, LB1409
Plano Concave	-30, -50, -75, -100	-33.3, -20.0, -13.3, -10.0	LC2679, LC1715, LC1582, LC1120
Bi Concave	-30, -50, -75	-33.3, -20.0, -13.3	LD2297, LD1464, LD1170

71.

1 Smart Selection PowerEdge Server, 2U with 2 socket. Chassis with up to 8 x 2.5" SAS/SATA Hard Drives for 1CPU Config, PERC/HBA11. No Trusted Platform Module.
Processor Intel® Xeon® Silver 4210R 2.4G, 10C/20T, 9.6GT/s, 13.75M Cache, Turbo, HT (100W) DDR4-2400. Performance Optimized Memory configuration. Nr 2 Memories 16GB RDIMM, 3200MT/s, Dual Rank. No Operating System. RAID C7, Unconfigured RAID for HDDs or SSDs (Mixed Drive Types Allowed). SATA SSD 480GB SSD SATA Read Intensive 6Gbps 512 2.5in Hot-plug AG Drive, 1 DWPD. Power Saving Dell Active Power Controller. 6 Performance Fans forR740/740XD. PCIe Riser Config 1, 4 x8 slots. Network Daughter Card: Broadcom 5720 Quad Port 1GbE BASE-T, rNDC. PowerEdge 2U Standard Bezel. No Rack Rails or Cable Management Arm. No Internal Optical Drive. NO Database Software. No Systems Documentation, No OpenManage DVD Kitù

72.

2 Digital multi-channel piezo controller, 3 axes, -30 to 130 V, strtain gauge sensors, Sub-D 37 socket, analog inputs.

73.

2 High-dynamicas tip/tilt platform, 35 mrad, strain gauge sensors, D-sub connector, including S-335.X2 centering aid for mirror mounting.

74.

1 Miniature Vertical Z-Axis Motorized Translation Stage,

Kinematics & Feedback information	
Travel Range, mm	6 (1/4")
Resolution in Full Step, µm	1
Resolution in 1/8 Step, µm	0.125
Maximal Speed, mm/s	0.5
Limits Switches	Mechanical (2 pcs on borders)
Switch Polarity	Pushed is Closed
Load & Transmission Information	
Lead Screw Pitch, mm	0.35
Load Capacity (Centrally Placed)	
Horizontal, kg	0.5
Vertical, kg	-
Stepper Motor	F10
Gearbox	16/1
Wedge reduction rate	2:1

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI “Physical Science and Engineering”, Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell’ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata “Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall’Unione europea – NextGenerationEU.

Material & Environment Conditions	
Housing Material	Aluminum
Housing Coating (Finish)	Black Anodizing
Environment Pressure	Normal Atmosphere (10^{-3} Torr on request)
Housing Material	Aluminum

75.
1 Base Plate

76.
5 Universal Platform Mount, two orthogonal angular adjustments 9° range, Sensitivity 3 arcsec, M6×0.25 adjustment screws. 3 fine screws, Mounting through holes for M4(8-32) screws.

77.
1 Aluminium Translation Stage, Travel range 50 mm, Sensitivity 1µm,
Tracking accuracy 2 µm, Reading accuracy 10 µm. Load capacity: Horizontal 40 kg, Vertical 9 kg

78.
3 Ultra Low Profile Two Axis Translation Stage, height 20 mm, Compact X-Y configuration, Travel range 10 mm, Sensitivity 1 um; Tracking accuracy 2 µm; Reading accuracy (1/2) division 5 µm; Load capacity: Horizontal 6 kg, Vertical 3 kg.

79.
10 Aluminium Black anodized Universal Base Plate

80.
3 Base Plate for stages

81.
1 3-axis Motor Controller, Open loop, closed loop, Compatible with Windows XP/Vista/7/8/10/11, Linux, Mac OS, Synchronization I/O
User Friendly XILab Interface, Step Mode Up to 1/256, Step Loss Compensation, Voltage 12-48 Vdc

82.
1 Two-Axis Motorized Rotation & Tilt Stage with Ecoders, Tilt Θy ±2°
Rotation Θz ±2,5°
Resolution in full step 1,25 µm

83.
1 Power supply (36V, 4.44A) For TWO axis box to control Power Cable EU plug

84.
1 Power supply (12V, 1.5A), For one axis box to control Power Cable EU plug

85.
20 steel Universal Fork Clamp, 26 mm (1.02") long slot,
Fixes by M6 (1/4-20) standard cap screws

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI “Physical Science and Engineering”, Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell’ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata “Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall’Unione europea – NextGenerationEU.

86.

1 Water Chiller (1P 220V 50Hz)
Evaporator: 6L; Refrigerant: R-134a;
Max. pump lift: 25M; Max. flow: 15L/min;
Pump power: 0.09kW; Cooling capacity: 0.89kW; Compressor power: 0.49HP; Temperature stability: ±0.1℃
Machine: 58x29x52cm.

87.

2 Multi-Axis Tilt Platform,Tilt Θy: ±2°
Rotation Θz: ±2.5°, Load capacity 15 kg, Weight 1 kg
M6 and M4 mounting holes. Dimensions: 148x92x33mm

88.

2 Screw Kit

description	quantity
standard M6 8 mm deep stainless steel screw	50
standard M6 10 mm deep stainless steel screw	50
standard M6 16 mm deep stainless steel screw	150
standard M6 20 mm deep stainless steel screw	50
stainless steel M6 washers	50
stainless steel hex key	10

89.

2 Screw Kit n.2

description	quantity
standard M4 8 mm deep stainless steel screw	20
standard M4 10 mm deep stainless steel screw	20
standard M4 16 mm deep stainless steel screw	20
standard M4 20 mm deep stainless steel screw	20
standard M6 8 mm deep stainless steel screw	20
standard M6 10 mm deep stainless steel screw	20
standard M6 16 mm deep stainless steel screw	20
standard M6 20 mm deep stainless steel screw	20
stainless steel M4 washers	25
stainless steel M6 washers	25

91.

1 UV Plano-Convex Lens, 25mm Dia. x 50mm FL UV-VIS Coated (250-700nm)
Diameter (mm): 25.00 +0.0/-0.025.
Back Focal Length (mm): 46.00.
Effective Focal Length EFL (mm): 50.00 @ 587.6nm
Coating Specification: Rabs ≤1.0% @ 350 - 450nm, Ravg ≤1.5% @ 250 - 700nm

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI “Physical Science and Engineering”, Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell’ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata “Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall’Unione europea – NextGenerationEU.

Surface Quality: 40-20
Irregularity (P-V) @ 632.8nm: λ/4
Numerical Aperture NA: 0.25
Edge Thickness ET (mm): 2.13
f/#: 2
Damage Threshold, Reference: 3 J/cm2 @ 355nm, 10ns; 5 J/cm2 @ 532nm, 10ns.

92.

1 UV Plano-Convex Lens, 25mm Dia. x 100mm FL UV-VIS Coated (250-700nm)
Diameter (mm): 25.00 +0.0/-0.025
Back Focal Length BFL (mm): 97.40
Effective Focal Length EFL (mm): 100.00 @ 587.6nm
Coating Specification: Rabs ≤1.0% @ 350 - 450nm, Ravg ≤1.5% @ 250 - 700nm
Surface Quality: 40-20
Irregularity (P-V) @ 632.8nm: λ/4
Numerical Aperture NA: 0.13
Edge Thickness ET (mm): 2.05
f/#: 4
Damage Threshold, Reference: 3 J/cm2 @ 355nm, 10ns; 5 J/cm2 @ 532nm, 10ns

93.

1 UV Plano-Concave Lens, 25.0mm Dia. x -50 FL, Uncoated.
Diameter (mm): 25.00 +0.0/-0.025
Numerical Aperture NA: 0.25
Back Focal Length BFL (mm): -51.37
Effective Focal Length EFL (mm): -50.00
Focal Length Specification Wavelength (nm): 587.6
Wavelength Range (nm): 200 - 2200
Surface Quality: 40-20
Irregularity (P-V) @ 632.8nm: λ/4
Edge Thickness ET (mm): 5.52
f/#: 2.00

94.

1 UV Plano-Concave Lens, 25.0mm Dia. x -100 FL, Uncoated.
Diameter (mm): 25.00 +0.0/-0.025
Numerical Aperture NA: 0.13
Back Focal Length BFL (mm): -101.71
Effective Focal Length EFL (mm): -100.00
Focal Length Specification Wavelength (nm): 587.6
Wavelength Range (nm): 200 - 2200
Surface Quality: 40-20
Irregularity (P-V) @ 632.8nm: λ/4
Edge Thickness ET (mm): 4.15
f/#: 4

95.

1 UV Enhanced Aluminum 90° Off-Axis Parabolic Mirror.
Diameter (mm): 6.35 +0.1/-0.0

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI “Physical Science and Engineering”, Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell’ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata “Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall’Unione europea – NextGenerationEU.

Effective Focal Length EFL (mm): 6.35
Radius of Curvature (mm): 6.35
Coating: Enhanced Aluminum (250-700nm)
Coating Specification: Ravg >89% @ 250 - 450nm; Ravg >85% @ 250 - 700nm
Off-Set Angle (°): 90
Surface Figure, RMS: λ/8
Parent Focal Length PFL (mm): 3.175
Surface Roughness (Angstroms): <50 RMS
Surface Quality: 80-50
Reflected Wavefront, RMS: λ/4

96.

1 Large Angle Flat Top Holographic Diffuser Set
Diffusing Angle (°):
A: 30 x 16, Rectangular
B: 60 x 45, Rectangular
C: 11, Square
D: 30, Square
E: 32 x 0, Linear
F: 65 x 0, Linear
G: 21, Circular
H: 43, Circular
Clear Aperture CA (mm): 10 x 10
Dimensions (mm): 87.4 x 66.7
Thickness (mm): 1.59
Transmission (%): >85
Substrate: Polycarbonate
Wavelength Range (nm): 400 – 700

97.

1 Unmounted Ø25 mm Apodizing Reflective ND Filter, OD: 0.04 - 1
Diameter (Unmounted): 25.0 +0.0/-0.25 mm
Substrate: N-BK7
Clear Aperture: >90% Unmounted Diameter
Surface Flatness: <5λ @ 632.8 nm
Surface Quality: 60-40 Scratch-Dig
Parallelism: <3 arcmin
Optical Density @ Edge: 0.04 OD
Transmission @ Edge: 91.2%
Optical Density @ Center: 1.0 OD
Transmission @ Center: 10%

98.

1 Unmounted Ø25 mm Apodizing Reflective ND Filter, OD: 0.04 – 2
Diameter (Unmounted): 25.0 +0.0/-0.25 mm
Substrate: N-BK7
Clear Aperture: >90% Unmounted Diameter
Surface Flatness: <5λ @ 632.8 nm
Surface Quality: 60-40 Scratch-Dig

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI “Physical Science and Engineering”, Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell’ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata “Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall’Unione europea – NextGenerationEU.

Parallelism: <3 arcmin
Optical Density @ Edge: 0.04 OD
Transmission @ Edge: 91.2%
Optical Density @ Center: 2.0 OD
Transmission @ Center: 1%

99.

1 Unmounted Ø25 mm UVFS Reflective ND Filter, OD: 0.3
Substrate Material: UV Fused Silica
Front Surface Coating: Nickel
Spectral Range: 200 - 1200 nm
Optical Density Tolerance @300nm: ±5%
Optic Dimension Tolerance: +0.00 / -0.20 mm
Clear Aperture: >90% of Outer Diameter
Filter Thickness: 1 mm
Surface Flatness @ 633 nm: <2λ
Parallelism: <30 arcsec
Surface Quality: 40-20 Scratch-Dig
Damage Threshold: 0.025 J/cm2 (355 nm, 10 ns, 10 Hz, Ø0.772 mm)

100.

1 Unmounted Ø25 mm UVFS Reflective ND Filter, OD: 0.6
Substrate Material: UV Fused Silica
Front Surface Coating: Nickel
Spectral Range: 200 - 1200 nm
Optical Density Tolerance @300nm: ±5%
Optic Dimension Tolerance: +0.00 / -0.20 mm
Clear Aperture: >90% of Outer Diameter
Filter Thickness: 1 mm
Surface Flatness @ 633 nm: <2λ
Parallelism: <30 arcsec
Surface Quality: 40-20 Scratch-Dig

101.

1 Unmounted Ø25 mm UVFS Reflective ND Filter, OD: 0.9
Substrate Material: UV Fused Silica
Front Surface Coating: Nickel
Spectral Range: 200 - 1200 nm
Optical Density Tolerance @300nm: ±5%
Optic Dimension Tolerance: +0.00 / -0.20 mm
Clear Aperture: >90% of Outer Diameter
Filter Thickness: 1 mm
Surface Flatness @ 633 nm: <2λ
Parallelism: <30 arcsec
Surface Quality: 40-20 Scratch-Dig

102.

1 Unmounted Ø25 mm UVFS Reflective ND Filter, OD: 1.3
Substrate Material: UV Fused Silica

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI "Physical Science and Engineering", Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell'ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata "Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall'Unione europea – NextGenerationEU.

Front Surface Coating: Nickel
Spectral Range: 200 - 1200 nm
Optical Density Tolerance @300nm: ±5%
Optic Dimension Tolerance: +0.00 / -0.20 mm
Clear Aperture: >90% of Outer Diameter
Filter Thickness: 1 mm
Surface Flatness @ 633 nm: <2λ
Parallelism: <30 arcsec
Surface Quality: 40-20 Scratch-Dig

103.

1 Unmounted Ø25 mm UVFS Reflective ND Filter, OD: 1.5
Substrate Material: UV Fused Silica
Front Surface Coating: Nickel
Spectral Range: 200 - 1200 nm
Optical Density Tolerance @300nm: ±5%
Optic Dimension Tolerance: +0.00 / -0.20 mm
Clear Aperture: >90% of Outer Diameter
Filter Thickness: 1 mm
Surface Flatness @ 633 nm: <2λ
Parallelism: <30 arcsec
Surface Quality: 40-20 Scratch-Dig

104.

1 Unmounted Ø25 mm UVFS Reflective ND Filter, OD: 2.0
Substrate Material: UV Fused Silica
Front Surface Coating: Nickel
Spectral Range: 200 - 1200 nm
Optical Density Tolerance @300nm: ±5%
Optic Dimension Tolerance: +0.00 / -0.20 mm
Clear Aperture: >90% of Outer Diameter
Filter Thickness: 1 mm
Surface Flatness @ 633 nm: <2λ
Parallelism: <30 arcsec
Surface Quality: 40-20 Scratch-Dig
Damage Threshold: 0.075 J/cm2 (355 nm, 10 ns, 10 Hz, Ø0.772 mm)

105.

1 Ø1" Mounted Pinhole, 5 ± 1 µm Pinhole Diameter, Steel

Circularity: ≥85%
Foil Thickness: 50 µm
Foil Material: 300 Series Steel, Black-Oxide Conversion Coating
Housing Material: 6061-T6 Aluminum

106.

1 Ø1" Mounted Pinhole, 10 ± 1 µm Pinhole Diameter, Steel
Circularity: ≥85%
Foil Thickness: 50 µm

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI "Physical Science and Engineering", Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell'ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata "Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall'Unione europea – NextGenerationEU.

Foil Material: 300 Series Steel, Black-Oxide Conversion Coating
Housing Material: 6061-T6 Aluminum

107.

1 Ø1" Mounted Pinhole, 20 ± 2 µm Pinhole Diameter, Stainless Steel
Circularity: ≥85%
Foil Thickness: 50 µm
Foil Material: 300 Series Steel, Black-Oxide Conversion Coating
Housing Material: 6061-T6 Aluminum

108.

1 Ø1" Achromatic Doublet, SM1-Threaded Mount, ARC: 400-700 nm
f (mm): 50
WD (mm): 39.9
f_b (mm): 43.4
Design Wavelengths: 486.1 nm, 587.6 nm, 656.3 nm
Reflectance Over AR Coating Range (0° AOI): Ravg < 0.5%
Surface Quality: 40-20 Scratch-Dig
Clear Aperture: >90% of Diameter
Damage Threshold:
Pulsed 0.5 J/cm2 (532 nm, 10 ns Pulse, 10 Hz, Ø0.566 mm)
CW 300 W/cm (532 nm, Ø1.000 mm)
Operating Temperature: -40 °C to 85 °C

109.

1 Ø1" UV-Enhanced Al Reflective Ground Glass Diffuser
Grit: 220
Coating on Grit Side: UV-Enhanced Aluminum
Average Reflectance of Coating (AOI = 0 to 45°): >90% from 250 to 450 nm
Substrate: N-BK7
Diameter: 1" (25.4 mm)
Thickness: 2.0 mm (0.08")
Clear Aperture: >90% Diameter
Parallelism: <3 arcmin

110.

1 Unmounted Square Pattern Engineered Diffuser
Material: Injection Molded ZEONOR
Diffuser Diameter: Ø25.4 mm (Ø1")
Design Wavelength: 400 - 700 nm (Achromatic)
Transmission Spectrum: 380 - 1100 nm
Incident Beam Size: ≥0.5 mm
Divergence (defined for collimated 633 nm incident light):
Flat Intensity Region: 20°
50% of Max Intensity: 27°
Transmission Efficiency: 90%

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI “Physical Science and Engineering”, Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell’ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata “Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall’Unione europea – NextGenerationEU.

GRUPPO 2

111.

1

110mW total power, 25mW in VIS, spectral coverage 450-2400nm, collimated.
Output termination: Collimator
Output power stability (1 hour): <± 1.0 %
Repetition rate: Variable 1 Hz up to minimum 20 kHz
Output pulse width: < 2 ns
Pulse-pulse jitter (standard dev.) [µs]: < 2
Output fiber: Single-mode
Beam diameter (collimated) @532 nm: ≈ 1 mm
Beam diameter (collimated) @1100 nm: ≈ 2 mm
Beam diameter (collimated) @2000 nm: ≈ 3 mm
Beam quality: M2 < 1.1
Polarization: Unpolarized
Beam output: Gaussian, single-mode
Computer Interface: USB
System cooling: Air
Door interlock connector: 2-pin LEMO 0B
Trigger input: standard industrial, galvanically isolated
Operation temperature [°C]: 18 - 30

Progetto dal titolo "STILES – Strengthening the Italian leadership in ELT and SKA" , Codice Identificativo: IR0000034, Area ESFRI “Physical Science and Engineering”, Codice Unico di Progetto: C33C22000640006, ammesso a finanziamento nell’ambito degli "Interventi" previsti dalla "Missione 4", denominata "Istruzione e Ricerca", "Componente 2 denominata ", "Dalla Ricerca alla Impresa" ("M4C2"), "Linea di Investimento 3.1", denominata “Fondo per la realizzazione di un sistema integrato di infrastrutture di ricerca e innovazione" " del "Piano Nazionale di Ripresa e Resilienza" ("PNRR") finanziato dall’Unione europea – NextGenerationEU.