

# NPL's 3 to 5 Year Procurement Plan as on July 24, 2023

NON-CONSUMABLE (Below Rs. 5.00 lakh)		
S.No.	Item Name	Qty.
1	Work station	2
2	KVM	2
3	Managed Switch	2
4	High Speed workstation	1
5	Fabry Perot interferometer & controller, accessories	1
6	Photodetectors	4
7	Coil Winding Machine	1
8	Two stage oil sealed Rotary vacuum pump	2
9	Racks and Mounting systems for measurement units- 04 nos	2

NON - CONSUMABLE ( Above Rs. 5.00 lakh)		
S.No	Item Name	Qty.
1	1. QHRS System Comprising (1) 12T Superconducting magnet (2) variable Temperature insert having 12 pin TO8 (3) provision for VTI (4) Compatible cryogenic temperature controller (5) DCC resistance bridge (6) DRY scroll pump to achieve (7) QHR Devices (i) GaAs/AlGaAsbased & (ii) Graphene based	1
2	Source measuring Units, Current source & nanovoltmeter	1 Each
3	Thermally Stabilized Travelling Resistance Standards (1-1 Mohm)	1 Each (Total 6)
4	PRT Thermometer with digital readout	2
5	High Precision Dual Channel Thermo-Hygrometer/ logger	2
6	Cryogenic Current Comparator (CCC) bridge/electronics for the highest precision measurement of resistance ratios at different levels from 1 Ohm to 1 MOhm (type A uc lower than 10 ppb).	1
7	Turbo molecular pump with backing pump and accessories	2
8	Digital Oscilloscope (for initiating SQUID measurements in the CCC)	1
9	Rubidium frequency Standard	3
10	Time Interval Counter	3
11	GNSS receiver with Antenna & cable	2
12	White Rabbit Len Standalone kit	2
13	Active Hydrogen Maser	1
14	Pulse Distribution Amplifier	2
15	Frequency Distribution Amplifier	2
16	Data Server	1
17	Network Storage Device	1
18	5KVA UPS (1+1)	4
19	ECDL Laser Systems (one laser diode and one laser diode with amplifier) with frequency stabilization control electronics and associated accessories for Primary Frequency Standard	1

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20	Wavelength meter with switch	1
21	RF spectrum analyzer upto 13.7 GHz	1
22	Turbo molecular pump	1
23	Microwave Cavities	2
24	IR Viewer	1
25	CCD Camera	1
26	Power meter for upto 4 W power	1
27	Mixed domain oscilloscope	1
28	Tunable microwave synthesizer	1
29	Fabry-Perot Interferometer	1
30	Regulated DC Power Supplies	4
31	Workstations	2
32	Function generator	2
33	Environment monitors	2
34	Data logger	1
35	Data Acquisition Cards with Labview software	2
36	Shutters	6
37	UHV deposition chamber based sputtering system	1
38	Cryogen-free ultra-low noise cryostat in the temperature range 2-300K equipped with superconducting magnet, dual voltage and current biasing module, capabilities to rf coupling	1
39	AC/DC QHE devices and the electronics associated with them	6
40	High Precision Impedance (R /L/C) standards	4
41	Data Acquisition/PXI Cards	4
42	UPS with Isolation Transformer, 30 kVA	1
43	Cryofree magnet (12/14 T) with adequate inserts and connections and the integrated measuring electronics suitable for AC/DC QHR standard	1
44	JAWS chip Standalone 2V	1
45	Compatible Probe	1
46	Liquid Helium Dewar	1
47	Waveform Generator 30 MHz	1
48	High Speed Arbitrary Waveform Generators	1
49	2 Channel Broadband 50 GHz Modulator Driver/RF Amplifier	1
50	High Speed Counter Control AWG 4-channel isolated, prog. amplifier	1
51	Broadband Digitiser with high sampling rate	1
52	Thermal Transfer Standard	1
53	AC voltmeter	1
54	Cryocooler	1
55	Software license	1
56	Integrated Confocal Raman spectroscopy/micro-Raman Mapping - Multimode AFM system with accessories	1
57	Two wavelength/Dual colour infrared optical pyrometer capable of measuring temperatures $\geq 2000$ OC with interfacing kit	1
58	Throttle valve with controller and accessories	1
59	Electro Optic Modulators	3
60	RF Drives and Amplifiers	3
61	Acousto-optic modulators	4

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62	Vacuum Pumps, gauges & accessories	2
63	Frequency synthesizer/Function generator	4
64	Clock Laser with ULE cavity with accessories	1
65	PMT detector	1
66	CCD/CMOS camera	1
67	Fast Photodiode	1
68	Nominal and small/minor equipment electrical, optical & fiber	1
69	Gaussmeter/Teslameter	1
70	Power/Energy meter	3
71	Optical isolator	4
72	Oscilloscopes	3
73	DC power supplies	2
74	Beam profiler	1
75	Laser and Wavemeter	1
76	Time Tagger	1
77	Electron beam lithography (EBL) equipment	1
78	Inductively coupled plasma reactive ion etching (ICP-RIE) equipment	1
79	Quantum Transport measurement system: Ultra-low noise electronics setup for quantum transport measurements ( Lock-in amplifiers, current preamplifiers, SMUs, DC voltage source, spectrum analyzer, low current measurement unit, nanovoltmeter, temperature controller, ultra-low noise current amplifiers (ULCA) etc.)	1
80	Force comparator with coil*	1
81	Permanent Magnet system*	1
82	Optics, Laser (primary realization option) + Laser Interferometer measurement system	4 sets
83	Vacuum system, Translation Stages, Mechanics*	1
84	Sensors and control electronics	1 Set
85	Precision voltmeters	4
86	Programmable current sources	4
87	FG5 (absolute gravimeter), CG5 (relative gravimeter)	1
88	15 t crane and other accessories.	1 Set
89	PJVS, QHR systems (PJVS Device + Cryostat, QHR cryostat + superconducting magnet) existing measuring electronics can be used	1
90	High precision resistors with air bath	1
91	Branded work station (one) and Branded PC (two)	1
92	Creation of laboratory with precision mounting and environment control system	1
93	Low noise current source	1
94	Nano-voltmeter	1
95	Closed Cycle Refrigerator (CCR, 4.2 K-350 K)	1
96	SPRTs (Capsule and Long-Stem)	2, 2
97	¼ inch Microphones (08 nos) and Loudspeakers (04 nos) 1-100 kHz	4
98	Pre-amplifiers (05 nos)	5
99	Actuator Supply (05 nos)	5
100	Acoustic Analyzer (two channel), 1-100 kHz	1
101	Waveform generator (100 kHz) and DAQ	1
102	Microwave Probes (08 nos) – Specially developed	8

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103	Vector Network Analyzer (up to 40 GHz)	1
104	Fabrication of copper cylindrical resonator, pressure vessel and assembly	1
105	Digital pressure indicator -	2
106	Cartridge Heaters at resonator- pressure vessel and RTDs	2, 2
107	High precision digital thermometer	1
108	10 MHz frequency counter	1
109	Data acquisition IEEE GPIB cables and Labview software and DAQs	1 set
110	Lock-in-amplifier	1
111	LN2 circulator bath	1
112	Low temperature circulating bath (-80 °C)	1
113	T.P. of Argon with realization apparatus	1
114	Furnace for Cylindrical cavity resonator (1000 oC)	1
115	High temperature blackbody fixed points with furnace up to 3000 oC	1
116	Linear Spectral Pyrometer/Filter radiometer	1
117	Vibration free optical table and mounting accessories	2
118	81/2 DMM/ Potentiostat/ Source meter	1
119	(2P-2T Humidity Generator and Dew Point Hygrometer)	1
120	Equipment for Digital SI	4
121	Vacuum-air transfer system (Vacuum chamber/container, pumps, gauges, etc.	1
122	Weighing balances	1
123	Volume/density measurement system	1
124	Standards weights – 1 kg, E0/E1 class	4
125	Standards weights – 1 mg to 50 kg, E0/E1 class	1
126	Roundness machine - non-contact	1
127	Length Measuring Machine	1
128	Laser Interferometer (Pico Meter Distance Measurement.	1
129	CCD/CMoS camera	5
130	Powder X-ray diffractometer	1
131	Environmental monitoring system (data logger)	6
132	Work stations	5
133	Minor equipments (DC Power Supply, Jigs and Fixtures for holding the Si sphere, etc)	1

<b>CONSUMABLE (Below Rs. 5.00 lakh)</b>		
S.No.	Item Name	Qty.
1	Electronic consumables (components, boards, etc)	1
2	RF cables: RG223, RG174	50m each
3	Connectors: SMA for RG 223, BNC for RG174,	20 nos each
4	Adaptors: SMA F to BNC M, N F to BNC M, N F to SMA M, TNC M to N F	10 nos each
5	Optical fiber & consumables	As per Req
6	GNSS signal splitter 1:4	1
7	SMPS 12V	2
8	Network Switch	2
9	IP address pool	1

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10	Other consumables	As per Req
11	Contingency	As per Req
12	AC Power Module	2
13	DC Power Module	1
14	Oplink Module	1
15	SFP Transceiver	5
16	Repeaters	5
17	NUC	1
18	Receiver Module	5
19	Battery	12
20	Low thermal Cables	Three set
21	Mount Rack	1
22	Soldering station and accessories	One
23	Gold pins, ferrite cores etc.	One set
24	Custom designed OHFC plates	Two sets

<b>CONSUMABLE ( Above Rs. 5.00 lakh)</b>		
S.No	Item Name	Qty.
1	Consumables for optical fiber link (electronic components, Optical components, fiber connectors, SFP etc.,)	As per Req
2	TIC Module	2
3	Other Research Expenditure (ORE)	As per Req
4	RF CABLES	One set
5	Precision Adapters	One set
6	SiC wafers	As per Req
7	photoresists/chemicals	As per Req
8	HV/UHV components [fast entry load lock, magnetic transfer arm, view ports, needle valves, flanges, adpters etc.]	As per Req

UPDATED AS ON JUL 24 , 2023

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