

Table S1. Parts list of LSTM

Source	Cat. Number	Qty	Description
Detection unit			
Thorlabs	CXY2	1	60 mm Cage System Translating Lens Mount for Ø2" Optics
Thorlabs	LCP90F	1	60 mm Removable Cage Plate
Thorlabs	SM2A20	1	SM2 - M38 ADAPTER FOR NIKON TUBE LENS
Thorlabs	SM2L30-SM2	2	SM2 Lens Tube, 3" Thread Depth, One Retaining Ring Included
Thorlabs	LCP09	2	60 mm Cage Plate with Ø2.2" Double Bore for SM2 Lens Tube Mounting
Thorlabs	ER10	4	Cage Assembly Rod, 10" Long, Ø6 mm
Thorlabs	SM1A1	1	Adapter with External SM05 Threads and Internal SM1 Threads
Thorlabs	SM2A31	1	Adapter with External C-Mount Threads and Internal SM2 Threads
Hamamatsu	C13440	1	Digital camera
Custom	ObjAdater	1	Custom made Adapter from SM2 to M34 threading
Thorlabs	SM2V10	1	Ø2" Adjustable Lens Tube, 0.81" Travel
Olympus	XIPlan N, 10X	2	Oil immersion Objective
Thorlabs	LCP01B	2	60 mm Cage Mounting Bracket
Thorlabs	RS2	2	Ø1" Pillar Post, 1/4"-20 Taps, L = 2", 8-32 Adapter Included
Thorlabs	TBB0606	2	Large-Area Translation Stage, 6" x 7.66"
Two Illumination units			
Thorlabs	SM2V10	2	Ø2" Adjustable Lens Tube, 0.81" Travel
Custom	ObjAdater	2	Custom made Adapter from SM2 to M34 threading
Olympus	Macro 4x/0.28NA/29.5WD	2	Air Objective
Thorlabs	SM2A20	2	SM2 - M38 ADAPTER FOR NIKON TUBE LENS
Thorlabs	CXY2	2	60 mm Cage System Translating Lens Mount for Ø2" Optics
Thorlabs	LCP09	2	60 mm Cage Plate with Ø2.2" Double Bore for SM2 Lens Tube Mounting
Thorlabs	LCP01B	4	60 mm Cage Mounting Bracket
Thorlabs	RS2	4	Ø1" Pillar Post, 1/4"-20 Taps, L = 2", 8-32 Adapter Included
Thorlabs	TBB0606	4	Large-Area Translation Stage, 6" x 7.66"
Thorlabs	ER05	8	Cage Assembly Rod, 1/2" Long, Ø6 mm
Thorlabs	LCP02	6	30 mm to 60 mm Cage Plate Adapter, 8-32 Tap
Thorlabs	LJ1695RM-A	2	Ø1", N-BK7 Mounted Plano-Convex Round Cyl Lens
Thorlabs	CRM1L	2	Cage Rotation Mount for Ø1" Optics, Double Bored with Setscrew, 8-32 Tap
Thorlabs	CP20S	2	30 mm Cage System Iris, Ø20.0 mm Maximum Aperture
Thorlabs	CP90F	2	30 mm Removable Cage Plate, Front and Back Plate, Internal SM1 Threading
Thorlabs	CXY1	2	30 mm Cage System, XY Translating Lens Mount for Ø1" Optics
Thorlabs	CP12	2	30 mm Cage Plate, Ø1.2" Double Bore for SM1 Lens Tube Mounting
Thorlabs	LCP01	4	60 mm Cage Plate, SM2 Threads, 0.5" Thick, 8-32 Tap (Two SM2RR Retaining Rings Included)

Thorlabs	CLS-SL	2	Scan Lens with Large Field of View, 400 to 750 nm, EFL=70 mm
Thorlabs	ER18	6	Cage Assembly Rod, 18" Long, Ø6 mm
Thorlabs	LCP50S	2	60 mm Cage System Iris, Ø50.0 mm Maximum Aperture
Optotune	EL-16-40-TC-VIS-5D-C	2	Electrically Tunable Lens
Thorlabs	ER4	18	Cage Assembly Rod, 4" Long, Ø6 mm
Thorlabs	VA100C	2	30mm Cage System Adjustable Slit, 8-32 Tap, Imperial Micrometer
Thorlabs	GVS001	2	1D Galvo System, Silver-Coated Mirror, PSU Not Included
Thorlabs	GCM001	2	1D Galvo 30 mm Cage System Mount
Omicron	Custom	2	Collimator with ~10 mm bead diameter output
Omicron	SOLE-6	1	LASER engine with 4 lines: 405, 488, 561, 647 nm
Mounting Base			
Thorlabs	MB1236	1	Aluminum Breadboard 12" x 36" x 1/2", 1/4"-20 Taps
Thorlabs	RS12	4	Ø1" Pillar Post, 1/4"-20 Taps, L = 12", 8-32 Adapter Included
Thorlabs	C1001	4	Post Mounting Clamp for Ø1" Post
Motorized XYZ Stage and sample mounting			
Thorlabs	LNR50S	3	50 mm (1.97") TravelMax Translation Stage, 1/4"-20 Taps
Thorlabs	LNR50P3	1	XY Adapter Plate for LNR50 TravelMax Stages, Imperial Hole Spacings
	LNR50P2	2	Right-Angle Bracket for LNR50 TravelMax Stages, Imperial Threads
Custom	Sample chamber	1	Custom made 3D printed sample chamber
Controls & electronics			
National Instruments	PXIe-PCle8381	1	Control PCIe card for PXI chassis
National Instruments	NI PXIe-1028	1	PXI express chassis
National Instruments	7852R	1	FPGA card
National Instruments	7842R	2	FPGA card
Thorlabs	GPS011	1	Galvo System Linear Power Supply
Thorlabs	LEDD1B	2	T-Cube LED Driver with Trigger Mode, 1200 mA
Thorlabs	BSC203	1	BSC203 - Three-Channel APT™ Benchtop Stepper Motor Controller
Markettech	SOLE-6	1	6 Laser Light Engine with 4 wavelengths
Serversdirect	Custom	1	Custom workstation with Supermicro X10DRHCT Motherboard, 24 TB SSD Hard Disks (EVO 850), 256 GB RAM (Crucial RDIMM DDR4), Quadro K4200 Graphics card.