TABLE S1. OSP component list and costs. The total instrument cost is <$3,500. Laser cut and 3D-printed costs are reflected in material costs.

Key: Blue = optics (O). Gray = Frame (F). Orange = Electronics (E). Green = Laser Cut (L). Pink = 3D Print (P).

#	Vendor	Part Description	Part / Model Number	Unit cost	Number	Line subtotal
O1	Thorlabs	Universal Base Plate, 2.5" x 2.5" x 3/8"	UBP2	$36.47	2	$72.94
O2	Thorlabs	Cage Assembly Rod, 4" Long, Ø6 mm	ER4	$7.10	1	$7.10
O3	Thorlabs	Cage Assembly Rod, 3" Long, Ø6 mm	ER3	$6.60	1	$6.60
O4	Thorlabs	SM1-Threaded 30 mm Cage Plate, 6 mm Thick	CP6S	$19.16	2	$38.32
O5	Thorlabs	Aspheric Condenser Lens, Ø12 mm, f=10.5 mm, NA=0.54, Uncoated	ACL1210U	$18.05	2	$36.10
O6	Thorlabs	SM05 Lens Tube, 0.50" Thread Depth, One Retaining Ring Included	SM05L05	$14.10	3	$42.30
O7	Thorlabs	Adapter with External SM1 Threads and Internal SM05 Threads, Knurled Edge	SM1A6FW	$19.99	2	$39.98
O8	Thorlabs	SM1 Graduated Ring-Actuated Iris Diaphragm (Ø1 - Ø12 mm)	SM1D12C	$103.02	1	$103.02
O9	Thorlabs	SM1 Lens Tube, 2" Thread Depth, One Retaining Ring Included	SM1L20	$16.50	1	$16.50
O10	Thorlabs	LED Socket	8060-2	$9.89	5	$49.45
O11	Thorlabs	SM05-Threaded Mount for TO-18, TO-39, TO-46, or T-1 3/4 LEDs	S05LEDM	$32.64	1	$32.64
O12	Thorlabs	SMA Fiber Adapter Plate with External SM1 (1.035"-40) Thread	SM1SMA	$29.58	2	$59.16
O13	Thorlabs	SM1-Threaded Aluminum Mount for TO-5 Laser Diodes	S1LM05	$36.47	1	$36.47
O14	Thorlabs	LED with a Glass Lens, 430 nm, 8 mW, TO-18	LED430L	$11.73	1	$11.73
O15	Thorlabs	Epoxy-Encased White Light LED, 13.0 mW, 7.5° Half Viewing Angle, Qty. of 5	LEDWE-15	$9.38	1	$9.38
O16	Thorlabs	543 nm, f = 7.86 mm, NA = 0.51 SMA905 Fiber Collimation Pkg.	F240SMA-A	$150.96	1	$150.96
O17	Thorlabs	1/4"-20 Low-Profile Channel Screws (100 Screws/Box)	SH25LP38	$23.66	1	$23.66
O18	Thorlabs	Drop-In T-Nut, 1/4"-20 Tapped Hole	XE25T1	$29.33	1	$29.33
O19	Thorlabs	Si Photodiode, 10 ns Rise Time, 350 - 1100 nm, 3.6 mm x 3.6 mm Active Area	FDS100	$14.08	1	$14.08
O20	Thorlabs	SM05 Lens Tube, 2" Thread Depth, One Retaining Ring Included	SM05L20	$20.60	1	$20.60
O21	Thorlabs	OEM Flange to Internal SM1 Adapter, 10 mm Thread Depth	SM1F1	$19.18	1	$19.18
O22	LED Supply	5mm LED - Blue 470nm 15 Degree Viewing Angle	L1-0-B5TH15-1	$0.47	1	$0.47
O23	LED Supply	5mm LED - Orange 610nm 30 Degree Viewing Angle	L4-0-O5TH30-1	$0.60	1	$0.60
O24	LED Supply	5mm LED - Green 525nm 15 Degree Viewing Angle	L1-0-G5TH15-1	$0.49	1	$0.49
O25	Ocean Optics	STS-VIS Spec (Included fiber)	STS-VIS	$1,000.00	1	$1,000.00
F1	80/20	1.00" X 1.00" T-Slotted Profile - Four Open T-Slots (19 inch, 2x End Tap)	1010	$10.22	5	$51.10
F2	80/20	1.00" X 1.00" T-Slotted Profile - Four Open T-Slots (19 inch, Counter-bore)	1010	$15.32	3	$45.96
F3	80/20	1.00" X 1.00" T-Slotted Profile - Four Open T-Slots (22 inch, 2x End Tap)	1010	$10.91	6	$65.46
F4	80/20	1.00" X 1.00" T-Slotted Profile - Four Open T-Slots (10 inch, 2x End Tap)	1010	$4.25	4	$17.00
F5	80/20	1.00" X 1.00" T-Slotted Profile - Four Open T-Slots (8 inch, 2x End Tap)	1010	$3.79	2	$7.58
F6	80/20	10 Series 3 Way - Squared Corner Connector	4042-Black	$19.21	8	$153.68

F7	80/20	10 Series 4 Hole - Detent Hinge	2071	$14.45	3	$43.35
F8	80/20	10 & 15 Series Magnetic Door Catch	2090	$6.85	1	$6.85
F9	80/20	10 Series 10-32 Short Double Anchor Assembly	3091	$5.25	6	$31.50
F10	80/20	10 Series 2 Hole - Inside Corner Bracket	4119	$2.90	6	$17.40
F11	80/20	1/4-20 x .500" Button Head Socket Cap Screw (BHSCS)	3061	$0.23	22	$5.06
F12	80/20	1/4-20 Slide-in Economy T-Nut - Centered Thread	3382	$0.21	20	$4.20
F13	80/20	10 & 25 Series 10-32 Standard Drop-in T-Nut	14162	$0.68	200	$136.00
F14	80/20	10 Series 90 Degree Structural Pivot Nub	4188	$4.60	1	$4.60
F15	80/20	1/4-20 x 1.000" Low Head Socket Cap Screw (LHSCS)	3017	$0.53	28	$14.84
F16	80/20	Steel Door Handle	2070	$4.45	2	$8.90
F17	80/20	8-32 Double Slide-in Economy T-Nut	3281	$0.69	4	$2.76
F18	80/20	10 Series Single-Keyed UniBearing™ Pad	6705	$2.05	9	$18.45
F19	McMaster-Carr	Passivated 18-8 Stainless Steel, M4 x 0.70 mm Thread, 10mm Long (100 pack)	92095A190	$9.05	2	$18.10
F20	McMaster-Carr	Scratch-Resistant Acrylic - Black, 12" x 24" x 1/8"	8505K742	$14.75	6	$88.50
F21	McMaster-Carr	Scratch-Resistant Acrylic - Black, 12" x 24" x 1/4"	8505K755	$19.93	2	$39.86
F22	McMaster-Carr	Medium-Strength Steel Hex Nut (100 pack)	95462A029	$4.40	1	$4.40
F23	McMaster-Carr	Button Head Hex Drive Screw, Passivated 18-8 Stainless Steel, M3 x 0.50 mm Thread, 16mm Long (100 pack)	92095A184	$8.85	1	$8.85
F24	McMaster-Carr	Zinc-Plated Steel Hex Nut, Medium-Strength, Class 8, M2.5 x 0.45 mm Thread (100 pack)	90591A270	$2.22	1	$2.22
F25	McMaster-Carr	Zinc-Plated Steel Hex Nut, Medium-Strength, Class 8, M4 x 0.7 mm Thread (100 pack)	90591A255	$2.35	1	$2.35
F26	McMaster-Carr	Button Head Hex Drive Screw, Passivated 18-8 Stainless Steel, M4 x 0.70 mm Thread, 14mm Long (50 pack)	92095A193	$8.16	1	$8.16
F27	McMaster-Carr	High-Strength Steel Nylon-Insert Locknut, Class 10, Zinc-Plated, M4 x 0.7 mm Thread (10 pack)	94645A101	$10.62	1	$10.62
F28	McMaster-Carr	18-8 Stainless Steel Hex Nut, 4-40 Thread Size (100 pack)	91841A005	$2.91	1	$2.91
F29	McMaster-Carr	18-8 Stainless Steel Button Head Hex Drive Screw, 4-40 Thread Size, 3/4" Long (100 pack)	92949A113	$4.03	1	$4.03
F30	McMaster-Carr	Passivated 18-8 Stainless Steel Pan Head Phillips Screws, M4 x 0.7mm Thread, 25mm Long (100 pack)	92000A230	$10.34	1	$10.34
F31	McMaster-Carr	Button Head Hex Drive Screw, Passivated 18-8 Stainless Steel, M2.5 x 0.45 mm Thread, 10mm Long (25 pack)	92095A460	$8.51	1	$8.51
F32	McMaster-Carr	18-8 Stainless Steel Button Head Hex Drive Screw, 4-40 Thread Size, 1/4" Long (100 pack)	92949A106	$2.87	1	$2.87
F33	McMaster-Carr	18-8 Stainless Steel Pan Head Slotted Screws, 2-56 Thread Size, 3/8" Long	91792A079	$4.33	1	$4.33
F34	McMaster-Carr	Passivated 18-8 Stainless Steel Phillips Flat Head Screw, M3 x 0.5 mm Thread, 5 mm Long (100 pack)	92010A114	$3.92	1	$3.92

F35	Amazon	Hilitchi 250-Pcs M2 / M3 /M4 Female Thread Brass Knurled Threaded Insert Embedment Nuts Assortment Kit	ASIN: B0784VYCYY	$19.88	1	$19.88
F36	Amazon	Neiko 50456A Spring Assortment Kit for Repairs, Steel Zinc Plated | 200-Piece Set.	ASIN: B000K7M36W	$8.49	1	$8.49
F37	MakerBot	True Black PLA Large Spool / 1.75mm / 1.8mm Filament	--	$48.00	1	$48.00
E1	Actuonix	Linear Actuator Control Board	LAC	$40.00	2	$80.00
E2	Actuonix	L16-P Linear Actuator with Feedback (140mm Stroke Length, 63:1 Gear Ratio)	L16-P	$80.00	2	$160.00
E3	Arduino	Arduino-UNO	A000066	$22.00	1	$22.00
E4	Adafruit	Raspberry Pi 3 - Model B+ - 1.4GHz Cortex-A53 with 1GB RAM	Website: 3775	$35.00	1	$35.00
E5	Raspberry-Pi	Raspberry Pi Touch Display	Touch Display	$59.99	1	$59.99
E6	Amazon	Case for the Official Raspberry Pi 7" Touchscreen Display - Adjustable angle	ASIN: B01HV97F64	$27.99	1	$27.99
E7	Amazon	LEDMO Power Supply, Transformers,LED Adapter, 12V, 5A Max	ASIN: B01461MOGQ	$10.99	1	$10.99
E8	Amazon	IDC Serial to Panel Mount Serial Cable (PNL9M16)	ASIN: B0067DB6RU; OEM: PNL9M16	$6.27	1	$6.27
E9	Amazon	Raspberry Pi 3 Model B Power Charger 5V 2.5A Power Adapter Micro Cable	ASIN: B07BKSLGYX	$8.55	2	$17.10
E10	Amazon	USB3.0 Coupler Female to Female Adapter	ASIN: B0B:C0J4NMTMQ	$7.99	1	$7.99
E11	Amazon	AmazonBasics 4-Port USB 2.0 Ultra-Mini Hub	ASIN: B003M0NURK	$6.99	1	$6.99
E12	Amazon	JST Conenctor Kit	ASIN: B0731MZCGF	$13.87	1	$13.87
E13	Amazon	Pc Accessories 50-PACK IDC 2X3 6 Pins Dual Row Sockets for Flat Ribbon Cable, 6P 2.54mm FC Female Connectors	ASIN: B00T9BJGRE	$12.95	1	$12.95
E14	Amazon	Case for The Official Raspberry Pi 7" Touchscreen Display - Adjustable Angle	ASIN: B01HV97F64	$24.99	1	$24.99
E15	Mouser	IRF520NPBF - Mosfet	IRF520NPBF	$0.98	6	$5.88
E16	Sparkfun	Voltage Regulator - 5V - STMicroelectronics L7805CV	COM-00107; OEM: L7805CV	$0.95	1	$0.95
E17	Sparkfun	2x3 Pin Shrouded Header	PRT-10877	$1.50	4	$6.00
E18	Sparkfun	2x5 Pin Shrouded Header	PRT-08506	$1.50	1	$1.50
E19	Sparkfun	Rocker Switch - SPST (right-angle)	COM-08837	$0.95	1	$0.95
E20	Sparkfun	DC Barrel Jack Adapter - Female	PRT-10288	$2.95	1	$2.95
E21	Sparkfun	Break Away Headers - Straight (40 count)	PRT-00116	$1.50	2	$3.00
E22	Sparkfun	Photon Stackable Header - 12 Pin	PRT-14322	$0.50	2	$1.00
E23	Sparkfun	Screw Terminals 3.5mm Pitch (2-Pin)	PRT-08084	$0.95	2	$1.90
E24	Mouser	Various Resistors (1kOhm, 330Ohm, 100MOhm)	FMP200JR-52-1K	$0.20	15	$3.00
E25	Mouser	.1uF Capacitor	FA24NP02E103JNU06	$0.61	1	$0.61
E26	4PCB	Custom Made PCBs - Main Power Board	--	$47.51	1	$47.51
E27	4PCB	Custom Made PCBs - Power-switch Board	--	$24.56	1	$24.56
E28	4PCB	Custom Made PCBs - LED Circuit	--	$26.63	1	$26.63
E29	4PCB	Custom Made PCBs - Photodiode Circuit	--	$25.24	1	$25.24
L1	Laser Cut	Part #L1 - Front Floor	--	--	--	--

L2	Laser Cut	Part #L2 - Back Floor	--	--	--	--
L3	Laser Cut	Part #L3 - Front Panel	--	--	--	--
L4	Laser Cut	Part #L4 - Back Panel	--	--	--	--
L5	Laser Cut	Part #L5 - Right Panel	--	--	--	--
L6	Laser Cut	Part #L6 - Right Panel Door	--	--	--	--
L7	Laser Cut	Part #L7 - Front Panel Door	--	--	--	--
L8	Laser Cut	Part #L8 - Front Top Panel	--	--	--	--
L9	Laser Cut	Part #L9 - Back Top Panel	--	--	--	--
L10	Laser Cut	Part #L10 - Y-Axis Motor Floor	--	--	--	--
L11	Laser Cut	Part #L11 - Primary Electronics Mount	--	--	--	--
L12	Laser Cut	Part #L12 - Detector Wall Mount	--	--	--	--
L13	Laser Cut	Part #L13 - LAC Board Panel Mount	--	--	--	--
L14	Laser Cut	Part #L14 - LAC Alignment Frame	--	--	--	--
L15	Laser Cut	Part #L15 - External Device Plate	--	--	--	--
L16	Laser Cut	Part #L16 - Top Optics LED Insert Tab	--	--	--	--
L17	Laser Cut	Part #L17 - Top Optics LED Cage Aligner	--	--	--	--
L18	Laser Cut	Part #L18 - 24-Well Calibration Lid	--	--	--	--
L19	Laser Cut	Part #L19 - 96-Well Calibration Lid	--	--	--	--
L20	Laser Cut	Part #L20 - Left Panel	--	--	--	--
P1	3D Print	Part #P1 - X-Axis Motor Holder	--	--	--	--
P2	3D Print	Part #P2 - Y-Axis Motor Tab	--	--	--	--
P3	3D Print	Part #P3 - Plate Holder	--	--	--	--
P4	3D Print	Part #P4 - PCB Stability Columns	--	--	--	--
P5	3D Print	Part #P5 - Excitation LED Mount	--	--	--	--
P6	3D Print	Part #P6 - Top Auxiliary Plug	--	--	--	--
P7	3D Print	Part #P7 - Wire Holder	--	--	--	--
	Amazon	Alternative to #P7: Adhesive Cable Clips	ASIN: B01HR9VS4I	$6.39	1	$6.39
P8	3D Print	Part #P8 - 24-Well Calibration Lid Plug	--	--	--	--
P9	3D Print	Part #P9 - 96-Well Calibration Lid Plug	--	--	--	--
P10	3D Print	Part #P10 - X-Motor Stabilizer	--	--	--	--
					TOTAL	$3,396.29