

Optical Stochastic Cooling (OSC)

ID	% Work Complete	Task Name	Cost	Duration	Work	Start	Finish	Predecessors	2019-2025																																															
									19 Jun	Qtr 3, 2019 Jul	Qtr 4, 2019 Aug	Qtr 1, 2020 Sep	Qtr 1, 2020 Oct	Qtr 2, 2020 Nov	Qtr 3, 2020 Dec	Qtr 1, 2021 Jan	Qtr 2, 2021 Feb	Qtr 3, 2021 Mar	Qtr 4, 2021 Apr	Qtr 1, 2022 May	Qtr 2, 2022 Jun	Qtr 3, 2022 Jul	Qtr 4, 2022 Aug	Qtr 1, 2023 Sep	Qtr 2, 2023 Oct	Qtr 3, 2023 Nov	Qtr 4, 2023 Dec	Qtr 1, 2024 Jan	Qtr 2, 2024 Feb	Qtr 3, 2024 Mar	Qtr 4, 2024 Apr	Qtr 1, 2025 May	Qtr 2, 2025 Jun	Qtr 3, 2025 Jul	Qtr 4, 2025 Aug	Qtr 1, 2026 Sep	Qtr 2, 2026 Oct	Qtr 3, 2026 Nov	Qtr 4, 2026 Dec	Qtr 1, 2027 Jan	Qtr 2, 2027 Feb	Qtr 3, 2027 Mar	Qtr 4, 2027 Apr	Qtr 1, 2028 May	Qtr 2, 2028 Jun	Qtr 3, 2028 Jul	Qtr 4, 2028 Aug	Qtr 1, 2029 Sep	Qtr 2, 2029 Oct	Qtr 3, 2029 Nov	Qtr 4, 2029 Dec					
0	4%	Optical Stochastic Cooling (OSC)	\$789,743.40	388 days	10,854.7 hrs	Mon 7/15/19	Wed 1/27/21		[Gantt bar for OSC project]																																															
1	22%	Project Management	\$22,841.60	332 days	265.6 hrs	Mon 7/15/19	Fri 11/6/20		CLASSE Tech Manager (FAB)[100%]																																															
2	15%	R&D Helical Undulator Prototype	\$119,816.80	133 days	2,332.7 hrs	Mon 7/15/19	Wed 1/29/20		[Gantt bar for R&D Helical Undulator Prototype]																																															
3	100%	Design/Develop tooling, alum blank	\$4,520.00	10 days	100 hrs	Mon 7/15/19	Fri 7/26/19		CLASSE Engineer RSS-3 (FAB)[50%], Machinist (FAB)[75%]																																															
4	100%	4-th axis CNC alum blank (first article helix)	\$1,440.00	3 days	36 hrs	Mon 7/29/19	Wed 7/31/19	3	Machinist (FAB)[150%]																																															
5	100%	Analyze/brainstorm first article helix	\$1,168.00	10 days	24 hrs	Thu 8/1/19	Wed 8/14/19	4	CLASSE Engineer RSS-3 (FAB)[20%], Machinist (FAB)[10%]																																															
6	100%	Design/Develop optimized tooling for small dia helix	\$2,440.00	10 days	48 hrs	Thu 8/15/19	Wed 8/28/19	5	CLASSE Engineer RSS-3 (FAB)[50%], Machinist (FAB)[10%]																																															
7	100%	4-th axis CNC 2 pieces from alum	\$0.00	0 days	0 hrs	Wed 8/28/19	Wed 8/28/19	6	8/28																																															
8	100%	Analyze/brainstorm optimized helical pieces	\$0.00	0 days	0 hrs	Wed 8/28/19	Wed 8/28/19	7	8/28																																															
9	100%	Decision on current methods/processes for poles	\$0.00	0 days	0 hrs	Wed 8/28/19	Wed 8/28/19	8	8/28																																															
10	100%	Final design implementations	\$1,696.00	20 days	32 hrs	Thu 8/29/19	Thu 9/26/19	9	CLASSE Engineer RSS-3 (FAB)[20%]																																															
11	25%	4-th axis CNC 10 helical pieces (1005 stl) for prototype (incl tooling)	\$13,900.00	30 days	347.5 hrs	Fri 9/27/19	Thu 11/7/19	10	Machinist (FAB)[150%]																																															
12	10%	Design/develop assembly tooling, cradles etc	\$5,580.00	15 days	120 hrs	Fri 9/27/19	Thu 10/17/19	10	CLASSE Engineer RSS-3 (FAB)[50%], Machinist (FAB)[50%]																																															
13	0%	Fabricate assembly tooling, yokes, cradels etc	\$12,000.00	15 days	120 hrs	Fri 10/18/19	Thu 11/7/19	12	Vendor (Machine Shop)																																															
14	0%	Order/receive conductor	\$2,328.80	15 days	7.2 hrs	Thu 8/29/19	Thu 9/19/19	9	CLASSE Procurement[2%], Copper Conductor (Prototype)[1], CLASSE Engineer RSS-3 (FAB)[2%], Electrical Tech-5 (FAB)[2%]																																															
15	0%	Design/Develop coil tooling and processes	\$9,320.00	20 days	200 hrs	Tue 9/3/19	Mon 9/30/19		CLASSE Engineer RSS-3 (FAB)[25%], Electrical Tech-3 (FAB)[50%], Mechanical Tech-5 (FAB)[50%]																																															
16	0%	Assemble undulator magnet prototype (pole/core)	\$6,820.00	10 days	148 hrs	Fri 11/8/19	Thu 11/21/19	11,13	CLASSE Engineer RSS-3 (FAB)[25%], Mechanical Tech-5 (FAB)[80%], Electrical Tech-5 (FAB)[80%]																																															
17	0%	Wind coils (incl utility terminations)	\$27,426.00	35 days	602 hrs	Fri 11/22/19	Wed 1/22/20	16,15	CLASSE Engineer RSS-3 (FAB)[15%], Electrical Tech-5 (FAB), Mechanical Tech-5 (FAB)																																															
18	0%	Design/fab tooling to measure/test Undulator	\$14,298.00	15 days	288 hrs	Fri 11/22/19	Mon 12/16/19	17,55	CLASSE Engineer RSS-3 (FAB)[75%], CLASSE Scientist (FAB)[15%], Mechanical Tech-5 (FAB)[50%], Electrical Tech-5 (FAB)[50%], Machinist (FAB)[50%]																																															
19	0%	Helical Undulator Field Studies (what/how to measure?)	\$11,640.00	15 days	180 hrs	Tue 12/17/19	Tue 1/14/20	16,18	Electrical Tech-5 (FAB)[50%], CLASSE Scientist (FAB)[50%], CLASSE Engineer RSS-3 (FAB)[50%]																																															
20	0%	Electronics Shop Study (what/how to measure?)	\$5,240.00	10 days	80 hrs	Wed 1/15/20	Wed 1/29/20	19	CLASSE Tech Manager (FAB)[50%], Electrical Tech-5 (FAB)[50%]																																															
21																																																								
22	0%	Production Helical Undulators (x2 @ 4.5 m)	\$647,085.00	310 days	8,256.4 hrs	Fri 11/1/19	Wed 1/27/21		[Gantt bar for Production Helical Undulators]																																															
23	0%	Magnet and Assembly Fixture Fabrication	\$215,546.60	120 days	1,378 hrs	Thu 1/30/20	Fri 7/17/20		[Gantt bar for Magnet and Assembly Fixture Fabrication]																																															
24	0%	RFP material/fab for production pole pieces (56x2+spares)	\$16,200.00	60 days	19.2 hrs	Thu 1/30/20	Wed 4/22/20	19,20	CLASSE Tech Manager (FAB)[2%], CLASSE Procurement[2%], Magnet Steel for poles[1]																																															
25	0%	Helical pole fabrication (QTY = 125 incl spares)	\$92,683.00	60 days	0 hrs	Thu 4/23/20	Fri 7/17/20	24	Coursier Machine/Tool - Poles[1]																																															
26	0%	Design/develop assembly tooling, yokes, cradles etc	\$13,760.00	20 days	240 hrs	Thu 1/30/20	Wed 2/26/20	20	Electrical Tech-5 (R&D)[50%], CLASSE Engineer RSS-3 (FAB)[75%], Mechanical Tech-5 (FAB)[50%]																																															
27	0%	RFP material/fab for assembly tooling, yokes cradles etc	\$1,500.00	15 days	24 hrs	Thu 2/27/20	Wed 3/18/20	26	CLASSE Tech Manager (FAB)[10%], CLASSE Procurement[10%]																																															
28	0%	Fabricate/procure assembly tooling, yokes, cradles etc	\$32,000.00	40 days	320 hrs	Thu 3/19/20	Wed 5/13/20	27	Vendor (Machine Shop)																																															
29	0%	Design/develop undulator support structures	\$11,550.00	25 days	250 hrs	Thu 1/30/20	Wed 3/4/20	20	CLASSE Engineer RSS-3 (FAB)[75%], Design-Drafting (FAB)[50%]																																															
30	0%	RFP undulator support structures	\$1,500.00	15 days	24 hrs	Thu 3/5/20	Wed 3/25/20	29	CLASSE Tech Manager (FAB)[10%], CLASSE Procurement[10%]																																															
31	0%	Fabricate/weld/assemble support structures	\$16,000.00	20 days	160 hrs	Thu 3/26/20	Wed 4/22/20	30	Vendor (Machine Shop)																																															
32	0%	Design/develop production coil tooling and processes	\$14,816.00	20 days	328 hrs	Thu 1/30/20	Wed 2/26/20	20	CLASSE Engineer RSS-3 (FAB)[25%], Electrical Tech-5 (FAB)[80%], Machinist (FAB)[25%], Mechanical Tech-5 (FAB)[80%]																																															
33	0%	Order/receive conductor	\$15,537.60	40 days	12.8 hrs	Thu 1/30/20	Wed 3/25/20	20	CLASSE Procurement[2%], Electrical Tech-5 (FAB)[2%], Copper Conductor (Production)[1]																																															
34																																																								
35	0%	Magnet Assembly	\$73,410.00	96 days	1,570 hrs	Fri 6/19/20	Tue 11/3/20		[Gantt bar for Magnet Assembly]																																															
36	0%	Receive Partial Order Machined Parts to Begin Assembly of First Undulator	\$0.00	1 day	0 hrs	Fri 6/19/20	Fri 6/19/20	25,55+40 days,28	6/19																																															
37	0%	Assemble Undulator #1 (incl coil winding)	\$20,650.00	25 days	450 hrs	Mon 6/22/20	Mon 7/27/20	36,28,55	CLASSE Engineer RSS-3 (FAB)[25%], Electrical Tech-5 (FAB), Mechanical Tech-5 (FAB)																																															
38	0%	Terminate utilities Undulator #1	\$14,400.00	20 days	320 hrs	Tue 7/28/20	Mon 8/24/20	37	Electrical Tech-5 (FAB), Mechanical Tech-5 (FAB)																																															
39	0%	Test Undulator #1	\$3,720.00	5 days	60 hrs	Tue 8/25/20	Mon 8/31/20	38	Electrical Tech-5 (FAB), CLASSE Scientist (FAB)[50%]																																															
40	0%	Assemble Undulator #2 (incl coil winding)	\$16,520.00	20 days	360 hrs	Tue 9/1/20	Tue 9/29/20	25,28,55,39	CLASSE Engineer RSS-3 (FAB)[25%], Electrical Tech-5 (FAB), Mechanical Tech-5 (FAB)																																															
41	0%	Terminate Utilities Undulator #2	\$14,400.00	20 days	320 hrs	Wed 9/30/20	Tue 10/27/20	40	Electrical Tech-5 (FAB), Mechanical Tech-5 (FAB)																																															
42	0%	Test Undulator #2	\$3,720.00	5 days	60 hrs	Wed 10/28/20	Tue 11/3/20	41	Electrical Tech-5 (FAB), CLASSE Scientist (FAB)[50%]																																															
43																																																								
44	0%	Vacuum System in CESR L3 (Priorities?)	\$262,508.40	125 days	3,288.4 hrs	Fri 11/1/19	Wed 5/6/20		[Gantt bar for Vacuum System in CESR L3]																																															
45	0%	Design	\$114,614.40	105 days	1,814.4 hrs	Fri 11/1/19	Wed 4/8/20		[Gantt bar for Design]																																															
46	0%	B44E/W Vac Chamber	\$24,886.40	35 days	442.4 hrs	Wed 1/15/20	Wed 3/4/20	47	CLASSE Engineer RSS-3 (FAB), CLASSE Scientist (FAB)[25%], Design-Drafting (FAB)[33%]																																															
47	0%	B46E/W Vac Chamber	\$31,996.80	45 days	568.8 hrs	Fri 11/1/19	Tue 1/14/20		CLASSE Engineer RSS-3 (FAB), CLASSE Scientist (FAB)[25%], Design-Drafting (FAB)[33%]																																															
48	0%	Drift Pipe w/Optics	\$17,776.00	25 days	316 hrs	Thu 3/5/20	Wed 4/8/20	46,47,49	CLASSE Engineer RSS-3 (FAB), CLASSE Scientist (FAB)[25%], Design-Drafting (FAB)[33%]																																															
49	0%	Undulator Vac Chamber (captured/required for und assy)	\$39,955.20	30 days	487.2 hrs	Fri 11/1/19	Mon 12/16/19		CLASSE Scientist (FAB)[150%], CLASSE Engineer RSS-3 (FAB)[20%], Design-Drafting (FAB)[33%]																																															
50																																																								
51	0%	Fab	\$97,894.00	95 days	1,474 hrs	Tue 12/17/19	Wed 5/6/20		[Gantt bar for Fab]																																															
52	0%	B44E/W Vac Chamber (x2) Incl weld/bake etc	\$35,984.00	40 days	416 hrs	Thu 3/5/20	Wed 4/29/20	46	Vendor (Machine Shop), Vacuum Tech-5 (FAB)[15%], Welder-Vacuum RSS-1 (FAB)[15%]																																															
53	0%	B46E/W Vac Chamber (x2) Incl weld/bake etc	\$35,984.00	40 days	416 hrs	Wed 1/15/20	Wed 3/11/20	47	Vendor (Machine Shop), Vacuum Tech-5 (FAB)[15%], Welder-Vacuum RSS-1 (FAB)[15%]																																															
54	0%	Drift Pipe w/Optics Incl weld/bake etc	\$8,440.00	20 days	208 hrs	Thu 4/9/20	Wed 5/6/20	48	Machinist (FAB), Vacuum Tech-5 (FAB)[15%], Welder-Structural[15%]																																															
55	0%	Undulator Vac Chamber x2 (captured/required for und assy)	\$17,486.00	35 days	434 hrs	Tue 12/17/19	Wed 2/12/20	49	Machinist (FAB)[125%], Vacuum Tech-5 (FAB)[15%], Welder-Vacuum RSS-1 (FAB)[15%]																																															
56																																																								
57	0%	Procurement (Currently a guess as params aren't known)	\$50,000.00	1 day	0 hrs	Thu 3/5/20	Thu 3/5/20		3/5																																															
58	0%	Optics, Windows, ...	\$25,000.00	1 day	0 hrs	Thu 3/5/20	Thu 3/5/20	46,47,49	3/5																																															
59	0%	Pumps, Gauges, Valves, Flanges, NEG's	\$25,000.00	1 day	0 hrs	Thu 3/5/20	Thu 3/5/20	46,47,49	3/5																																															
60																																																								
61	0%	Summer 2020 Down	\$58,452.00	71 days	1,236 hrs	Mon 6/29/20	Wed 10/7/20		[Gantt bar for Summer 2020 Down]																																															
62	0%	44EW and 45EW Chamber Installation	\$58,452.00	30 days	1,236 hrs	Mon 6/29/20	Mon 8/10/20	46,47,48,49	Rigger (FAB)[25%], Vacuum Tech-5 (FAB)[50%], Survey Team (FAB)[20%], Mechanical Tech-5 (FAB)[200%], Electrical Tech-5 (FAB)[200%], CLASSE Scientist (FAB)[20%]																																															
63																																																								
64	0%	Winter Down	\$37,168.00	27 days	784 hrs	Mon 12/21/20	Wed 1/27/21		[Gantt bar for Winter Down]																																															
65	0%	Undulator Magnets/Chambers Installation	\$37,168.00	20 days	784 hrs	Mon 12/21/20	Mon 1/18/21		Rigger (FAB)[25%], Vacuum Tech-5 (FAB)[25%], Survey Team (FAB)[20%], Mechanical Tech-5 (FAB)[200%], Electrical Tech-5 (FAB)[200%], CLASSE Scientist (FAB)[20%]																																															