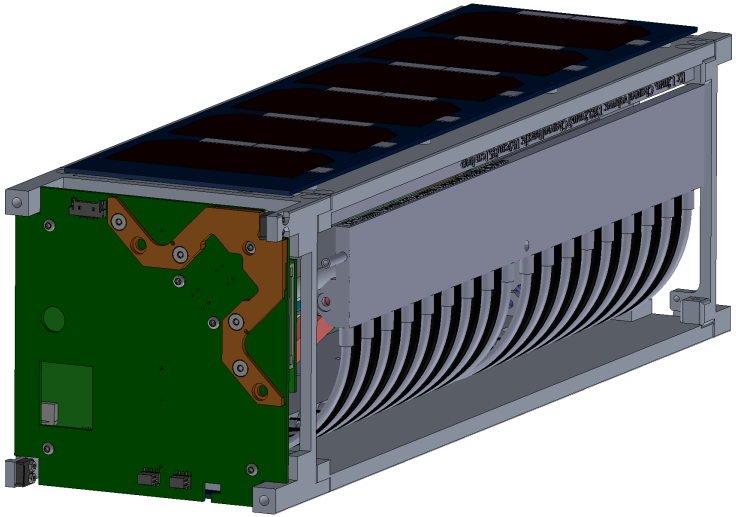
AMDROHPSat

Mission overview

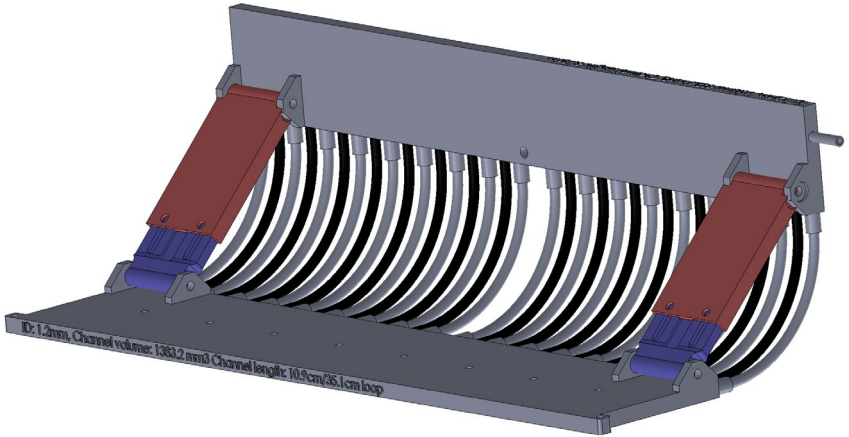
CubeSat Developers Workshop 2025

AMDROHPSat Overview

Integrated 3U CubeSat
(AMDROHPSat)



The Radiator
(AMDROHP)



AMDROHP – Additivley Manufactured Deployable Radiator with Oscillating Heat Pipes

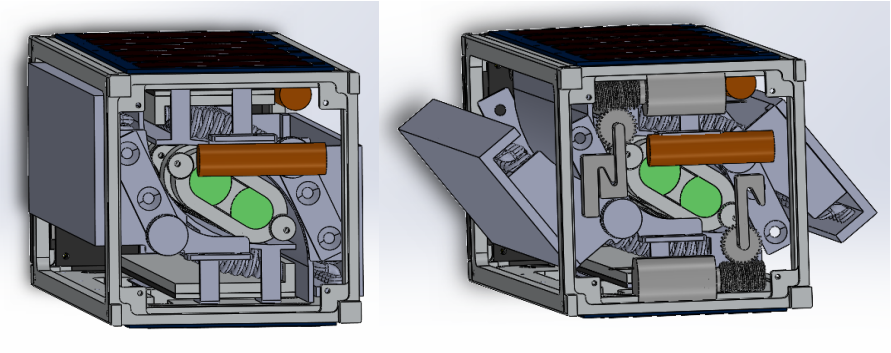
AMDROHPSat Overview

- Demonstrate 50 Watts of total heat dissipation in orbit
- Demonstrate effective conductance of 5000 W/m-K across flexible joint
- Explore OHP use in orbit
- Launch ready in early 2027

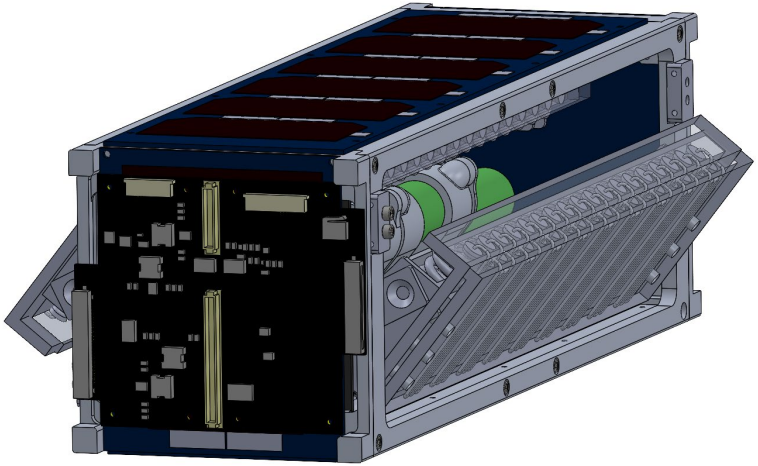
Experiment	Heater Wattage (OHP 1)		Heater Wattage (OHP 2)		Time	Energy	Heat Flux
Number	1	2	3	4	Minutes	W-Hr	W/m^2
1	5.00	5.00	0.00	0.00	20	3.33	1105
2	7.50	7.50	0.00	0.00	20	5.00	1660
3	10.00	10.00	0.00	0.00	20	6.67	2210
4	12.50	12.50	0.00	0.00	20	8.33	2760
5	0.00	0.00	5.00	5.00	20	3.33	1100
6	0.00	0.00	7.50	7.50	20	5.00	1660
7	0.00	0.00	10.00	10.00	20	6.67	2210
8	0.00	0.00	12.50	12.50	20	8.33	2760
9	5.00	5.00	5.00	5.00	20	6.67	2210
9	7.50	7.50	7.50	7.50	20	10.00	3320
10	10.00	10.00	10.00	10.00	20	13.33	4420
11	12.50	12.50	12.50	12.50	20	16.67	5530

Experiment matrix describing planned tests of AMDROHP in orbit

AMDROHPSat History

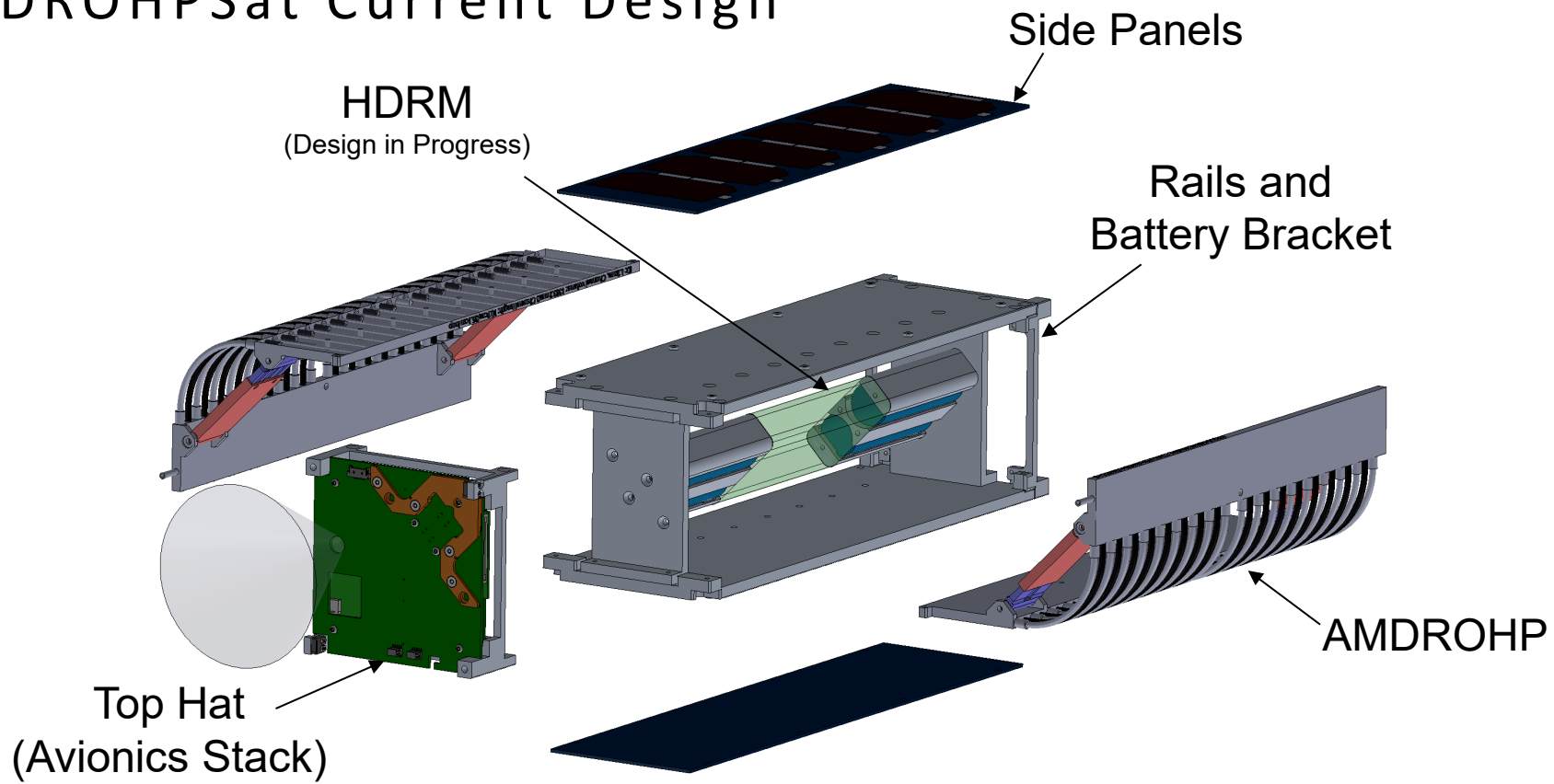


Early concept of AMDROHPSat in stowed (left) and deployed (right) states



Previous version of AMDROHPSat with spring-deployed radiators

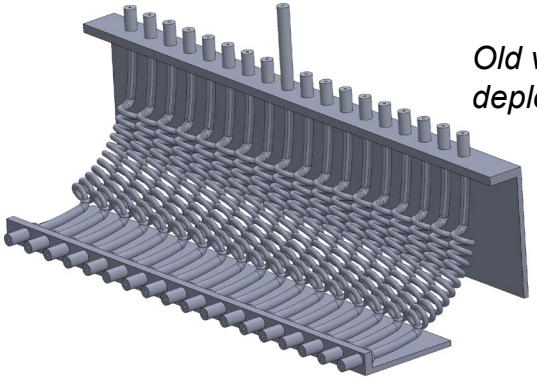
AMDROHPSat Current Design



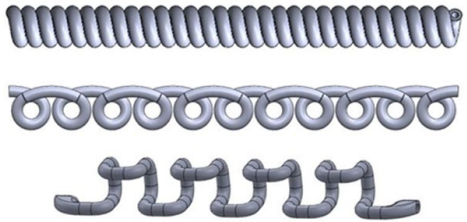
AMDROHPSat exploded view

AMDROHP History

Compliant Deployment Mechanism

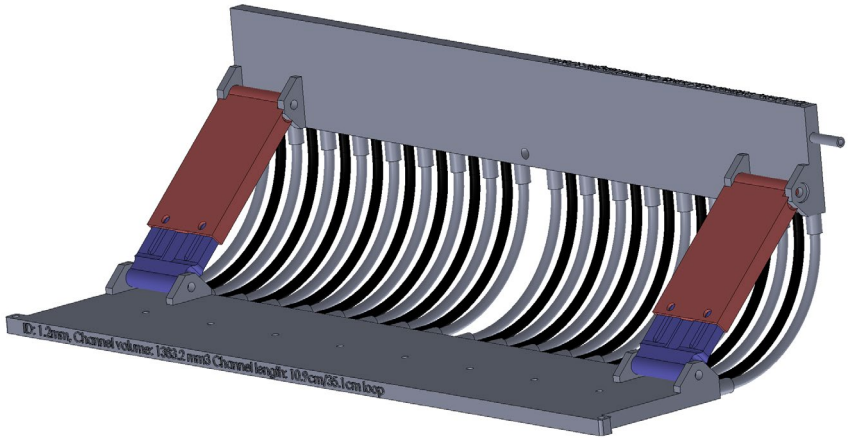


Old version of AMDROHP deployed with helical Springs



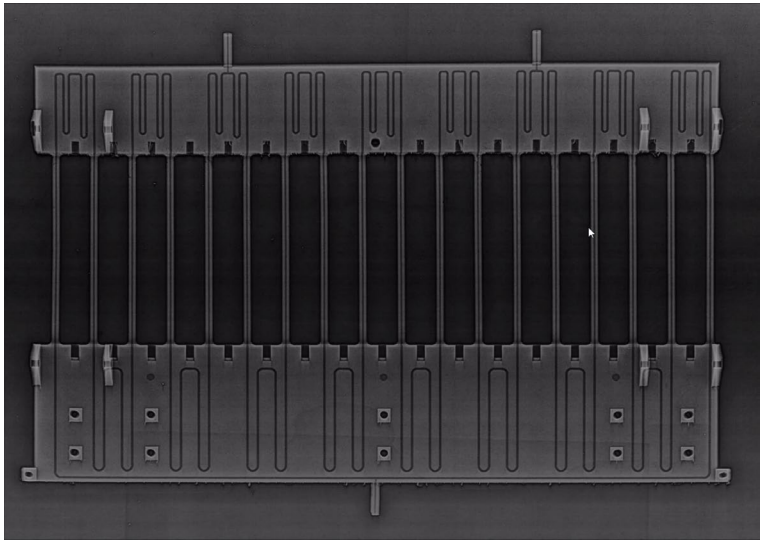
Different heat pipe shapes were explored for the compliant deployment

Shape Memory Alloy Deployment

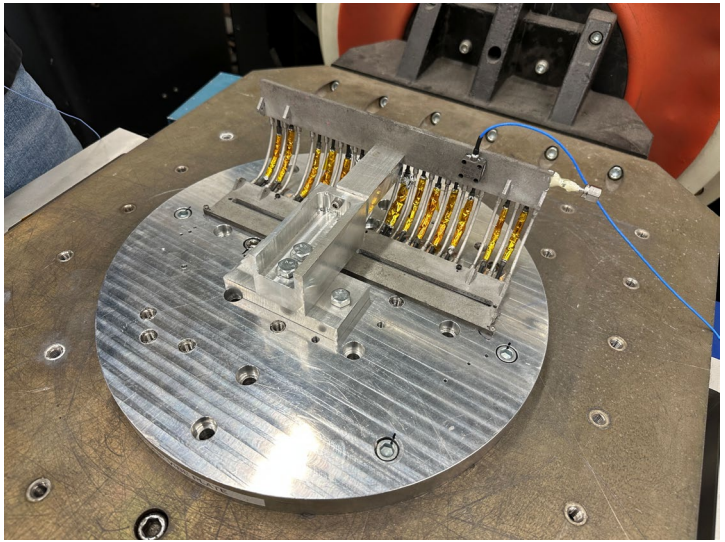


Current radiator design deployed using nitinol, a shape memory alloy

AMDROHP Design



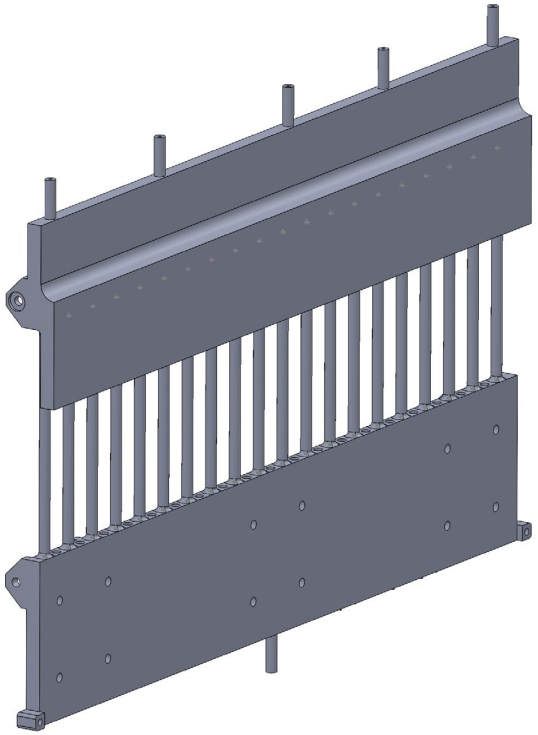
X-Ray of AMDROHP radiator showing the channels that will contain working fluid



AMDROHP test article undergoing a vibrations test at the Cal Poly Vibrations Lab

Next Steps

- Revise radiator to meet project thermal requirements using larger condenser plate
- Finalize radiator design
- Construct CubeSat using 2 flight-ready radiators
- Launch ready in early 2027



Newest version of the radiator with an expanded condenser plate to improve conductance

Thank You!

Questions?