

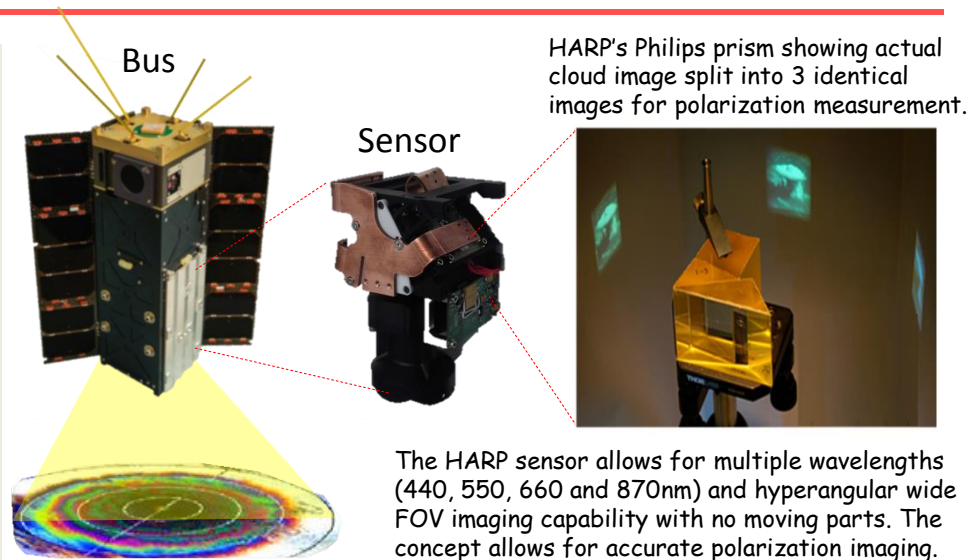
HyperAngular Rainbow Polarimeter (HARP) - CubeSat



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Objectives

- Validate the in-flight capabilities of a highly accurate and precise wide field of view hyperangular polarimeter (2-4km resolution) for characterizing aerosol and cloud properties.
- Demonstrate that CubeSat-size technology can provide science-quality multi-angle imaging data paving the way for lower cost aerosol-cloud instrument development.
- Provide opportunities for student research and engineering training in implementing a space mission.



Approach

- Migrate the aircraft rainbow polarimetric imager to a 3U CubeSat platform - instrument will fit into a 1.5U of the previously flown Space Dynamics Laboratory (SDL) Dynamic Ionosphere CubeSat Experiment (DICE) CubeSat platform.
- Use NASA Wallops Flight Facility to provide ground link to communicate with the satellite.
- Use HARP's polarimetric technology to perform hyper-angular cloud droplet measurements and aerosol observations.

Co-Is/Partners: Lorraine Remer, JCET-UMBC;
 Tim Neilsen, USU/SDL; Leroy Sparr, NASA GSFC;
 Mark Schoeberl, Science and Technology Corp.

Key Milestones

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| • Requirements Review | 10/13 |
| • Camera electronics engineering unit test complete | 04/14 |
| • Complete instrument EDU | 03/15 |
| • Instrument environmental testing | 05/15 |
| • Complete Instrument Flight Unit | 05/15 |
| • Observatory integration | 09/15 |
| • Flight-ready spacecraft delivered | 02/16 |
| • Mission Readiness Review | L-6 mth |
| • Target Launch Date (NASA CubeSat Launch Initiative) | NET 2016 |
| • Verify cloud and aerosol measurements | L+6 mth |

TRL_{in} = 5 TRL_{Current} = 5