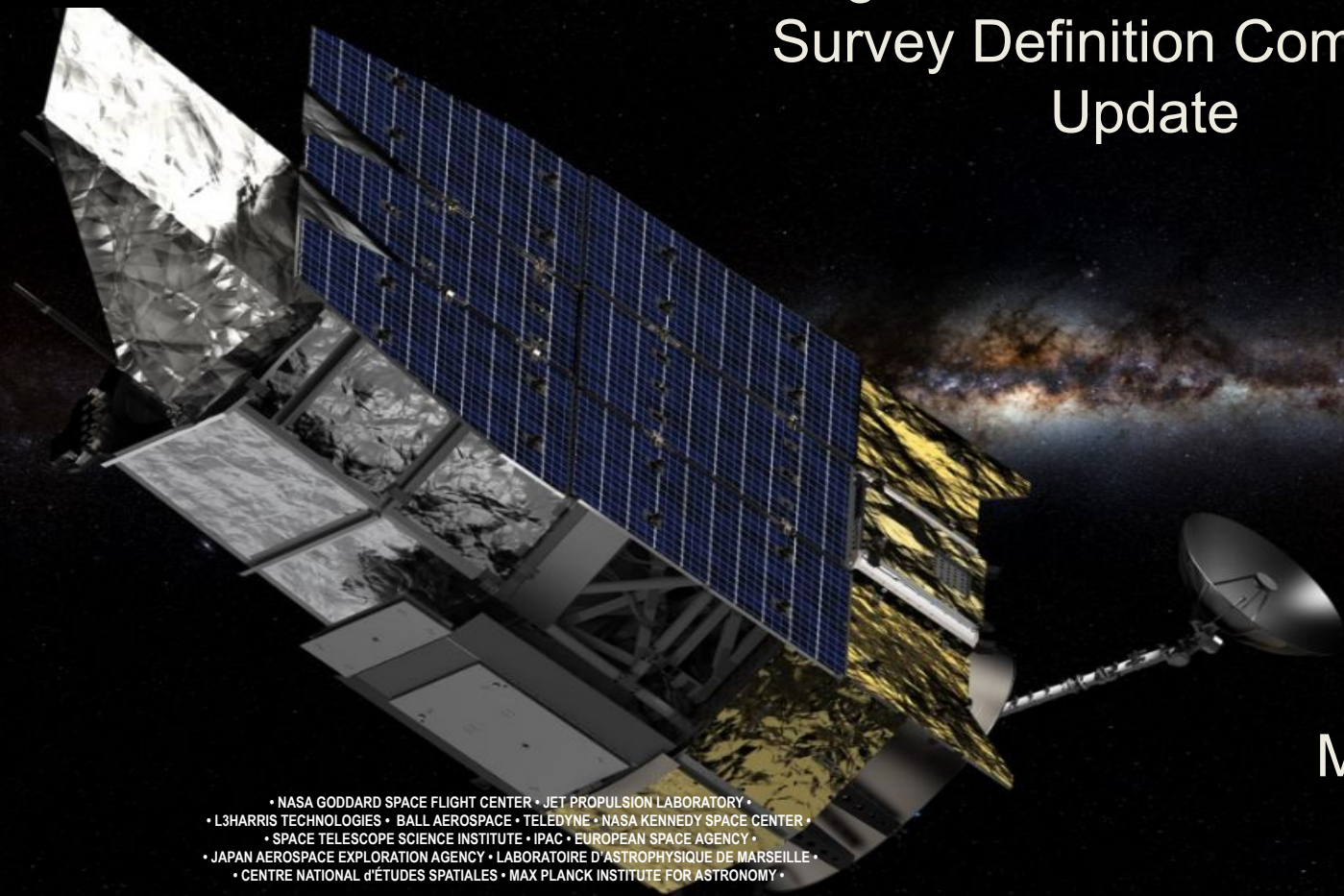


High Latitude Time Domain Survey Definition Committee Update



Masao Sako
(Penn)

• NASA GODDARD SPACE FLIGHT CENTER • JET PROPULSION LABORATORY •
• L3HARRIS TECHNOLOGIES • BALL AEROSPACE • TELEDYNE • NASA KENNEDY SPACE CENTER •
• SPACE TELESCOPE SCIENCE INSTITUTE • IPAC • EUROPEAN SPACE AGENCY •
• JAPAN AEROSPACE EXPLORATION AGENCY • LABORATOIRE D'ASTROPHYSIQUE DE MARSEILLE •
• CENTRE NATIONAL d'ETUDES SPATIALES • MAX PLANCK INSTITUTE FOR ASTRONOMY •

HLTDS Definition Committee Members



Brad Cenko
(NASA/GSFC, Co-chair)



Masao Sako
(Penn, Co-chair)



Alessandra Corsi
(Texas Tech)



Michael Fasnaugh
(Texas Tech)



Sebastian Gomez
(STScI)



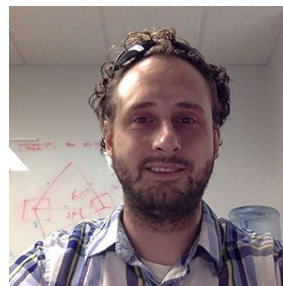
Rebekah Hounsell
(NASA/GSFC, SN PIT)



Takashi Moriya
(NAOJ)



Gordon Richards
(Drexel)



Russell Ryan
(STScI)

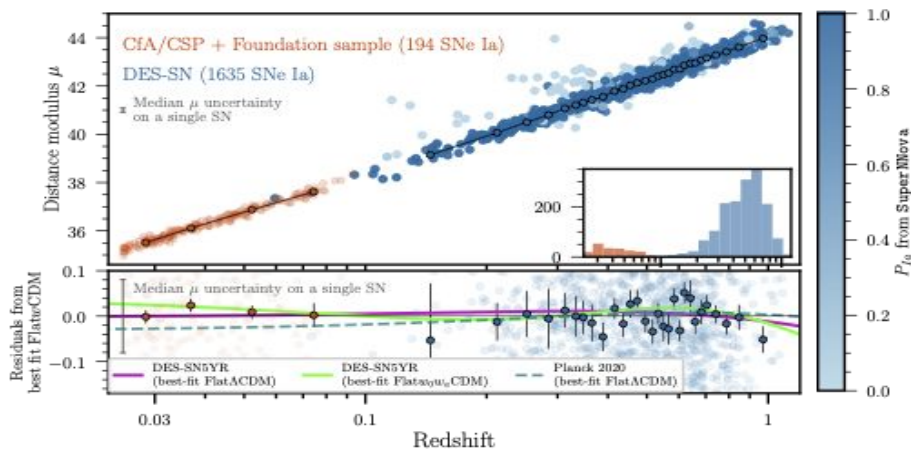


Schuyler van Dyk
(IPAC, RAPID PIT)

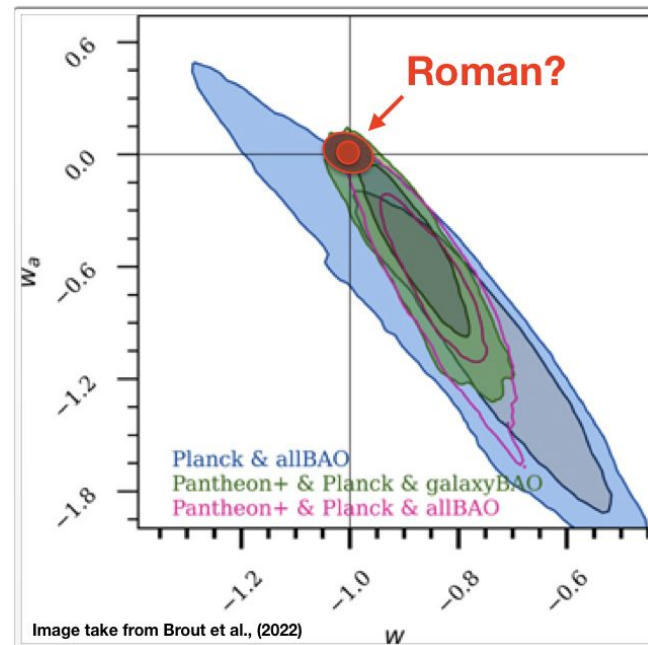


V. Ashley Villar
(Harvard)

HLTDS Science Goal: SN Ia Cosmology

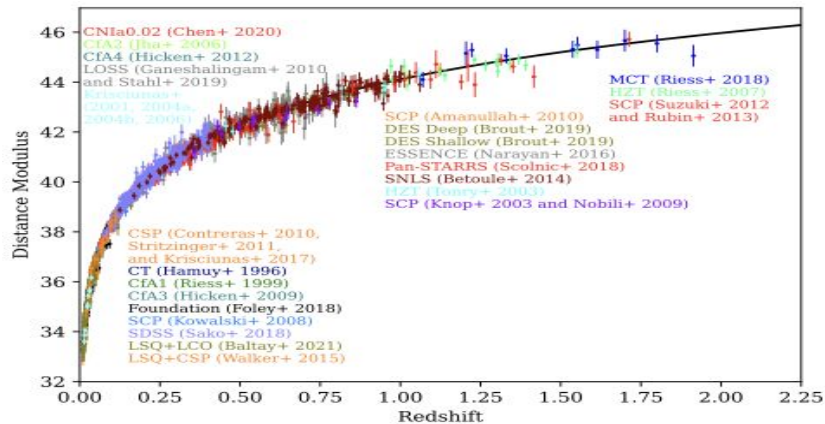


DES Collaboration 2024 (DES5YR; 1800+ SN Ia)



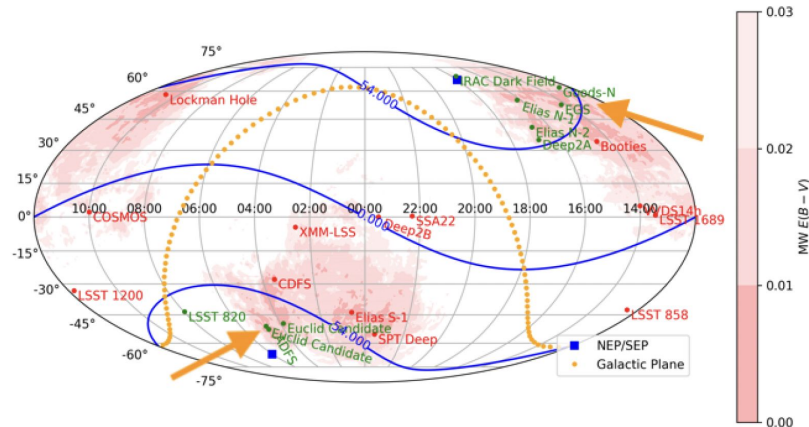
Brout et al. 2022 (Pantheon+; 1500+ SN Ia)

Rubin et al. 2023 (Union 3; 2000+ SN Ia)

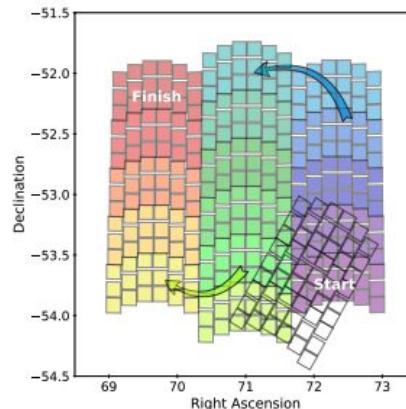
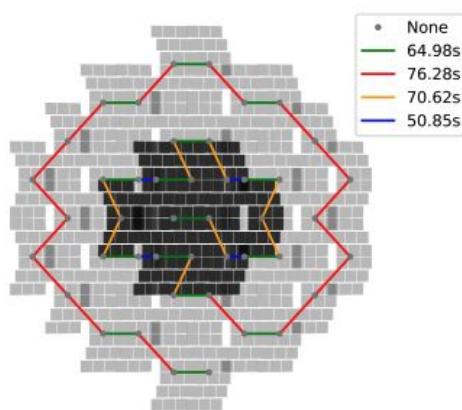
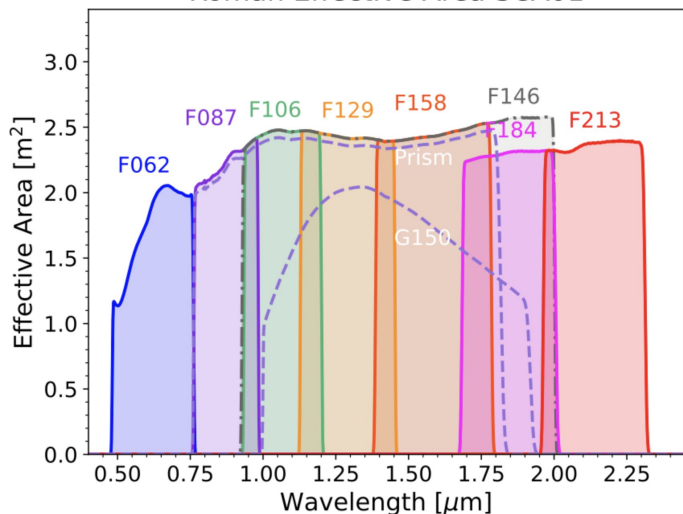


HLTDS Observing Strategy

- 6 months of observing over 2-year duration (mid mission)
- Continuous viewing zones
- Low Galactic extinction
- Imaging and spectroscopy



Roman Effective Area SCA01





An Initial Design: 75% Imaging + 25% Spec.

Mode	Tier	Target z^*	Filters	Exp. Time	Single Exposure limiting Mag	Co-added Limiting Mag	No. Pointings	Area (deg ²)	Time/Visit (hrs)	Total SN Ia
Imaging	Wide	1	RZYJ	160; 100; 100; 100	26.4; 25.6; 25.5; 25.4	29.0; 28.2; 28.1; 28.0	68	19.04	14.0	8804
Imaging	Deep	1.7	YJHF	300; 300; 300; 900	26.7; 26.6; 26.5; 26.7	29.3; 29.2; 29.1; 29.3	15	4.2	8.5	3520
Subtotal									22.5	12324
Spec.	Wide	1.0	Prism	900			12	3.36	3.2	831
Spec.	Deep	1.5	Prism	3600			4	1.12	4.1	625
Subtotal									7.3	1483

Taken from Rose et. al, 2021

30-hour “visits” every 5 days



Another Initial Design: 25% Imaging + 75% Spec.

Mode	Tier	Target z*	Filters	Exp. Time	No. Pointings	Area (deg ²)	Time/Visit (hrs)	Total SN Ia
Imaging	Wide	1	RZYJ	160; 100; 100; 100	19	5.32	3.9	2460
Imaging	Deep	1.7	YJHF	300; 300; 300; 900	6	1.68	3.5	1408
Subtotal							7.4	3868
Spec.	Wide	1.0	Prism	900	19	5.32	5.1	2460
Spec.	Deep	1.5	Prism	3600	6	1.68	17.5	1408
Subtotal							22.6	3868

Taken from Rose et. al, 2021

HLTDS Committee Activities

- Areas of Investigation
 - Sub-committees studying various trade offs:
 - Imaging vs spectroscopy
 - Supernova spectroscopic standardization, redshifts, classification, AGN monitoring
 - External resources (e.g. Subaru PFS)
 - Cadence, filters, exposure times
 - Target SN Ia redshifts, light curve quality, AGN science
 - Coordination with other concurrent time-domain surveys (e.g., Rubin, Euclid, Subaru, DECam).
 - Plans for reference images and possible early pilot survey.

- Timeline
 - **July** - Report investigation results to community for feedback and iteration
 - **August** - Committees' preliminary finding/status update
 - **August - September** - Refine trade investigations and develop nominal implementation plans
 - **October** - Report investigation results to community for final input
 - **November** - Final report to Roman Project

HLTDS-Related Breakout / Splinter Sessions

- Wednesday
 - **10:00am - 12:00pm** - RAPID PIT
 - **11:30am - 12:30pm** - SN PIT
Public All Hands Meeting

- Thursday
 - **9:00 - 10:00am** - Joint HLTDS + HLWAS Committees
 - **10:00 - 11:30am** - HLTDS Committee
 - **4:00 - 5:00 pm** - SN PIT Simulations Hack Session

- All times in PDT; sessions in Keith Spalding Building Room 410W

