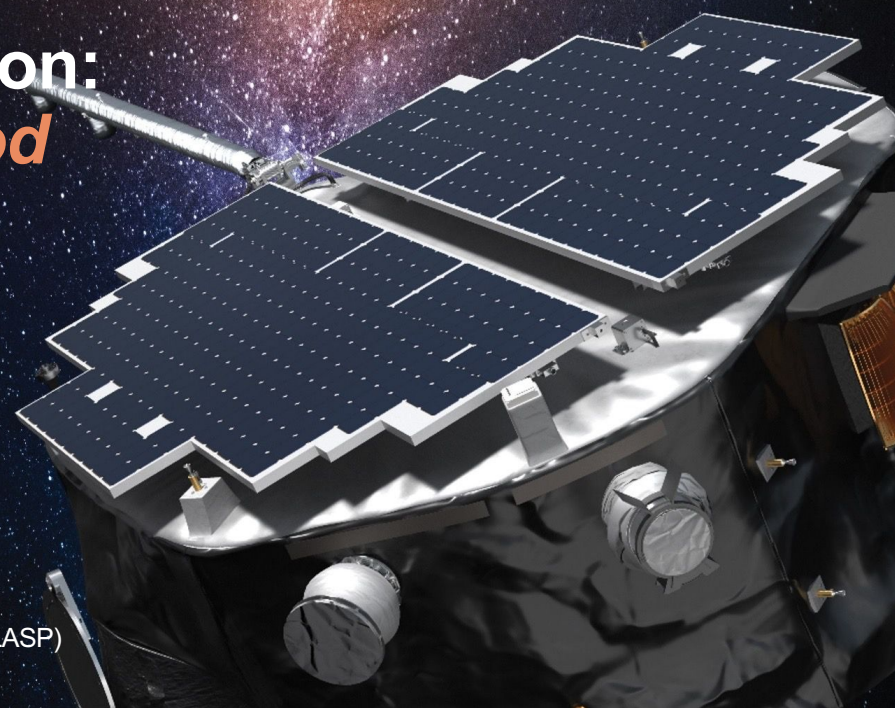




Interstellar Mapping and Acceleration Probe (IMAP) mission: *Exploring our solar neighborhood*

Interstellar Dust Experiment (IDEX)

Dusty Universe 2025



Mihaly Horanyi –
IIDEX Instrument Lead

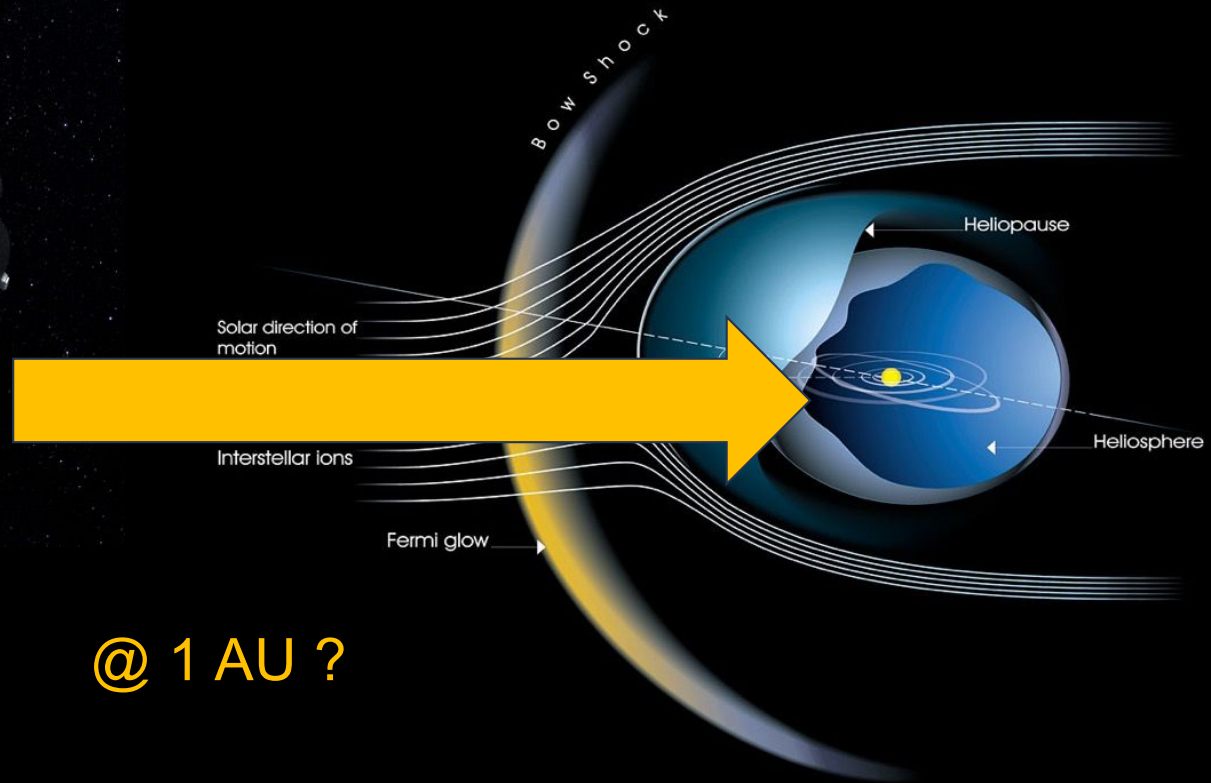
University of Colorado, Boulder
Laboratory for Atmospheric and Space Physics (LASP)



IMAP: *Exploring our solar neighborhood*

Heliosphere – Interstellar Medium

IMAP



IMAP Science

- 1) Composition and properties of the local interstellar medium.
- 2) The boundary region where the solar wind interacts with the interstellar medium.
- 3) Interactions between the Sun's magnetic field and the interstellar medium.
- 4) Injection and acceleration processes near the Sun and within the heliosphere.





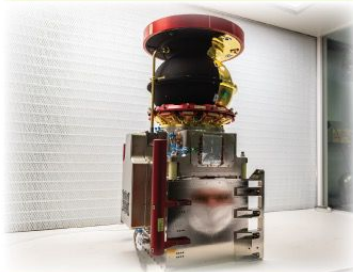
INSTRUMENT SUITE

SWAPI

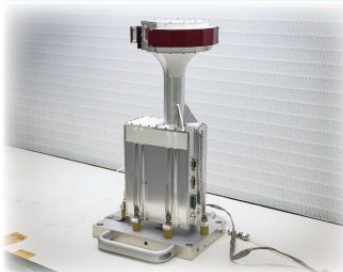


Solar Wind, Pickup, Suprathermal, and Energetic Ions;
Energetic Electrons

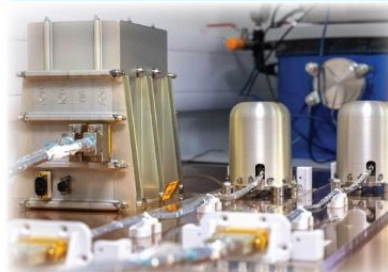
CoDICE



HIT

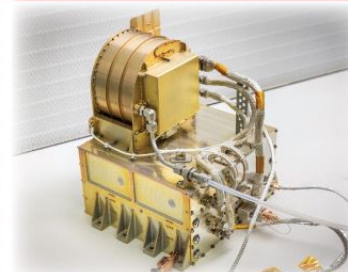


MAG



Magnetic Fields

SWE



Solar Wind Electrons

IMAP-Lo



IMAP-Hi

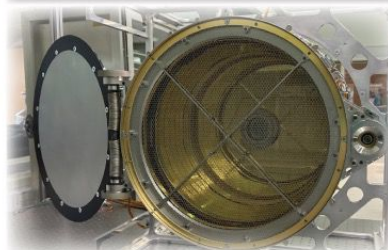


IMAP-Ultra



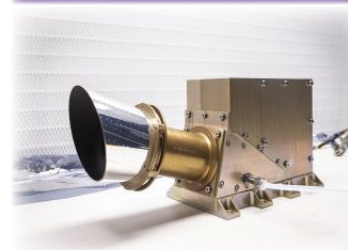
Energetic Neutral Atoms (Increasing Energy);
Interstellar Neutral Atoms

IDEX



Dust

GLOWS



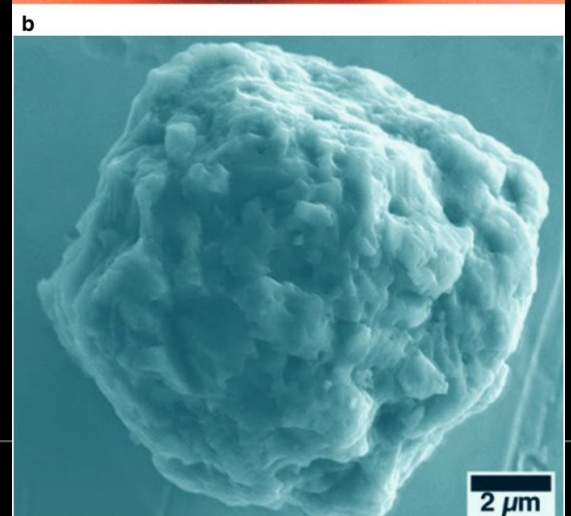
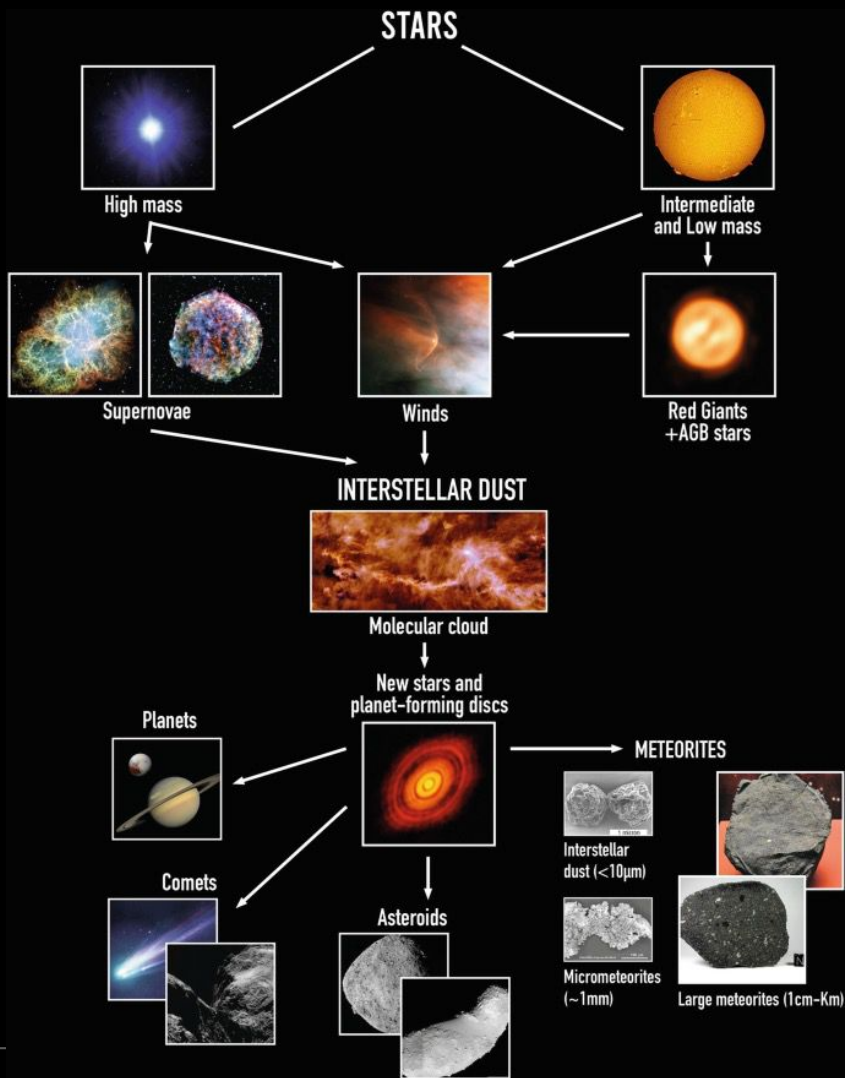
UV

Space Weather: I-ALiRT

IMAP/IDEX Science

- 1) **Composition and properties of the local interstellar medium.**
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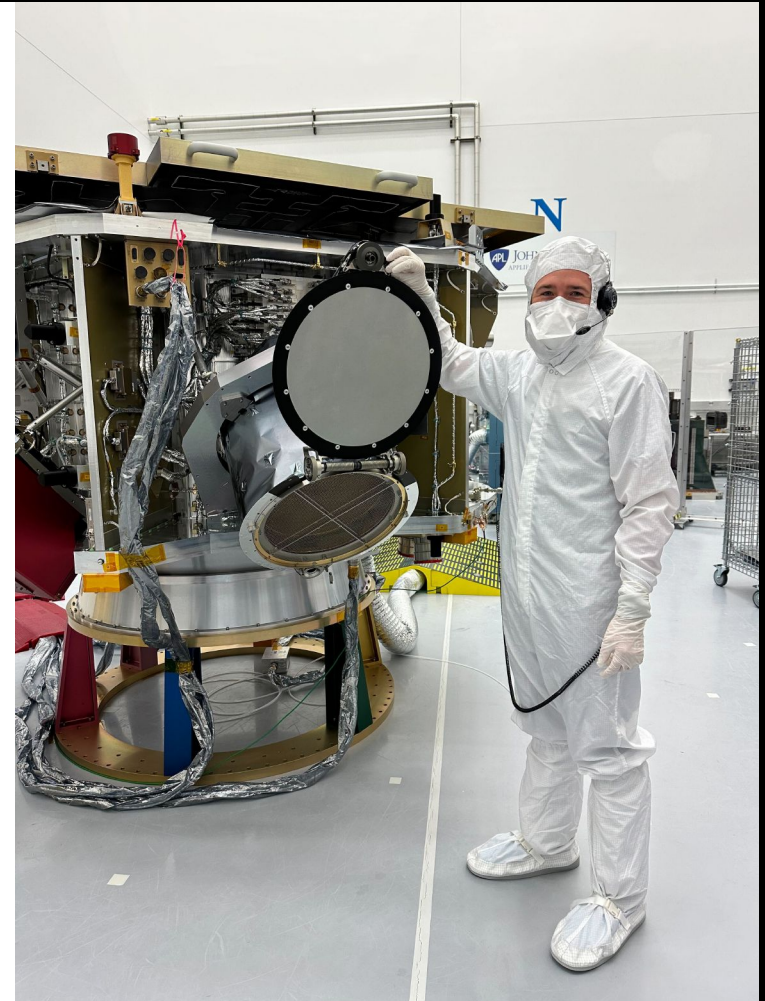
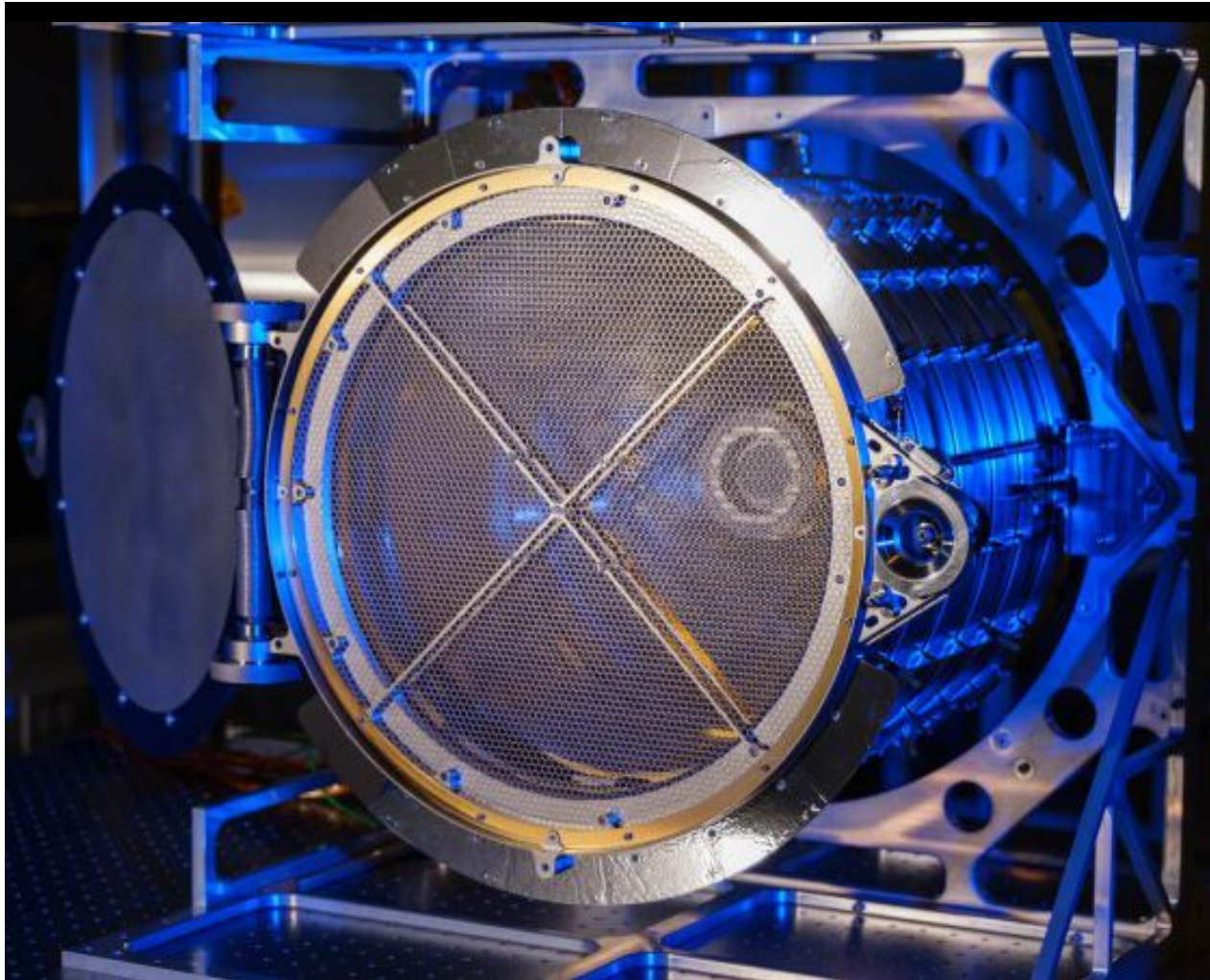




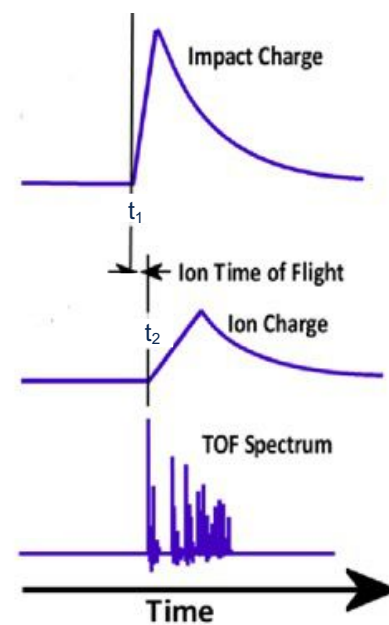
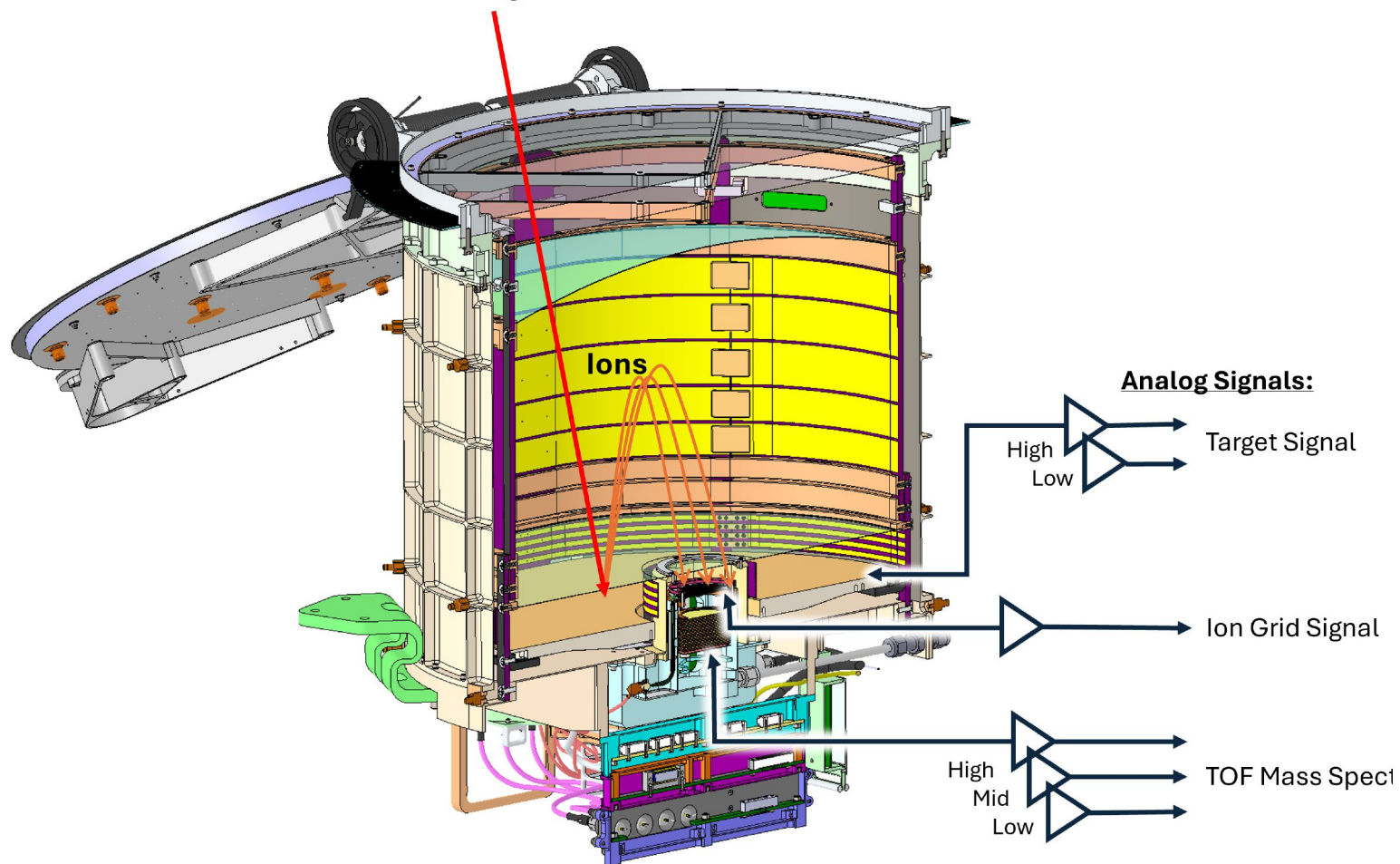
IMAP/IDEX Science

- 1) What is the size distribution and composition of interstellar dust (ISD)?
- 2) Is ISD destroyed and created throughout the ISM, or does it carry the imprint of its origins?
- 3) Do cometary dust grains all show signs of thermal or aqueous processing?
- 4) Do organics share a common source or indicate distinct reservoirs?



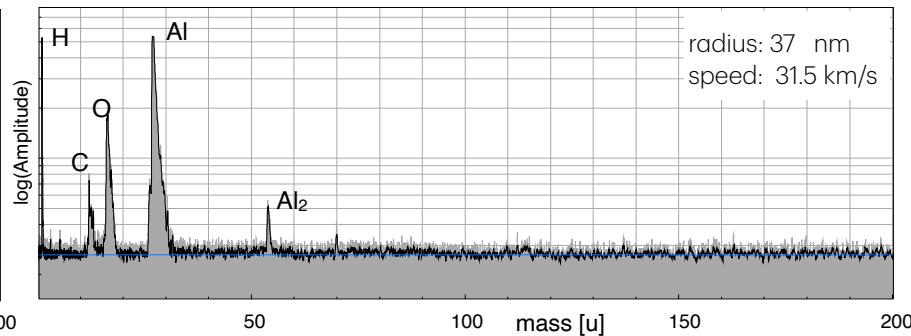
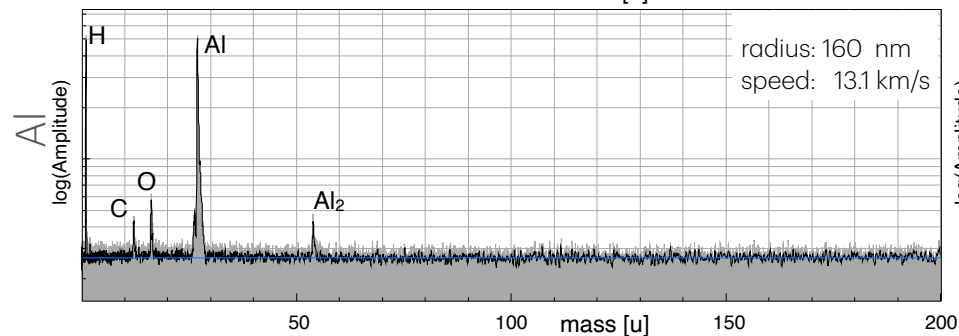
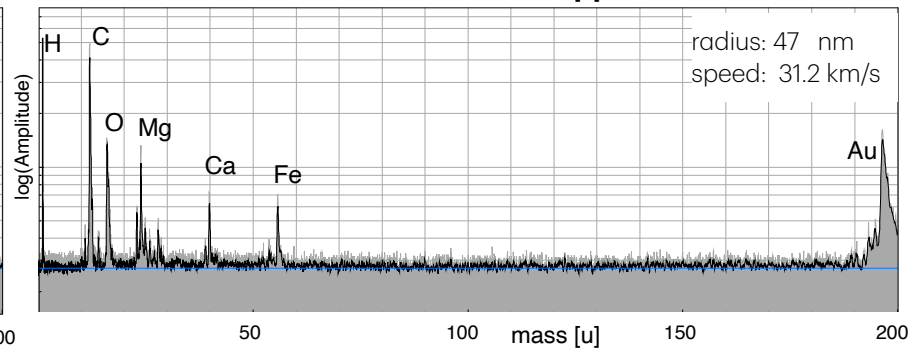
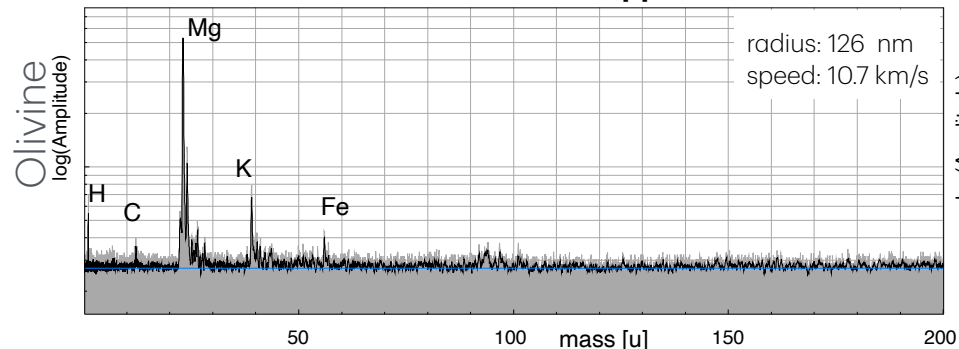
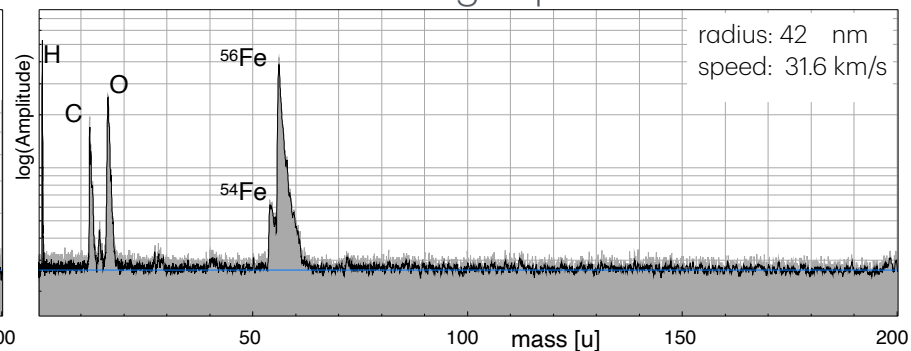
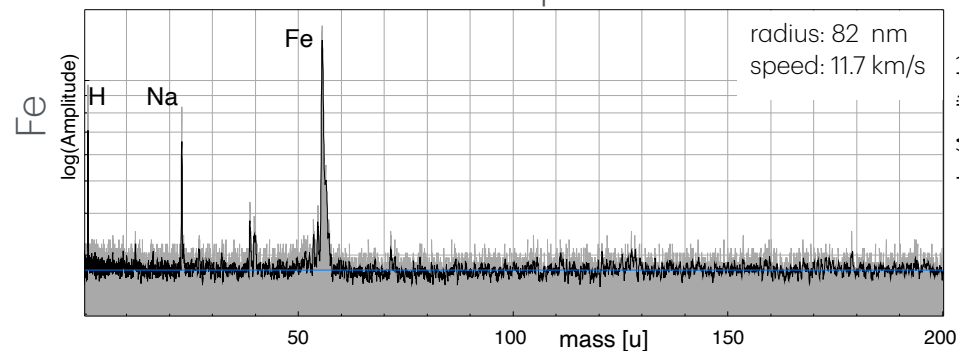


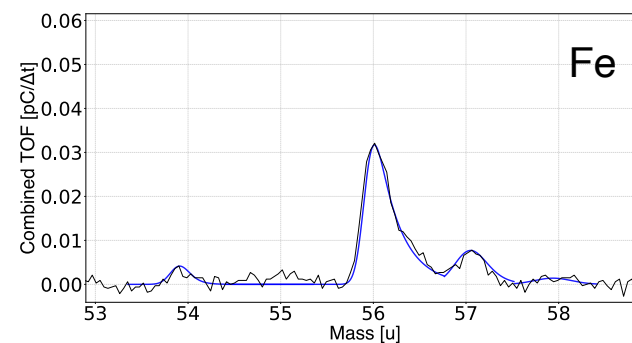
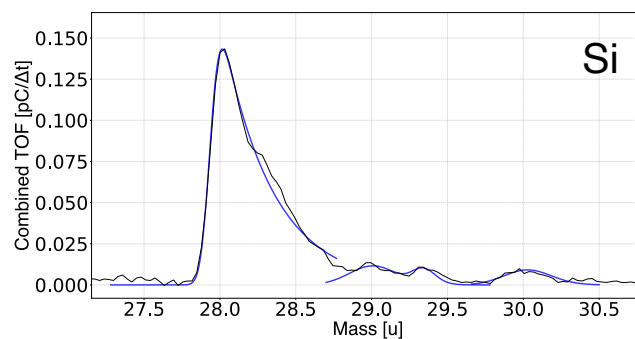
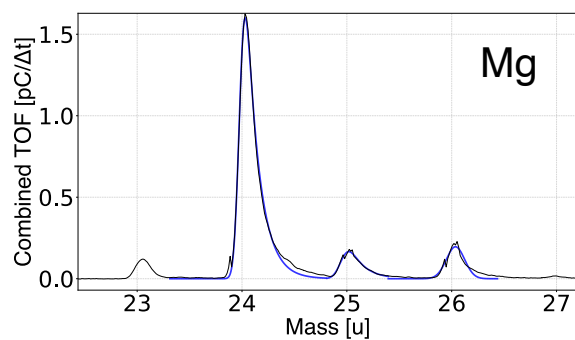
Incoming Dust



Low speed

High speed





Isotope	Abundance [%]	Reference [%]
$^{24,25,26}\text{Mg}$	80 ± 6 ; 10 ± 2 ; 10 ± 3	78.99; 10.00; 11.01
$^{28,29,30}\text{Si}$	89 ± 4 ; 6 ± 1 ; 5 ± 2	92.23; 4.67; 3.10
$^{54,56,57,58}\text{Fe}$	4 ± 2 ; 94 ± 7 ; 2 ± 1 ; 0.2 ± 0.2	5.8; 91.75; 2.12; 0.28



September 24, 2025, at 7:30 a.m. EDT.

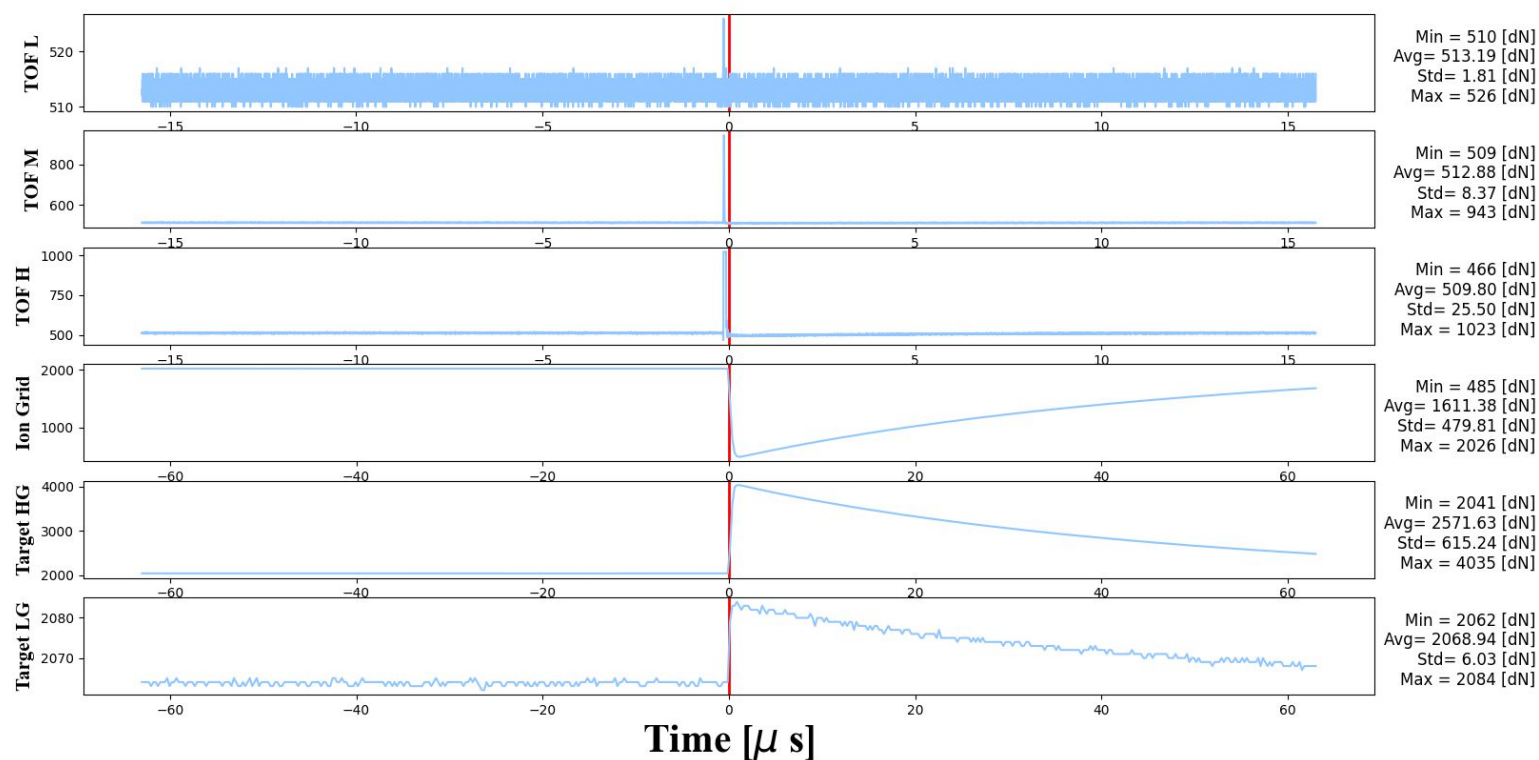


IMAP: *Exploring our solar neighborhood*

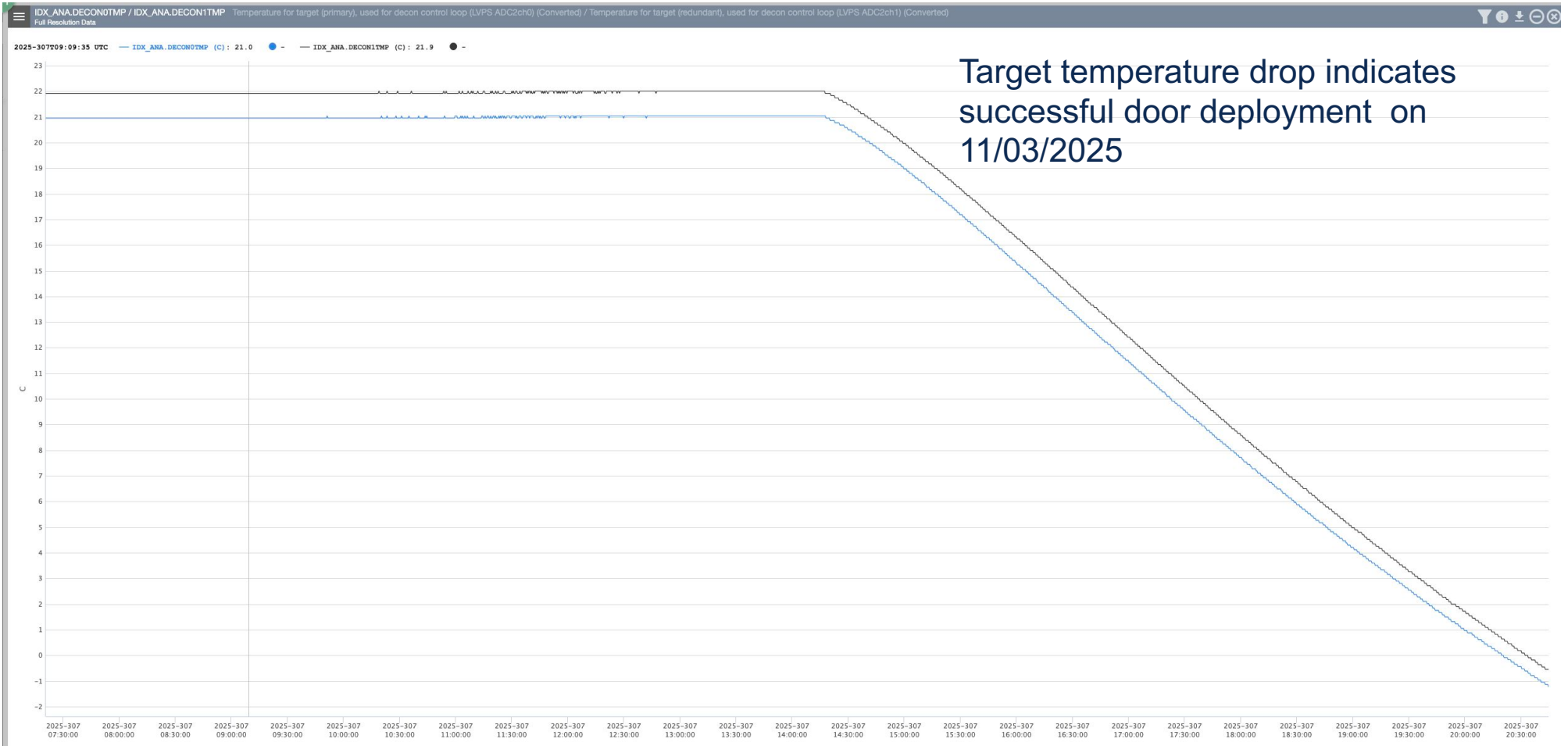
Data Review

Pulser Data from IDEX Low Voltage Checkout: looks nominal!

IDX_SCI_10_01_25.bin Event 15



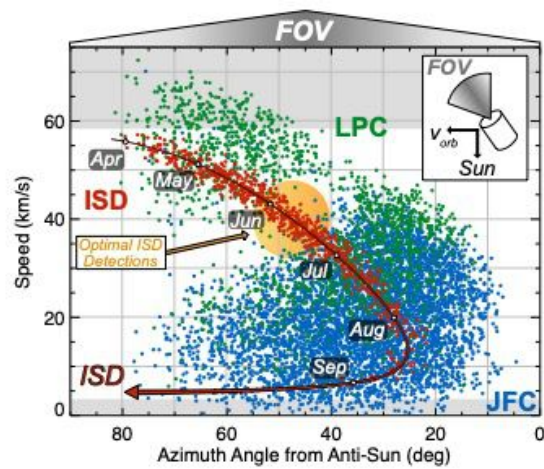
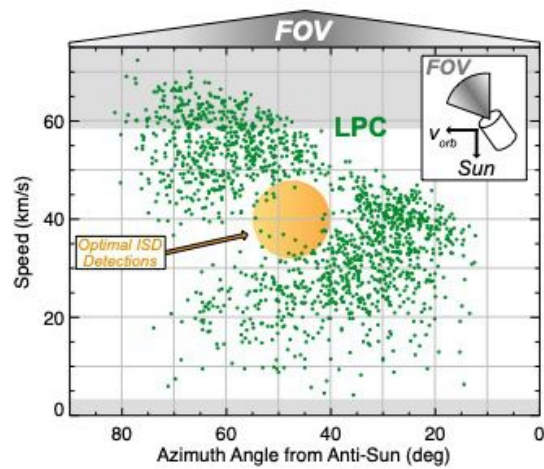
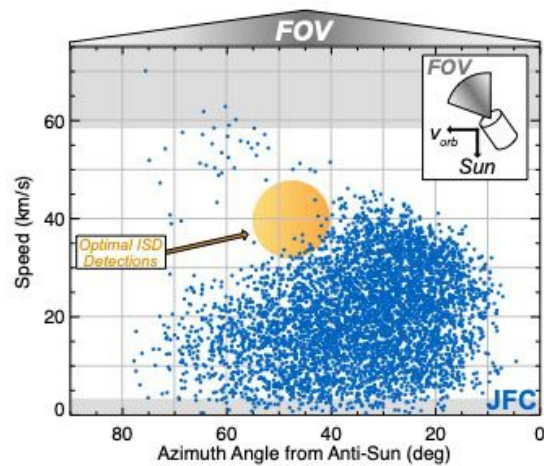
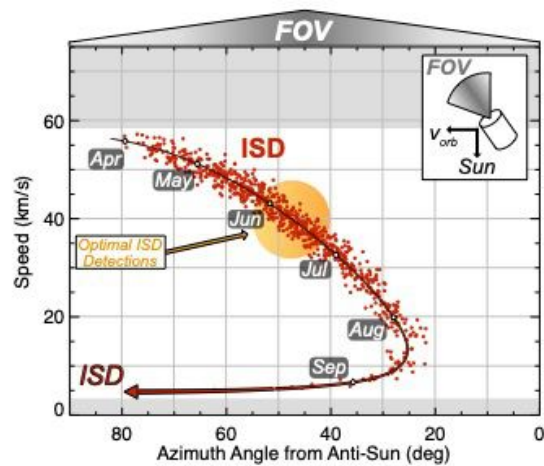
Data Review



IDEX Commissioning Timeline

Completed	Date	BOT (UTC)	BOT (MT)	Activity Name	Activity
Yes!	Wed 10/01/25	14:40:00	08:40:00	IDX.001 (60m)	IDEX Aliveness
Yes!	Sun 10/18/25	9:45:00	3:45:00	TCM-3 Power off & Power ON	Trajectory Correction Maneuver
11/2/25 Daylight Savings Ends (UTC – 7Hrs = MT)					
Yes!	Mon 11/3/25	13:30:00	06:30:00	IDX.002 (3h)	IDEX Cover Deployment
Yes!	Tues 11/4/25	13:25:00	06:25:00	IDX.003 (2h) & PT	IDEX Instrument Checkout (CTDB after activities are over)
In Progress	Wed 11/5/25	13:20:00	6:20:00	IDX.006 (7h)	IDEX Decontamination
	Thurs 11/6/25	13:30:00	6:30:00	IDX.004 (4h) & IDX.005 (2h)	IDEX HVPS Checkout & Full Science Checkout
	TBD	TBD	TBD	IDX.007 (2h)	IDEX Repeat Full Science Checkout (run IDX.005 again)
	Fri 11/21/25	13:10:00	6:10:00	IDX.008 (1h), IDX.009 (30m)	IDX Re-run Commissioning Transmits, IDEX Erase AIDs from Commissioning
	Fri 11/21/25	18:20:00	11:20:00	IDX.010 (1.5h), IDX.011 (30m)	IDEX Update Limits and SCSs, IDEX Update Flight Parameter Table
	Sun 11/23/25	18:20:00	11:20:00	TCM-4 Power off & Power On	22:15z SWF via TT, 00:45z Power on Instruments
	Mon 12/9/25			End of Commissioning	
	Tues 12/9/25			Start of Science Performance Demo	When IDEX Science Data will start
	Sat 12/20/25	14:20:00	7:20:00	TCM-5 Power off & Power On	Power on start time 18:05
	1/4/2026			End of Science Performance Demo	IDEX will be powered off until LOI
	1/9/2026 to 1/10/2026			LOI	(LOI Correction Maneuver on 1/16-1/17)

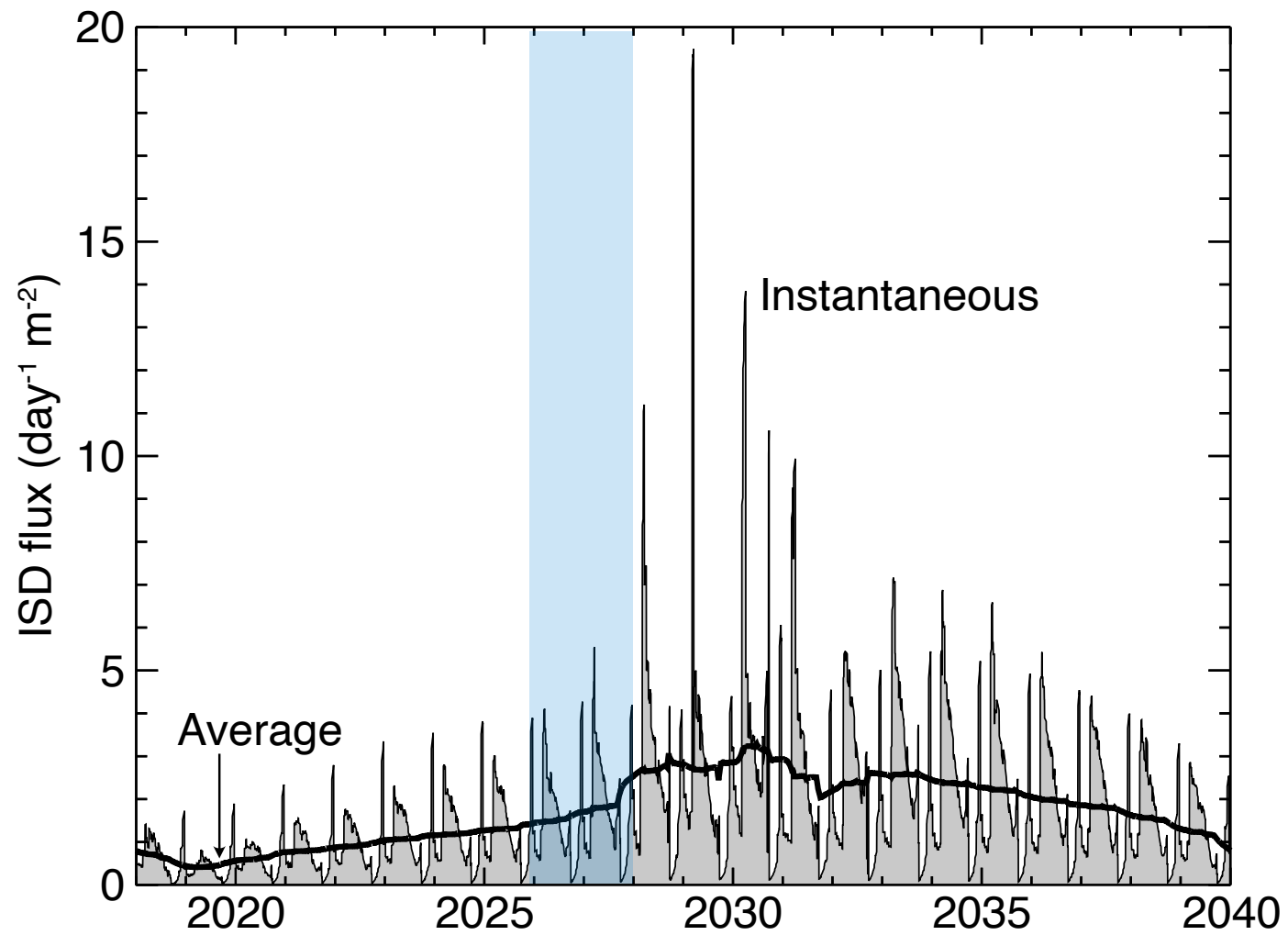




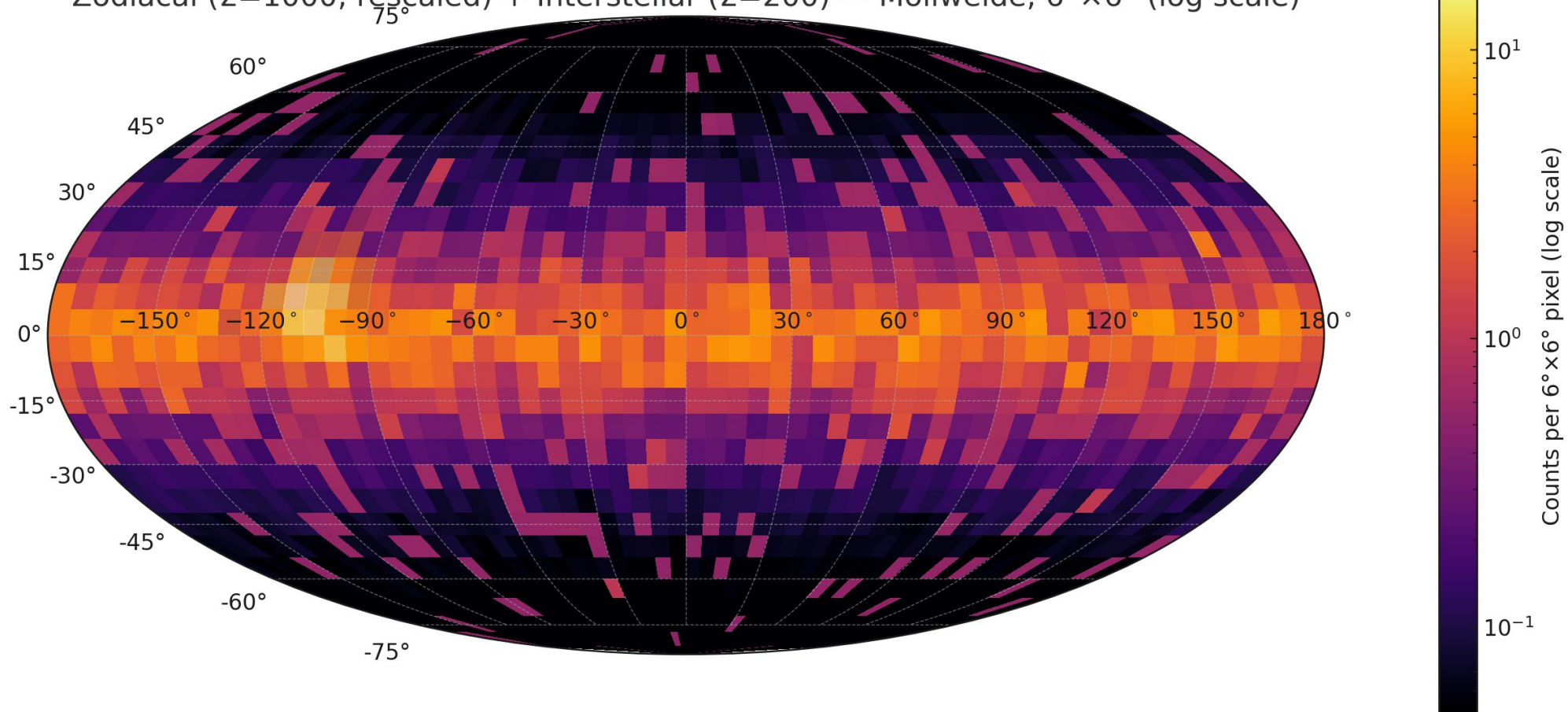
IDEX predict:

Source	# Samples
Jupiter Family Comets (JFC)	1000
Halley Type Comets (HTC)	100
Oort Cloud Comets (OTC)	100
Asteroids (AST)	50
Interstellar Dust (ISD)	200





Zodiacal ($\Sigma=1000$, rescaled) + Interstellar ($\Sigma=200$) — Mollweide, $6^\circ \times 6^\circ$ (log scale)





IMAP

